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Enhancing knowledge and skill amongst dementia care staff using the updated ‘Behavioural Education and Training Support Inventory’

Katelynn Viau

Behavioural Supports Ontario Provincial Coordinating Office

Background/Objectives: In recent years, the number of available dementia education programs geared towards staff has grown considerably. While employers have a legal responsibility to assure that they are equipping care providers with appropriate education to ensure their safety and promote quality patient/resident care, it has become increasingly difficult to select reputable programs that will impart effective knowledge to practice across a variety of settings. The objective of the Behavioural Education and Training Support Inventory (BETSI) is to strengthen the capacity of planners and leaders to choose best practice education programs to enhance knowledge and skill amongst their staff.

Methods: The original BETSI was created in 2012 by Behavioural Supports Ontario in collaboration with behavioural education experts. In July 2017, a working group sought to update the BETSI due to the aforementioned growth in the number of available programs and the need to remove programs no longer offered. In the updated version, we also sought to include programs building capacity in caring for individuals with other complex mental health conditions alongside dementia, including delirium, depression and substance use. The BETSI was updated in consultation with approximately 100 previous BETSI users who responded to a survey which informed the creation of a new BETSI application form. Applications received (n=35) were evaluated by the BETSI Working Group based on a set of evaluation criteria. Those meeting the set criteria are included in the BETSI’s list of recommended clinical training programs. Other recommended programs not meeting all criteria are listed in ‘Additional Curricula’.

Results: The updated BETSI was released in March 2019. It includes methods by which organizations can assess their education needs; considerations for multiple types of capacity

building; a core competency matrix which outlines each program’s target population and core competencies; and a program inventory. The program inventory is separated by core clinical training programs and other additional curricula to consider. Each program is described, including information such as the goals and objectives of each program; target learner; method of delivery; length of training; curriculum update cycle; program evaluation details; methods by which the program elicits practice change; quality assurance for trainer(s); cost; and contact details. Following the release of the paper-version of the document, the BETSI Working Group is also actively creating an electronic database and associated algorithms to further enhance the decision-making process for staff education about dementia and other complex conditions.

Conclusion: Those attending the poster viewing/presentation will be provided with an overview of the robust process undertaken to update the tool along with a variety of examples of how the BETSI may facilitate decision-making pertaining to staff education about dementia and other complex conditions across sectors including long term care, community and hospital. Attendees will also be provided with multiple methods upon which the BETSI can be accessed and provide opportunity to engage in conversation regarding further enhancements to the BETSI. This poster/presentation will also serve as an excellent opportunity to disseminate the new BETSI to previous users across the country.

WIZARD to support caregivers in maintaining elderly’s home independence: usability tests

Amel Yaddaden ¹, Maxime Lussier ¹, Nathalie Bier ²

¹ Université de Montréal, CRIUGM

² Université de Montréal

Background/Objectives: Assistive and home-monitoring technologies that support home care for older people have greatly expanded over the last 10 years. Usability testing is a key step in the development and implementation of such technologies. WIZARD is an assistive and home-monitoring

technology run on a tablet that allows caregivers to express a service within a taxonomy of target activities. The aim of this study is to measure the usability of this technology to document its implementation in clinical setting.

Methods: To date, 3 occupational therapists with at least 3 years' experience in psycho-geriatrics have tested WIZARD. Clinical vignettes describing fictitious patient situations were presented and the clinicians had to use WIZARD's features to respond to each situation. Each session lasted 1 hour and was recorded. Participant were called to talk-aloud during the experimentation and usability questionnaires (AttrackDiff UEQ and SUS) were administered at the end. A preliminary statistical and qualitative analysis of the data was conducted by a research assistant using comparison tables.

Results: The data collected to date has good usability potential. The qualitative data reveal an ease of use after several trials perceived by the participants. A factor raised by all participants was the difficulty of relying on intuition to use the various parameters of the application.

Conclusion: The favorable potential revealed by the preliminary analysis of this study must be confirmed by further analysis as well as a higher number of participants, which is being processed.

Geriatric dementia care at Ontario Shores: A new model of care

*Julie Earle, Andra Duff-Woskosky
Ontario Shores Centre for Mental Health Sciences*

Background/Objectives: Ontario Shores Centre for Mental Health Sciences has taken great strides to create a service delivery model that aligns with the direction of the Ontario Senior's Strategy. We have embraced and embedded the Quality Standards for Behavioural Symptoms of Dementia - care for patients in hospitals and residents in long term care homes published by Health Quality Ontario (HQO), 2016. Through modification of our care environment, our model of care and the education provided to our staff and community partners we have improved the quality of inpatient care and reduced overall length of stay and patient flow through the unit.

Methods: Care Environment An evidence based, large scale renovation was done to improve the environment optimally for individuals with dementia. Model of Care Our Electronic Medical Record (EMR) was augmented to include documentation and data collection capability for the 14 quality indicators of the Health Quality of Ontario Dementia Standards. A nurse practitioner (NP) model was implemented to ensure comprehensive, geriatric focused care. The NP works to full scope as most responsible provider (MRP) in consultation with geriatric psychiatry. To create smooth and timely transition

back to long term care, a 59 day length of stay was implemented. This was combined with an integrated care pathway including frequent, scheduled meetings with the entire team. Discharge planning occurs proactively and involves the referral source and community supports. Once discharged into the community, there is continued collaboration through outpatient services, which provides clinical consultation and staff support and education.

Results: Patients receive comprehensive assessment on admission allowing for a more holistic approach to care. There has been a 100% increase in the use of non-pharmacological interventions for treatment of agitation/aggression. ALC rates have decreased by 44%. Length of stay has decreased, with over 80% of patients being discharged within the 59 day time frame. Readmission rate is less than 5%. Patient flow through the unit has doubled since the implementation of the model of care. Overall, patient and family satisfaction has increased and significant gains in length of stay targets and flow optimization has improved.

Conclusion: Through modification of our care environment, our model of care and the education provided to our staff and community partners we have improved the quality of inpatient care and reduced overall length of stay and patient flow through the unit. We have created a centre of excellence, embracing the HQO Dementia Standards. Further, we have been able to create collaborative relationships between the inpatient and community settings, with open communication and comprehensive support and education for the long term care facilities. This collaboration provides a comprehensive and sustainable approach to dementia care for all.

Towards co-designing of a clinical demonstration unit: Staff and family perspectives on improving quality of life and recovery on a geriatric dementia unit using technology

Andra Duff-Woskosky¹, Wally Bartfay², Chaitali Desai³, Karen Zavitz², Julie Earle¹, Sheri Horsburgh¹, Brenda Gamble²

¹ Ontario Shores Centre for Mental Health Sciences

² Ontario Tech University

³ Sunnybrook Health Sciences Centre

Background/Objectives: Together, Ontario Shores Centre for Mental Health Sciences and Ontario Tech University are creating a space of innovation in front line care. The Clinical Demonstration Unit (CDU) will transform a Geriatric Dementia Unit (GDU) within a tertiary mental health context using co-design to improve patient quality of life and recovery and allow clinicians to practice to their full scope using technology.

Methods: Staff (n=12) and family focus groups and interviews (n=10) were conducted as part of a needs assessment to identify

priority areas (Phase 1). The top themes emerging as areas of need were Communication & Reducing Responsive Behaviours, Physical Environment, and Activities and Stimulation. Themes were then utilized in an Idea Jam (Phase 2), including university researchers (8), students (3), interprofessional staff (4), and families (2), to co-explore potential technology-based solutions in these priority areas. A total of 373 ideas were generated during the jam session. These ideas were stratified into three themes; communication and responsive behaviours, physical environment, and activities/ stimulation. The solutions obtained via the Idea Jam were prioritized according to idea prevalence, ability to address priority areas, stakeholders impacted and current resources/practice. Technology-based solutions identified through the prioritization process and implementation strategies will be shared.

Results: The CDU project team has created a framework to guide all of our efforts. Three arms of work were the product of the idea jam. 1. Research - A joint call for research proposals went out in July 2019. In October, the time of this conference we will be able to reveal the selected projects. Research projects are to focus on the use of virtual reality, artificial intelligence and electronic games in the care for individuals with dementia. 2. Quality Improvement - These projects will begin in August 2019. Topics include the use of 10,000 LUX lights in promoting sleep in individuals with dementia and the use of music therapy during personal care in decreasing responsive behaviours. 3. Student Experiential Learning - will involve Ontario Tech students implementing and researching innovative technologies on the CDU. This will be launched in September 2019.

Conclusion: This is a very exciting partnership between a tertiary mental health hospital and an academic institution. Together we engage patient/family and community partners using co-design and engagement principles. We are so excited at the opportunity to share the early stages of our work and our accomplishments to date.

Primary Care Collaborative Memory Clinics: Outcomes in rural, remote, and underserved communities in Ontario.

Linda Lee ¹, Loretta M. Hillier ², Tejal Patel ³, Frank Molnar ⁴, Jo-Anne Clarke ⁵, Michael Borrie ⁶

¹ Department of Family Medicine, McMaster University

² Geriatric Education and Research in Aging Sciences (GERAS) Centre

³ School of Pharmacy, University of Waterloo

⁴ Department of Geriatric Medicine, University of Ottawa

⁵ Department of Geriatric Medicine, Northern Ontario School of Medicine

⁶ Schulich School of Medicine & Dentistry, Western University

Background/Objectives: The Primary Care Collaborative Memory Clinics (PCCMC) are family physician-led teams

of interprofessional health care providers, which provide synchronous team-based comprehensive assessment and management. There are 110 PCCMCs across Ontario. PCCMCs triage only the most complex of cases for referral to specialists while providing high quality comprehensive interprofessional care for the rest. PCCMCs are created following completion of an accredited 5-day training/ mentorship program for all team members. This presentation describes this care model in terms of its multi-disciplinary team approach, training and skill building, efficient, collaborative care processes, and comprehensive person-centred care, and provides evidence of its effectiveness.

Methods: This study was implemented in 17 consecutively-trained PCCMCs located in rural, remote and underserved settings. All PCCMC referrals were tracked for nine months, collecting data on number of patients referred, number assessed, wait-time to assessment, diagnosis, and referrals to specialists. Pre-and six month post-training surveys measured (5-point rating scales) ability to assess and manage dementia and ability to have a positive impact on patient quality of life; post-training survey respondents rated changes to the quality of dementia care (much/ worsened, no change, improved/ much improved). Patients and caregivers were surveyed to assess their satisfaction with the timeliness of access to assessment; they rated their level of agreement with various aspects of the clinic (timeliness of access, communication, knowledge acquisition, recommendations of the clinic to others, value added to care provided by family physician).

Results: 130 clinicians completed training to establish the PCCMCs; pre-program surveys were completed by 90% of participants; 40% completed post-training surveys. 139 patient/ caregiver satisfaction surveys were completed. 489 patients were referred to the PCCMCs; 67% were assessed. Average wait time was 1.4 months. The majority of patients received a diagnosis of mild cognitive impairment (N=99) or dementia (N=121) and 17.5% (N=57) were referred to a specialist. There were significant ($p<.001$) pre-post survey differences in clinician ratings of ability to assess and manage memory problems and ability to have a positive impact on patient quality of life ($p<.01$). 92% of post-survey respondents reported that the quality of dementia care provided in their practice setting had improved as a result of the PCCMC (38% reported "much" improved). The majority of patients/caregivers (92%) were satisfied with timeliness of access to assessment and over 87% were satisfied with various aspects of the clinic.

Conclusion: In rural, remote and underserved communities, PCCMCs create a point of access for persons with memory difficulties and their care partners to be assessed, triaged, treated, and monitored within primary care, utilizing an efficient, interprofessional team-based approach, and offering timely access to comprehensive person-centred dementia care close to home.

Nutrition care for residents with dementia in long-term care homes: Umbrella review of care aide and registered dietitian services

Allison Cammer, Debra Morgan, Susan Whiting
University of Saskatchewan

Background/Objectives: Objective: identify gaps in the current published literature related to care aide and registered dietitian services for nutrition care of long-term care residents with dementia. Background: Recent attention has highlighted the distinct food and nutrition needs of residents with dementia living in long-term care (nursing homes). Nutrition care involves assessment of nutritional need, along with providing safe and appropriate food that fulfills nutritional requirements. Within long-term care, much of the direct care responsibilities lies with care aides who provide the day-to-day assistance including at mealtimes; however, it is the registered dietitian (RD) who provides specialized nutrition care.

Methods: We sought to examine how roles and responsibilities of care aides and dietitians were described in long-term care settings. As many systematic reviews addressing nutrition care in dementia have appeared in the past two decades, we examined these using an Umbrella Review protocol. The databases searched were MedLine (Ovid MEDLINE), PubMed, and CINAHL (EBSCO Host). A combination of MeSH terms and keyword search terms addressed four categories: dementia, long-term care, nutrition, and reviews. The initial search yielded 478 publications and an additional 4 were found through hand searching. A total of 25 full-text publications were reviewed and independently assessed for eligibility by two researchers. Discussion of these articles in relation to the inclusion and exclusion criteria was undertaken to achieve consensus and the final list of 10 publications was determined.

Results: Overall, the quality of evidence in the 10 reviews was low. Surprisingly, there was little overlap in included studies between reviews, possibly owing to the variety of focuses of these ten systematic reviews. These were diverse in nature in terms of both interventions and outcomes considered. While all addressed some aspect of nutrition and the need for appropriate staffing, only three noted and discussed care aides and only three either noted or made recommendations for involvement of RDs.

Conclusion: The lack of attention to RDs and care aides in published literature represents a true gap that must be addressed in order for recommendations to enhance nutrition care for residents with dementia to be effective.

Exploring the needs and gaps in dementia care on Vancouver Island

Maya de Vos ¹, Alexandre Henri-Bhargava ², Kristine Votova ³

¹ University of British Columbia

² Clinical Associate Professor of Medicine (Neurology),
University of British Columbia

³ Vancouver Island Health Authority

Background/Objectives: Throughout Canada, different models of care exist for the assessment, diagnosis and monitoring of patients with cognitive complaints. Yet in all settings, in primary care, specialty medicine, and the interface between the two, there exist challenges and questions in defining the optimal way to care for patients. Many of these challenges vary depending on the local context. The purpose of this study was to engage with primary care physicians and specialists involved in dementia care on Vancouver Island to explore the current practices, barriers to care, and avenues to improve the care pathway.

Methods: The project was registered as a Quality Improvement project with the Vancouver Island Health Authority (Island Health), and participants gave written consent to participate and have their opinions disseminated anonymously. Structured focus groups were conducted with physicians involved in the care of patients with cognitive decline on Vancouver Island. Seven specialists and ten primary care physicians participated in separate focus groups. Discussions from both groups were recorded and transcribed. Data analysis was inductive in nature, using the principles of grounded theory methodology. Transcribed data was sequentially coded and themes extracted until saturation was achieved. Themes derived from each group were analyzed to identify themes that were held in common by specialist and primary care physicians, and themes that were restricted to one of the groups.

Results: Three common themes were identified in both the specialist and primary care physician groups. Both groups of physicians 1) reported issues with patient surveillance; 2) identified limited resources as a gap in care; and 3) called for the development of best practice guidelines based on patient presentation. In addition, both groups of physicians identified issues with the referral pathway as a key area of concern, however there were diverging ideas between the two groups. Two themes were found to be unique to primary care physicians. Primary care physicians reported that the limited time allotted for patient encounters, and challenges with navigating the system were barriers to care. One theme was identified to be unique to specialist physicians. They expressed concern with the process of re-referring patients to specialist services and the impact on patient care.

Conclusion: Further research is needed to better understand mechanisms that will allow patients with cognitive disorders to be monitored over time. The physicians in this study identified that patients presenting with cognitive concerns are common in their practice. These physicians thought that current

practice structures do not support ideal care for patients with cognitive disorders. Health systems research and implementation science need to focus on establishing formal referral, care, and communication pathways between primary care and specialty medicine to establish an integrated continuum of care for patients with cognitive disorders.

Correlation between amyloid reduction and clinical outcomes: exploratory analyses from the Gantenerumab Scarlet Road and Marguerite Road open-label extension studies

Paul Delmar¹, Geoffrey A Kerchner¹, Guoqiao Wang², Randall Bateman², Gregory Klein³, Mirjana Andjelkovic¹, Danielle Abi-Saab⁴, Szofia Bullain⁴, Alonso Montoya⁵, Paulo Fontoura⁴, Rachele Doody⁶

¹ Roche Pharma Research and Early Development

² Washington University, School of Medicine, St. Louis, MO, USA

³ Roche/Genentech Product Development, Neuroscience, Basel, Switzerland

⁴ Roche Pharma Research and Early Development, Basel, Switzerland

⁵ Medical Strategy, Hoffmann-La Roche, Mississauga, ON

⁶ Genentech Inc., South San Francisco, CA, USA

Background/Objectives: Gantenerumab, a fully human monoclonal antibody, is under investigation as a disease-modifying treatment for Alzheimer's disease (AD). In the ongoing SCarlet RoAD (SR [NCT01224106]) and Marguerite RoAD (MR [NCT02051608]) open-label extension (OLE) studies, patients with AD who received gantenerumab uptitrated to subcutaneous doses ≤ 1200 mg monthly for 2 years exhibited high levels of PET amyloid reduction, such that 52% of patients improved below the amyloid positivity threshold.(1) Here we explore the relationship between amyloid reduction and clinical outcomes during the MR and SR OLE studies

Methods: Amyloid PET reductions were quantified using a prespecified method(2) and centiloid transformation.(3) Clinical outcomes evaluated included CDR-SB, ADAS-COG11, and MMSE. The analysis included all currently available patients with week 104 PET scans from MR and SR OLE studies. Exploratory analyses included comparing clinical endpoint trajectories in patients with higher versus lower levels of PET amyloid reductions based on median split using MMRM (adjusted for baseline clinical endpoint value), and fitting a newly developed joint model for the simultaneous evaluation of biomarker and clinical endpoint longitudinal data.(4)

Results: Large mean amyloid reductions (-38 centiloids [SD 38.1] at week 52 [N=67] and -59 centiloids [SD 35.3] at week 104 [N=39]), often to below the amyloid positivity threshold, were observed. At week 104, point estimates indicated 17-46% less clinical decline in the subgroup with larger (> median)

PET reductions versus those with smaller reductions. Similar directional trends were observed across all analysis methods and clinical endpoints

Conclusion: Larger amyloid reductions at week 104 were associated with a trend toward less decline in clinical scales. Given the limited sample size and absence of a placebo arm, clinical outcome data should be interpreted with caution. However these data, together with the favorable safety profile observed at these dose levels, support the rationale for further investigation of the clinical efficacy of gantenerumab and 2 ongoing pivotal PhIII trials in patients with early (prodromal-to-mild) AD (GRADUATE I [NCT03444870]; GRADUATE II [NCT03443973]). 1.Klein, et al. CTAD 2018 2.Ostrowitzki S, et al. Alzheimers Res Ther 2017 3.Klunk WE, et al. Alzheimers Dem 2015 4.Wang G,et al. AlzheimersDem2018

Attitudes and perceptions towards dementia in the workplace

Alonso Montoya¹, Elaine Tai², David Harvey³

¹ Hoffmann-La Roche

² University of Toronto, Leslie Dan Faculty of Pharmacy

³ Dementia Dialogue

Background/Objectives: Age is the strongest known risk factor for Alzheimer's disease, and it is projected that Canadians 65 or older will make up 25 - 30% of the population by 2056. Thus, social attitudes and perception towards caregivers and patients affected by dementia has become an increasing important topic in Canada. The objective of this study is to assess attitudes and perceptions towards dementia from the caregiver and non-caregiver perspectives in the workplace.

Methods: This study is a cross-sectional anonymous survey self-completed by Hoffmann-La Roche employees in Canada. Participants (N = 352) were self-enrolled in an online survey on SurveyMonkey®. The survey consists of 30 questions to assess participant demographics, knowledge of dementia, and care-giver attitudes and perceptions towards dementia, and is an adaptation of the listed validated scales for assessing knowledge and attitudes towards people with dementia: Family Knowledge of Alzheimer's Test (FKAT), Stigma Impact Scale: Caregiver (SIS), and Dementia Attitudes Scale (DAS).

Results: Out of 352 Roche Canada employees, 75% (264) were female and 67% (237) were between ages 31 to 50. 1 in 4 respondents answered that people with dementia cannot make decisions for themselves, cannot continue to work, and considered dementia is a normal part of aging. 42% (203) answered people with dementia cannot live alone. Out of the 142 employees involved in caring for a person with dementia, 50% have experienced feelings of uselessness and 10% have experienced loneliness more often than usual.

Conclusion: The responses demonstrate a continuing need to improve our society's understanding of dementia and reduce the associated stigma in the workplace, at Roche Canada.

Continued large amyloid PET reductions at 36 months in the gantenerumab open-label extension studies

Gregory Klein¹, Paul Delmar², Geoffrey A Kerchner², Carsten Hofmann³, Danielle Abi-Saab³, Smiljana Ristic¹, Sunita Rehal⁴, Nicola Voyle⁴, Alonso Montoya⁵, Monika Baudler³, Paulo Fontoura³, Rachele Doody⁶

¹ Roche/Genentech Product Development, Neuroscience, Basel, Switzerland

² Roche Pharma Research and Early Development

³ Roche Pharma Research and Early Development, Basel, Switzerland

⁴ Roche Products Development Ltd, Welwyn Garden City, UK

⁵ Medical Strategy, Hoffmann-La Roche, Mississauga, ON

⁶ Genentech Inc., South San Francisco, CA, USA

Background/Objectives: Gantenerumab is a fully human monoclonal antibody under evaluation at subcutaneous titrated dosing schemes targeting 1200 mg monthly in the SCarlet RoAD (SR; NCT01224106) and Marguerite RoAD (MR; NCT02051608) open-label extension (OLE) studies. Previous analyses at 24 months showed large amyloid reductions of 71.7 centiloids in 16 patients naive to previous gantenerumab treatment, and in 51% of all 39 patients evaluated, amyloid levels dropped below the positivity threshold. This updated analysis reports the effects of gantenerumab on amyloid PET after 36 months

Methods: Patients with a positive visual amyloid PET scan at the time of double-blind (DB) screening were eligible for the OLE PET substudy; those who were scanned at 36 months were included in this analysis. Due to differences in titration schedules and time between DB and OLE dosing, the analysis divides patients into three cohorts: MR DB placebo (MR-Pbo); MR DB pretreated with gantenerumab (MR-Gant); SR DB patients assigned to placebo or gantenerumab (SR). Change in amyloid burden from OLE baseline was assessed via a Freesurfer standard uptake value ratio analysis of florbetapir PET translated to the centiloid scale

Results: Preliminary pooled analyses of 11 patients (MR-Pbo, 3; MR-Gant, 1; SR, 7) who had a 36-month scan by April 23, 2019, showed continued amyloid reduction between the 24- and 36-month scans. Mean (SD) centiloid values at 0, 12, 24 and 36 months were 73.3 (23.5), 42.4 (12.9), 22.2 (20.5) and 3.1 (12.7), respectively. Mean reduction from OLE baseline in the MR-Pbo (naïve to previous treatment; n=3) group at 36 months was 86.3(13.5) centiloids. All 11 patients were below the amyloid positivity threshold of 24 centiloids after 36 months of gantenerumab treatment. It is anticipated that

an additional ≈21 patients will have their OLE 36-month PET scan by June 2019

Conclusion: Updated findings are expected to confirm preliminary results and show continued reduction in amyloid burden with ongoing treatment up to 36 months. These data support the ongoing investigation of the clinical efficacy of gantenerumab in two Phase III trials in patients with early (prodromal-to-mild) AD (GRADUATE I [NCT03444870]; GRADUATE II [NCT03443973])

Specialized care unit reduces severe behavioural and psychological symptoms of dementia (BPSD) in patients dementia: a retrospective study

Phylicia Verreault¹, François Rousseau², Evelyn Keller², Alexandra Simard³, Nassima Azouaou², Manel Jarboui², Lorraine Talleria², Johanne Duguay², Chantale Mérette⁴, Annie Labbé⁴, Rossana Peredo Nunez de Arco²

¹ Centre de recherche CERVO

² Institut Universitaire en Santé Mentale de Québec

³ Institut Universitaire en Santé Mentale de Québec

⁴ Centre de Recherche CERVO

Background/Objectives: Behavioural and psychological symptoms (BPSD) associated with major neurocognitive disorder (MNCD) pose a major challenge to families and caregivers. Non-pharmacological interventions and pharmacological interventions have been widely used to address BPSD. The literature supports the use of an integrated approach including person-centered non-pharmacological and pharmacological interventions. The first aim was to characterize the patient population of a multidisciplinary specialized care unit for BPSD at the IUSMQ in Quebec City, Canada. This unit uses non-pharmacological and pharmacological interventions for patients with severe BPSD symptoms. The second aim was to evaluate the efficacy of the specialized care unit in reducing BPSD.

Methods: Data were retrospectively collected from the medical chart and entered into a database. Only the participants for whom a measure of the NPI was recorded at admission and at discharge were included in this study (N = 54 participants).

Results: Analysis of this clinical sample revealed that the NPI total score was significantly reduced at discharge as compared to admission (Mean difference = -9.15, SD = 15.22, p < .001). NPI subscales showing statistically significant improvement were agitation/aggression (p < .001), anxiety (p = .034), disinhibition (p = .030), irritability/lability (p = .011) and aberrant motor activity (p = .038).

Conclusion: These results suggest that a combined approach implemented by a multidisciplinary team can reap significant benefits for BPSD patients with advanced stage MNCD hospitalized on a specialized care unit.

Nurses' experiences in caring for older adults with responsive behaviours of dementia in acute care and perceptions of P.I.E.C.E.S. education

Marie-Lee Yous¹, Jenny Ploeg¹, Sharon Kaasalainen¹,
Lori Schindel Martin²

¹ School of Nursing, McMaster University

² Daphne Cockwell School of Nursing, Ryerson University

Background/Objectives: In Canada approximately 56,000 people with dementia are admitted to hospitals annually and 75% of these individuals experience responsive behaviours. Responsive behaviours are words/actions (e.g., repetitive questions/sentences, pacing, yelling, hitting) used by people with dementia to communicate needs and concerns related to pain, fear, hunger, or thirst. Responsive behaviours are perceived by staff to be a challenging aspect of dementia care. This study explored nurses' experiences about: (a) caring for older adults with dementia experiencing responsive behaviours in acute medical settings and (b) an educational interprofessional program in dementia care called P.I.E.C.E.S. (Physical, Intellectual, Emotional, Capabilities, Environmental, and Social assessment).

Methods: Thorne's interpretive description qualitative approach was used. In-person, semi-structured interviews were conducted with 15 nurses and other healthcare professionals (e.g., physiotherapist, occupational therapists, social worker) from acute medical hospital settings in Southern Ontario. Data were analyzed using Braun and Clarke's experiential thematic analysis.

Results: Results: The following themes were identified: (a) providing nursing care for older adults with responsive behaviours is a complex experience, (b) there are many barriers and few facilitators to dementia care within acute medical settings, (c) nurses use pharmacological and low investment non-pharmacological strategies to provide care, (d) P.I.E.C.E.S. was reported as no longer being used in practice approximately one-year post-education due to a lack of sustainability strategies, and (e) healthcare professionals perceived organizations as responsible for implementing hospital-wide and unit changes to facilitate care delivery for older adults with dementia.

Conclusion: Findings provide guidance for improved support for the practice of nurses caring for older adults experiencing responsive behaviours in acute medical settings, such as ensuring adequate staffing and holding more family/team meetings. Knowledge translation approaches are necessary to sustain dementia care practices in acute medical settings by involving and engaging multiple stakeholders (e.g., patients, caregivers, clinicians, managers, policy makers). Strategies should be implemented to provide ongoing educational reinforcements to help staff apply P.I.E.C.E.S such as annual review of educational programs and having advanced practitioners act as facilitators.

Use of a Dementia Care Pathway: Transferable Lessons

Mary Val Palumbo¹, Betty Rambur², Lori McKenna³

¹ University of Vermont

² University of Rhode Island

³ University of Vermont Memory Program

Background/Objectives: International exemplars have demonstrated the importance of early dementia diagnosis as an essential strategy toward assuring the time necessary to secure family and caregiver support (Hallberg et al, 2013). This is just one element of the New Zealand Health Pathway for Cognitive Impairment and Dementia (NZHPCID). The purpose of this study was to describe the NZHPCID at both the policy and practice levels, as a beginning steps toward understanding emerging global best practices in dementia care for potential translation and adoption. Objectives: 1) To illustrate NZHPCID; 2) To describe the workforce requirements of the NZHPCID; and

Methods: The study setting was the two largest cities in New Zealand, Wellington and Auckland. A qualitative descriptive design using semi-structured interviews was used. Critical case purposive sample was undertaken, with an initial focus on 20 primary care office and the Ministry of Health. This was followed with further recruitment of informants via by snowball sampling. Data were collected until data saturation was reached. Five general practitioners, two nurse practitioners, five nurses, one psycho-geriatrician, two case managers, four social workers, two family carers, and four employees of the New Zealand Ministry of Health were interviewed during 16 separate sessions. The interviews were audio-recorded and transcribed verbatim. Qualitative content analysis was used, with analysis supported by HyperResearch, computer-assisted qualitative software. Support of rigor followed the approach of Guba and Lincoln (1994) and was fostered through multiple steps, supporting dependability confirmability, transferability, credibility and authenticity.

Results: Primary care leadership was a key element of the pathway, creating an approach to support early diagnosis, diminishment of stigma and development of home and community supports. These community supports ranged from guaranteed family respite to dementia-friendly businesses. Coordinated teamwork inclusive of an array of disciplines supported access to care in the least restrictive environment, with an aim of preserving specialty care for those who truly need it. The findings informed a thematic illustration of the pathway, that will be presented, highlighting six main themes: 1. National standards create a progressive pathway; 2. Standards include making the diagnosis and assessing caregiving support; 3. The burden of care is eased by education, cultural sensitivity, and respite; 4. Adaptive teamwork enhances access to care and assures person/family centered care delivery

Conclusion: The use of a “dementia care pathway” provides healthcare professionals, patients and families with structure and resources that are necessary to proactively monitor individuals and provide optimal care from dementia diagnosis to end-of-life. Primary care providers who are afforded the resources necessary to diagnosis and manage dementia preserve specialty expertise and expand the capacity of both community and health care systems to better serve the needs of this vulnerable and increasingly prevalent population.

Adapting the environment of Alzheimer residents: principles and issues

Philippe Voyer

Faculté des sciences infirmières, Université Laval

Background/Objectives: Several projects have been created to meet the needs of seniors with major neurocognitive disorders (eg Alzheimer’s disease). The most well-known adapted housing projects are Alzheimer villages, Alzheimer farms and Greenhouse projects. The first objective of this presentation will be to highlight the principles that underlie these Alzheimer special housing units and the research data that support them. The second objective will be to present two new Alzheimer housing developments that have been created in the last two years in the province of Quebec.

Methods: The first part of this conference is based on a scientific literature review, while the second part is based on two Canadian experiences in the province of Quebec. These projects were carried out from 2017 to 2019. Principles that were applied in these projects will be presented with supportive qualitative data and pictures showing the changes that took place. A “before and after” transformation of the “Maison l’étincelle” will demonstrate how the Alzheimer principles have been applied to this Alzheimer unit (n=10). Another brand-new project called “Humanitae” housing 170 Alzheimer residents will also be presented. How scientific principles have influenced this latter institution will be explained and presented with images.

Results: The literature review allowed the identification of the essential principles for creating a suitable environment for Alzheimer residents. Our two Canadian experiences that will be described in this presentation have made it possible to identify the unique issues of creating an Alzheimer unit or institution in Canada. For instance, the long Canadian winter poses certain challenges that require creative solutions. Dementia villages in Italy or in the Netherlands can not be replicated as such in Quebec City given its harsh winter. As a result, stimulating space rooms were built inside favoring leisure and domestic activities and representations of nature which are essential to avoid boredom and feeling imprisoned. Regulatory organization concerns for safety were the most frequent issues encountered.

Conclusion: It is possible to adapt an environment to the needs of Alzheimer residents insofar as it is a priority for all the actors involved.

Safety or freedom in long-term care facilities for people with Alzheimer disease: what are the preferences of citizens, health care managers, family caregivers and other interested parties?

Philippe Voyer¹, Émilie Allaire²

¹ Faculté des sciences infirmières, Université Laval

² Centre d’Excellence sur le vieillissement de Québec

Background/Objectives: Alzheimer villages, Alzheimer farms and Greenhouse projects are new types of housing for people with major neurocognitive disorders. Leaders behind these organizations have a totally different perspective on safety issues because they value freedom. The objective of this presentation is to describe the results of a survey which is currently being conducted among different groups of people to determine whether they prefer freedom or safety in regard to housing for people with Alzheimer.

Methods: This is quantitative research using a survey design. Our questionnaire is being administered to four groups of people. Our first sample was randomly selected with the support of the SOM Survey company. A total of 2000 people were randomly selected from the entire Quebec population (25 years old and over). Health care managers responsible for publicly-funded nursing homes will be targeted for the second sample. We have secured the support of the Government for the recruitment of these managers. A non-random sample of 200 health managers is the target sample size. Family caregivers of Alzheimer patients is our third target sample. Quebec Alzheimer society federation has accepted to recruit 200 family caregivers. Finally, a sample of 200 people interested in nursing and aging will be drawn using social media.

Results: Having recently received the authorization from the Ethical research committee of Laval University, the survey is being conducted this summer. Results will be available for the conference. They will allow us to describe the preference for freedom or safety among the four groups. Many case studies are included in the survey and we will be able to determine for each group where it draws the line for its taste for freedom. We have case studies testing their tolerance for the risk of falling, burning, choking, getting lost outside, health risks (respecting a special diet, drinking alcohol), animal bites, etc.

Conclusion: Results for this survey should support the decisional process of those interested in innovating the housing sector for people with Alzheimer.

A cross-cultural investigation of Neurologic Music Therapy (NMT) interventions on cognitive improvement in patients with mild-to-moderate Alzheimer's disease and mild cognitive impairment: a perspective study

Bing Li, Michael Thaut

Music and Health Research Collaboratory, University of Toronto

Background/Objectives: The positive effect of music therapy for patients with dementia has been frequently documented in the clinical research literature, including areas of cognitive function, daily living skills, and behavioral and psychological symptoms. Laboratory experiments also suggest music-enhanced cognitive changes, particularly for memory. However, from a research perspective, several systematic reviews with meta-analysis reported low-quality evidence on the cognitive improvement. Therefore, to better understand the effectiveness of music therapy, more randomized control studies with replicable protocol are needed.

Methods: The perspective RCT study aims at investigating the effectiveness of Neurologic Music Therapy (NMT) interventions on cognitive improvement for patients with mild-to-moderate Alzheimer's disease (AD) and Mild Cognitive Impairment (MCI). The study will be conducted in different cultural contexts, namely Canada and (mainland) China. Participants will be randomly assigned to four groups: 1) cognition-emphasized NMT interventions; 2) sensorimotor-emphasized NMT interventions; 3) receptive music listening; and 4) usual care. Outcomes will be measured by Montreal Cognitive Assessment (MoCA), Digit Span Test (forward and backward), and Neuropsychiatric Inventory (NPI).

Results: This poster focuses on presenting the process of developing intervention protocols under the NMT framework, and how research findings from neuroscience are used to guide the protocol development.

Conclusion:

Who cares: A pilot study on caregiver stress of family caregivers for persons with dementia in an immigrant population

Thirumagal Yogaparan ¹, Thirunathan Shanmuganathan ², Anicha Vickneswaran ², Sruthy Sriharan ²

¹ Baycrest Health Sciences, University of Toronto

² Scarborough Grace FHO

Background/Objectives: Caring for people with dementia can be very challenging and stressful. The immigrant Tamil community of Canada often has limited formal support and family members often undertake care giving. Nonetheless,

many family caregivers often deny any caregiver stress and frequently decline formal help. The purpose of this study was to assess caregiver stress in Tamil speaking family caregivers for persons with dementia and their formal and informal supports.

Methods: Five Tamil caregivers of dementia patients who were fluent in English were recruited to identify their preferred measure of caregiver stress. They completed the Zarit Caregiver Burden Scale, Caregiver Preparedness Scale and Kingston Caregiver Stress Scale (KCSS). All 5 participants chose the KCSS as the preferred scale. We translated the KCSS into Tamil and then back translated it to English. A prospective study was then conducted in a geriatric clinic affiliated with a Family Health Team serving Tamil speaking population in the Greater Toronto Area. A convenience sample of 30 family caregivers of persons with different types of dementia participated in the study from Nov 2017 to Jan 2019. Each caregiver took part in an in-person or telephone interview answering demographic and caregiving questions and completing the Tamil translation of the KCSS. Information about the people with dementia was obtained from the electronic medical records.

Results: Caregiver participants ranged in age from 31 to 90 years, with the majority being 55-60 years; 66 % were female; 50% of the caregivers were daughters; 20 % sons and 16 % spouses. 40% received formal support from publicly provided home care and 10 % received private paid support; and only 10% were connected to Alzheimer Society. 90% the participants answered yes to a separate question asking if they have caregiver stress. The KCSS scores ranged from 11- 42 with a mean score of 29.1, (The KCSS has a potential total minimum score of 10, and total maximum score of 50, no reported stress would be 10, the scores of < 16 indicates mild stress, 16-24 moderate stress, >24 points severe caregiver stress). The KCSS the question "Do you have concerns regarding the future care needs of your spouse/relative" scored the highest point

Conclusion: This study identified that only a small proportion of immigrant Tamil speaking family caregivers of persons with dementia are receiving support from publicly available home-care or the Alzheimer Society, and they endorse having significant caregiver stress. Out of the three categories of caregiver stress on KCSS, the area related to specific caregiving tasks was associated with greater stress than financial issues or family issues. Further research is necessary to better understand the factors contributing to the lack of use of formal supports by this population and approaches to help reduce their caregiver stress.

Translating research into practice: Investigating the impact of Alzheimer's diagnostics in Canada (IMPACT-AD)

Mari L. DeMarco ¹, Ging-Yuek Robin Hsiung ¹, John R. Best ¹, Howard Chertkow ², Serge Gauthier ³, Jason Karlawish ⁴, Howard Feldman ⁵

¹ University of British Columbia

² Baycrest

³ McGill University

⁴ University of Pennsylvania

⁵ University of California San Diego

Background/Objectives: A current challenge in Alzheimer's disease research and patient care is early and accurate diagnosis. Fortunately, we now know that the measure of amyloid-beta and tau proteins in cerebrospinal fluid can improve diagnostic accuracy. As a result, many countries have adopted this testing in routine care, however, Canada has yet to act due to a lack of evidence of the utility and benefit of these biomarkers within our healthcare system. The goal of this study is to bridge this knowledge translation gap between diagnostic accuracy studies and clinical utilization within the Canadian healthcare system.

Methods: IMPACT-AD is an observational study that will develop a comprehensive understanding of how Alzheimer's disease biomarker testing impacts medical and personal decision-making, and healthcare costs. Participants will undergo a thorough diagnostic workup by a dementia specialist, including a lumbar puncture for analysis of amyloid-beta and tau proteins in cerebrospinal fluid. Dementia specialists will be surveyed pre- and post-disclosure of biomarker results for data including: diagnosis, diagnostic confidence, and medical management plans. The biomarker results will also be shared with the participants and their study partners, who will also be surveyed pre- and post-biomarker results for information including, for example, understanding of the diagnosis, and long-term care and financial planning.

Results: IMPACT-AD has partnered with the Canadian Consortium on Neurodegeneration in Aging's COMPASS-ND study, which is enrolling individuals with various types of cognitive disorders from 12 sites across Canada. IMPACT-AD will generate first-of-its-kind data on the diagnostic, economic and personal utility of Alzheimer's disease biomarkers as part of the diagnostic workflow for patients with cognitive impairment.

Conclusion: IMPACT-AD was designed to inform positive change within the Canadian health care system to improve care and support for individuals living with Alzheimer's disease and their families.

Multiple object tracking training can enhance selective attention and cognitive flexibility in older adults.

Caroline Spaner ¹, Brian Christie ¹, Stela Musteata ², Jodie Gawryluk ³, Scott Hofer ³, Alex Henri-Bhargava ¹, Rebecca Kenny ⁴

¹ University of British Columbia Island Medical Program

² Università Vita-Salute San Raffaele

³ University of Victoria

⁴ University of British Columbia

Background/Objectives: Age-related declines in cognitive flexibility and attention are common, and have significant effects on autonomy and quality of life of older adults. These losses are correlated with significantly higher rates of morbidity, mortality, and early entry into long-term care facilities. By 2031, 25% of Canadians will be over 65, suggesting a need to develop accessible and targeted interventions to allow individuals to age in good cognitive health. The objective of this study was to determine if a 3-dimensional multiple object tracking training (3D-MOT) intervention could enhance measures of attention and cognitive flexibility in older adults.

Methods: The study was performed in a convenience sample of individuals aged 63-87 years old recruited through senior centers in the Greater Victoria region. The Stroop task was administered prior to participants engaging in a series of seven training sessions with Neurotracker, a 3D-MOT software program. Following completion of the training sessions over a period of 7 weeks, the Stroop task was again administered. On-Time minus Off-Time Stroop test scores measured cognitive flexibility (CF), and selective and divided attention. Scores were primarily analyzed to determine the significance in score changes post-intervention. A control group completed the Stroop test at week 1 and week 8, without completing the Neurotracker.

Results: Following Neurotracker training, On-Time minus Off-Time scores had significantly improved ($M = 5.01$, $SE = 1.44$, $p = 0.002$). Significant changes were measured as well in the Off-Time conditions ($M = 4.90$, $SE = 1.44$, $p = 0.002$), which measured psychomotor speed (PMS). Significant changes were measured as well in the On-Time conditions ($M = 9.39$, $SE = 1.74$, $p < 0.001$), which measured PMS and CF together. No significant changes were found in any Stroop task measure in the control group.

Conclusion: These results suggest that the Neurotracker may be an effective tool for improving attention and cognitive flexibility in elderly individuals.

End-of-life care for people living with dementia in rural areas: a scoping review

Valerie Elliot ¹, Debra Morgan ², Julie Kosteniuk ¹, Amanda Froehlich Chow ¹, Melanie Bayly ¹, Megan E. O'Connell ¹

¹ University of Saskatchewan

² University of Saskatchewan

Background/Objectives: End-of-life care for people with dementia refers to palliative care in the terminal phase of their illness. Specialized services and supports are intended to provide comfort and relief to patients and caregivers in settings such as hospice, long-term care, in the community, or at home. With an aging population, the need for end-of-life services and interventions for people with dementia and

their families is increasing. This is especially so in rural areas where additional challenges to accessing and utilizing care services often exist. The purpose of this scoping review is to summarize findings and identify gaps in the existing evidence.

Methods: Based on the five-step methodological framework of Arksey and O'Malley, built on by Levac et al., and the Joanna Briggs Institute, peer-reviewed studies were identified in searches of four scholarly databases (Medline, EMBASE, and CINAHL, and PsycInfo). Reference lists of all peer-reviewed studies selected for inclusion were searched for any additional, relevant peer-reviewed studies. Also, grey literature was identified in searches of six grey literature databases, eight targeted websites, and Google search engine. A collaborative research team approach was used in the iterative process of developing the research questions, search strategies, and data extraction forms and across all levels of record screening. Study characteristics were described and findings were grouped thematically.

Results: Twelve peer-reviewed, original research articles (7 quantitative and 5 qualitative; 4 rural and 8 rural-urban) were included for synthesis. In addition, 24 grey literature sources (11 conference abstracts, 5 metadata tables, and 1 each of the following: a presentation, project update, media release, commentary, report, book chapter, and a dissertation) were included for synthesis. Overarching preliminary themes included: knowledge about dementia in general and as a terminal illness; availability and accessibility of dementia-related end-of-life care, support services, and preferred care settings; decision-making about care, the importance of a person-centered approach, and collaborative support; perspectives on artificial nutrition, hydration, and comfort care; and quality of life and death. Overall, there was a gap in the evidence regarding end-of-life care for rural people living with dementia due to Alzheimer's disease or other aetiologies.

Conclusion: More research exploring end-of-life care for rural people with dementia and support for their families is needed to examine the unique experiences and needs of this group. Findings of this review can be used to inform future research, policy, and intervention strategies designed specifically for rural areas aimed at providing the best care and support for this population.

Factor analysis and psychometric properties of the Brief Symptom Inventory-18 Item in rural caregivers of persons with dementia

*August Kortzman, Megan O'Connell, Debra Morgan,
Andrew Kirk
University of Saskatchewan*

Background/Objectives: Although caregiving for someone with dementia is associated with positive experiences such as

increased positive affect and feelings of role mastery, increasing levels of depression and anxiety are common among caregivers, as are decreasing levels of physical health. Measuring psychophysiological distress in this population is important; for example, co-morbid mental health difficulties for caregivers is associated with increased health service use. The Brief Symptom Inventory - 18 Item (BSI-18) has been shown to be a valid and reliable self-report measure of depression, anxiety, and somatic distress in other populations, but its measurement properties have been understudied in this context.

Methods: We performed confirmatory factor analyses on two BSI-18 factor structures: the three-factor clinical model and the four-factor theoretical model. The sample was comprised of 197 rural caregivers of patients who were diagnosed with dementia at a memory clinic. Reliability and validity analyses were additionally completed. Given past literature, group differences by gender and by caregiver-care recipient relationship were also explored.

Results: A robust maximum likelihood estimator was used due to an observed floor effect. Fit indices for both the clinical and theoretical models appeared to be acceptable. The global construct provided evidence of reliability, as did the factors that were shared between the two models (depression, somatic complaints). The clinical model's factor of anxiety approached reliability; neither of the theoretical model's two discrete factors (generalized anxiety, panic) approached the same threshold. Evidence of validity was observed through correlational analyses using relevant measures (e.g., 12-Item Short-Form Survey, Zarit Burden Inventory). Individual items loaded onto their expected factors; loadings were all suitable with the exception of an item addressing suicidal ideation. No significant differences were observed when comparing groups by gender, by relationship with the care-recipient, or when collapsed across the two variables.

Conclusion: Evidence for utility only emerged for the three-factor clinical model. Few caregivers reported psychophysiological distress, leading to non-normal distribution and need for robust analyses. The current sample was newer to the role; research suggests they may not yet be experiencing/acknowledging high levels of distress. A direction for future research is to examine the factor structures on a sample further into the caregiving role. It should be noted that this convenience sample may have exhibited a high level of support-seeking. This research will help advance the BSI-18 as a reliable and valid instrument for caregivers of persons with dementia.

Project ECHO care of the elderly - the need for a dementia focused ECHO

*David Conn¹, Lisa Sokoloff¹, Sid Feldman¹, James Chau²,
Andrea Moser¹, Navena Lingum¹, Shaen Gingrich³,
Salma Shaikh¹*

¹ Baycrest

² NOSM; Health Science North

³ Health Science North

Background/Objectives: Project ECHO (Extension of Community Health Outcomes) originated in New Mexico and now runs in 35 countries. This educational program follows a ‘Hub-and-Spoke’ model of knowledge dissemination and capacity building; exchanging knowledge between academic health science centres (Hubs) and primary care learning partners (Spokes). Through videoconferencing technology, knowledge flows in multiple directions: from specialists to primary care providers; between primary care providers; and from primary care providers to specialists. Baycrest, in partnership with North East Specialized Geriatric Centre, has been leading ‘Project ECHO Care of the Elderly’ (COE) building the capacity of over 200 primary care providers since January 2018.

Methods: ECHO COE curricula consist of multiple topics that focus on dementia including an overview of dementia and responsive behaviours. Other topics, while not specifically focused on dementia have a strong component related to dementia (e.g., driving, sleep disorders, polypharmacy, delirium, etc.) Learning partner presented cases predominantly feature patients with dementia, regardless of the weekly topic. Participant feedback frequently includes requests for more sessions focused on dementia, specifically management. ECHO COE Dementia Pilot: Each weekly 90 minute session will include a short didactic presentation by dementia care specialists on a specific topic followed by cases presented by learning partners. Feedback and recommendations are provided by the Hub team and the other learning partners. The Dementia ECHO curriculum will be developed through a review of feedback from the previous ECHO COE cycles and a needs assessment of physicians and interprofessional team members who work in dementia care.

Results: Our ECHO program has demonstrated statistically significant increases in both knowledge and self-efficacy across all cycles. Satisfaction with the program is high. Wait lists for ECHO COE demonstrates both need and desire for this educational program. Existing Dementia ECHOs in the USA focus primarily on Skilled Nursing Facility staff as learning partners. One ECHO targeting providers caring for nursing home patients with dementia significantly reduced the use of physical restraints. Other research suggests that a Geriatric Mental Health ECHO program resulted in improvements in knowledge and treatment practices in clinician geriatric mental health care. Recently the Alzheimer’s Association (USA) initiated a pilot ECHO to connect dementia care experts with leaders from assisted living communities across the US with positive findings.

Conclusion: Project ECHO COE is an effective educational program for building capacity in seniors’ care for primary care providers. Demand for an ECHO focused on dementia care

has been expressed by learning partners. We will be piloting an ECHO COE focused on Dementia in Fall 2019 to fulfill the need for building capacity in primary care providers for care and management of dementia. We intend to partner with the Alzheimer’s Society.

Dementia prevention in front line care: feasibility, acceptability, and effectiveness of the Brain Health and Wellness project approach

David Conn ¹, Kiran Rabheru ², Keri-Leigh Cassidy ³, Claire Checkland ⁴, Daria Parsons ⁴, Ariane S. Massie ⁵, Julie Spence Mitchell ⁴

¹ Baycrest Health Sciences

² University of Ottawa

³ Dalhousie University

⁴ Canadian Coalition for Seniors Mental Health

⁵ York University

Background/Objectives: The vision of preventing 1/3 of dementia cases (Lancet 2017) requires an urgent, impactful change in health behaviour by middle-aged and older Canadians. Change in key health domains might lead to dementia prevention by up to 35%. Clinicians, however, face many barriers to encouraging behaviour change in their patients such as a lack of time, tools, training, and a systematic approach. The Brain Health and Wellness Project led by the Canadian Coalition for Seniors’ Mental Health, in collaboration with the Fountain of Health invited clinicians from across Canada to incorporate behaviour change tools in their practice.

Methods: The goal was to demonstrate the scalability, uptake, and effectiveness of user-friendly behaviour change tools in routine practice, previously developed by the Fountain of Health project. Clinicians were invited to register for the project and to complete an education session either in-person or by webinar. A health behaviour change toolkit which included the health behaviour change tools and supporting documents was sent to registered clinicians. Registered clinicians were asked to invite patients over the age of 40 to complete a Pre-Health and Resilience Questionnaire, set a S.M.A.R.T. health goal in one of five domains, and follow-up about a month later by phone or in person to complete the Post-Health and Resilience Questionnaire. Completed patient forms and clinician surveys were sent back to the project team for analysis. Measures of feasibility, acceptability, and effectiveness of the tools in practice were captured and analyzed.

Results: Information about the project was disseminated to over 15,000 clinicians by email or newsletter. 2,177 front line clinicians completed an education session. Of these clinicians, 1,496 attended in person education sessions, 708 attended a live or pre-recorded webinar. In addition, 290 patients attended community forums. Health behaviour change toolkits were distributed to 760 clinicians who registered to participate in

the project across Canada. Preliminary data will be provided on the acceptability of the tools and the effectiveness of the behaviour change tools, which was captured through patient behaviour change measures (goal success and improved wellbeing). Data on the use of an optional online App will also be presented.

Conclusion: Results demonstrate the feasibility of widely scaling up the use of health behaviour change tools in front line care. Results of this project contribute to new perspectives on how to successfully incorporate health promotion approaches to dementia prevention in front line care and insights into the effectiveness of behaviour change tools for brain health and wellness.

Providing and promoting quality care for patients with Chronic Obstructive Pulmonary Disease and Dementia.

*Sophia Aksenchuk
Toronto Western Hospital - University Health Network*

Background/Objectives: Dementia accounts for 12% of all hospitalizations in Canada, with the majority of patients admitted for treatment of complex conditions, such as Chronic Obstructive Pulmonary Disease (COPD). In Canada, 5.1% of patients with dementia also have COPD and this value is anticipated to increase in the future. Dementia and COPD account for the greatest total hospital costs of any other medical condition at \$753.3 million and \$404.0 million respectively. Thus, it is of vital importance to address the needs of patients with COPD and dementia in order to balance costs, reduce admission and readmission rates, and promote quality of life.

Methods: The purpose of this poster presentation is to share the current practice of care for patients with COPD at Toronto Western Hospital and what the current gaps and challenges are with regards to implementing this care for patients specifically with dementia. The Health Quality Ontario's (2017) Quality Standards for COPD were adapted to the care delivery model and practice standards of the General Internal Medicine units at Toronto Western Hospital. The COPD Quality Based Procedure pathway was developed, implemented, and reinforced by an interprofessional team of allied health leaders, unit managers, clinical directors, and physicians. Despite the significant progress noted with regards to care delivery, readmission rates, and transition support, there is significant potential for growth and improvement in adapting the pathway to improve the quality of care for patients experiencing both COPD and dementia. The Transitional Care Specialist reviewed cases and team progress throughout the development of this project.

Results: Common trends, learnings, and barriers as observed by the Transitional Care Specialist within the interprofessional team (**names to be listed on the final poster**) are shared in

this presentation along with future directions and intentions as to how we can meet and address these limitations. 3 critical points in care where improvements can be and are being made include - (1) Promoting independence and reinforcing inhaler education for patients with Dementia; (2) Early follow -ups with a specialist and/or family doctor; (3) Supporting patients and caregivers beyond discharge (e.g. H&CC, TIPS, HAL).

Conclusion: Attendees will be able to learn what the current practice standards are in Ontario as informed by the Ministry of Health and Long Term Care, what barriers and limitations are observed with regards to implementing these standards for patients with dementia and how care may be improved moving forward. As an interprofessional team with partnership with patients and caregivers we can enable and empower patients to manage their chronic conditions at home and in the community as they prefer.

Defining dementia-friendly research: engaging people with lived experience as collaborators and advisers

*Barbara Lindsay, Maria Howard
Alzheimer Society of B.C.*

Background/Objectives: There is currently a shift occurring in health research. In 2011, the Canadian Institutes of Health Research launched the Strategy for Patient-Oriented Research grounded in the view that patients should be proactive partners engaged in the research process. People living with dementia have historically been excluded from research and are largely still excluded. This is a result of the belief that people living with dementia are unable to understand research processes or give proper consent. This is untrue. People living with dementia and their care partners are experts in the lived experience of dementia and can contribute greatly to research.

Methods: The Alzheimer Society of B.C. is committed to defining and promoting a model of research that meaningfully engages and partners with people living with dementia and their care partners as participants, collaborators and advisers: dementia-friendly research. In October 2018, the Society hosted a pre-conference workshop at Canadian Association on Gerontology's annual conference: "Strategies for engaging people living with dementia in research: Facilitating a national conversation" in partnership with the University of British Columbia's Centre for Research on Personhood in Dementia. The event brought together researchers, people living with dementia, care partners, health leaders and other key stakeholders from across Canada to start defining what dementia-friendly research could look like and to identify the barriers that exist in moving towards this model.

Results: The following key points arose from participants' moderated discussions: Research is dementia-friendly when it: • Meaningfully engages people affected by dementia before

the study begins to develop research questions. • Invites people with lived experience to take on advisory and co-researcher roles during the study. • Commits to accessible knowledge mobilization after the study is completed. To overcome barriers to dementia-friendly research, researchers must: • Combat the stigma by examining their own beliefs and taking part in larger efforts, such as education sessions and awareness campaigns. • Educate research ethics boards on the unique needs and abilities of people living with dementia. • Create flexible research designs to meet the changing realities of people living with dementia and allow for their continued participation throughout the study. This includes using methods that don't solely depend on written or verbal communication and scheduling activities around the person living with dementia.

Conclusion: The Alzheimer Society of B.C.'s vision is a world without Alzheimer's disease and other dementias and this begins with a world where people affected by dementia are acknowledged, supported and included. Research is key to creating this future. However, for this world to become a reality, research must be as effective as possible and this can only be achieved by understanding that people living with dementia and their care partners are essential to the research process. By embracing dementia-friendly research we can create a dementia-friendly future.

Towards Dementia Friendly Emergency Departments: A mixed method exploratory study identifying opportunities to improve the quality and safety of care for people with dementia in emergency departments.

Courtney Shaw¹, Gerrard Armitage², Andrea Capstick³

¹ SE Research Centre

² University of Bradford/ Bradford District Care Trust

³ University of Bradford

Background/Objectives: People living with dementia (PLWD) are frequent users of Emergency Departments (ED's). They tend to have complex care needs as a result of multi-morbidities, cognitive impairments and enhanced need for social support. Despite the prevalence of dementia in ED patients, the physical environment and care processes are typically not designed to meet their holistic needs. The objective of this project was to create a model of dementia friendly emergency care

Methods: This is a mixed and multiple methods study which used an iterative and sequential design to present a holistic evaluation of the current experiences of the key parties- patients, caregivers, and ED staff involved in receiving and providing care. These methods included; 1) A literature review on geriatric and dementia friendly ED's 2) A national survey (N=403) to explore current experiences of ED care from the perspective of patients and caregivers; 3) 32 hours of observation in ED and qualitative interviews with health

professionals (N=29) to understand the barriers and facilitators of providing dementia friendly care in ED. The theoretical perspective of the Human Factors Approach to patient safety and systems engineering underpins this work. The project included PLWD and caregivers as collaborators and co-designers in both the development of the research tools and in shaping the project outputs.

Results: A set of statements on the key components of Dementia Friendly ED's was co-designed by PLWD and caregivers from results. These statements highlight the importance of empathy, Dementia awareness, and a dyad approach to care. Staff interviews highlight barriers which may affect the healthcare team's ability to provide effective dementia care-including poor integration of communication systems which impacts quality and continuity of care, physical environments which cause PLWD distress, and difficulties with staff recruitment, retention and training. These systemic challenges both give rise to and exacerbate poor organisational and safety cultures which can lead to staff- patient interactions become less relationship-centred. These outputs are used to create a model which highlights practical changes to the physical environment of the ED, the care processes required to provide holistic care, and the staffing complement required. The model's is underpinned by, and predicated on, organisational culture which values relationship centered care.

Conclusion: The complex needs of PLWD are fundamentally misaligned with the rapid triage systems and intervention based focus of a typical ED. This misalignment of patient needs and the current model of service provision leads to poor patient and caregiver outcomes (anxiety, overstimulation, unmet needs) and poor staff experiences (feeling overworked, unsupported and burnt out). Adopting some, or all of the proposed adaptations in structures, care processes, and approaches to care identified in this research is likely to help align ED care to priorities of PLWD and caregivers.

Five Top Tips for partnering with people with dementia in research

*Courtney Shaw, Heather McNeil, Paul Holyoke, Chanile Vines
Saint Elizabeth Research Centre*

Background/Objectives: Over the last 30 years there has been a shift in thinking about the design and delivery of health care services. The narrative of patients and care partners as passive recipients, or consumers of care has been replaced by a recognition that patients can be active contributors and co-producers. However, some voices are still largely excluded in research and co-design, including people living with dementia (PLWD). This poster will draw on the experiences of SE research centre staff who have collaborated in research and co-design processes with PLWD to highlight the value and feasibility of partnering with experts by experience.

Methods: The key messages from this poster emerge from a variety of research projects which involved PLWD as participants or co-design partners. These projects include, the creation of standards for dementia friendly emergency care (Dr. Courtney Shaw), the co-design of tools to support development of care partnerships in the dementia care triad (Dr. Heather McNeil) and the development and testing of an App to help patients and families find supports in their area (Chanile Vines, MSc)

Results: Our 5 key message for researchers who plan to partner with people with dementia in their work are; 1) Make a commitment to genuine partnership- Tokenistic involvement is neither sufficient nor appropriate. Involve experts by experience early, and often. 2) When working with PLWD the foundations of successful partnership are empathy and trust. Consider the need to extend project timelines to allow for relationship building. 3) Tailor your methods to the strengths of your participants to ensure they can be active, autonomous and valued contributors. Ensure a comprehensive consent plan that includes both formal capacity assessment and ongoing process consent procedures. 4) Consider the preferences and needs of your participants and ask how you can support your participants. Query participants on what adaptations they require to facilitate involvement. 5) Involve care partners, but remember that the perspectives of care partners may be different to that of those living with dementia.

Conclusion: It is possible, and desirable for PLWD to make autonomous contributions to research. Increasing participation of people with personal experience of living with dementia is a valuable endeavor, but requires adapted practice by researchers to enable, facilitate and support engagement.

What do caregivers and care providers want from care partnerships? Co-creating user friendly tools and processes to support a person-centered, relationship-building, team approach to care.

Heather McNeil¹, Courtney Shaw², Paul Holyoke¹, Justine Giosa¹, Bilal Khan², Mary Shultz³

¹ Saint Elizabeth Research Centre

² SE Research Centre

³ Alzheimers Society of Canada

Background/Objectives: Family/friend caregivers (caregivers) are a critical source of intimate knowledge about the person living with dementia and can provide care providers with the information that they need in order to provide person- and family-centered care (PFCC). However, caregivers often feel unacknowledged as a resource, and care providers report barriers to effective collaborative working with family and clients. Given the important role that each member of the dementia care triad plays in the delivery of PFCC, it is important to investigate how caregivers and people living

with dementia can build strong working relationships with care providers to support care partnerships.

Methods: A co-design approach following the Participatory Research to Action (PR2A) Framework was used to enhance collaboration by, for, and with the people who will be using or most directly impacted by the outcomes of our work. We conducted 6 co-design workshops in Ontario with caregivers (n= 12) and care providers (n= 14) of PLWD. During the co-design workshops, participants engaged in hands-on activities that allowed them to deeply reflect and then express their lived experiences and ultimately reflect on their ideal experience of care partnerships in the dementia care triad and its embodiment. Artifacts created in the co-design sessions and field notes were analyzed for recurring themes using constant comparative analysis

Results: Results of this project highlighted two keys themes; 1) the need for structured supportive tools to facilitate the development of relationships between caregivers, PLWD, and care providers, and 2) the need for ongoing support throughout various transitional periods of the dementia journey. Two tools have been created. The first is the “Dementia Journey Journal” which blends information sharing, guided reflective and therapeutic exercises and practical tools to foster relationship building. The second is a strategic advice document to guide organization- and system-level actors to support the needs identified and addressed in the Dementia Journey Journal. This document provides clear, supportive guidance to develop a ‘dementia friendly’ integrated care system, and is relevant for any health systems wanting to be more supportive across the dementia trajectory

Conclusion: The tools we have co-designed equip caregivers to support PLWD while minimizing the impact on their own quality of life by supporting their relationship with care providers across the dementia journey The next stages of the project entails further co-design to ensure 1) cultural adaptation with communities across Canada with a particular focus on rural, remote, ethnic minority and indigenous communities 2) translation of the Dementia Journey Journal into an app to increase accessibility, and 3) the scale and spread of these tools nationally, with continued evaluation and development.

Brain gray matter volume associations with abnormal gait imagery in patients with mild cognitive impairment: results of a cross-sectional study.

Olivier BEAUCHET¹, Harmehr Sekhon¹, Gilles Allali², Maxime Montembeault³

¹ McGill university

² Gevena University Hospital

³ University of Montreal

Background/Objectives: Individuals with mild cognitive impairment (MCI) have worse gait performance compared to

cognitive healthy individuals (CHI). The discrepancy between imagined and performed Timed up and go (TUG), known as the TUG delta time, is a marker of brain gait control impairment in individuals with MCI. The study aims to examine the association between the TUG delta time and brain gray matter (GM) volumes in CHI and individuals with MCI.

Methods: A total of 326 participants (age 71.3 ± 4.5 ; 42% female), 156 CHI and 170 MCI, with TUG delta time and a brain T1-weighted MRI were selected in this cross-sectional study. The GM volume association with TUG delta time was examined in CHI and MCI assuming that increased TUG delta time would be associated with locally decreased GM volumes.

Results: TUG delta time was higher in individuals with MCI compared to CHI ($43.4 \pm 34.4\%$ versus $30.1 \pm 27.6\%$ with $P < 0.001$). The associations of brain GM volumes with TUG delta time are showed in Table 1 and Figure 1. No significant association at the cluster-corrected threshold was found in CHI, whereas TUG delta time was negatively associated with a large medial temporal cluster including the right entorhinal cortex, the amygdala, the parahippocampal gyrus, the insula and the hippocampus ($P \leq 0.05$ cluster-corrected) in individuals with MCI.

Conclusion: The main finding is that increased TUG delta time was negatively associated with the GM volume of the right medial temporal lobe in individuals with MCI but not in CHI. This association suggests that TUG delta time may be an appropriate marker gait control in individuals with MCI, discrepancy between imagined and performed TUG (i.e., worst gait control) being associated with a decreased GM volume (i.e., worst brain structure) in a key brain region for gait control.

Written and oral language impairment in PCA (Posterior Cortical Atrophy): review of literature and description of 3 cases

Catherine Brodeur¹, Joël Macoir²

¹ Institut Universitaire de Gériatrie de Montréal

² Université Laval

Background/Objectives: PCA is typically considered to be a visual syndrome, primarily characterised by progressive impairment of visuo-perceptual and visuo-spatial skills. Alexia and agraphia are frequent, while speech and nonvisual language functions are relatively spared. However, we have recently assessed 3 patients presenting with complaints of language difficulties and having language impairment affecting word-finding abilities and comprehension. The different evaluations were all compatible with PCA. Our goals were to review the literature on language impairment in PCA and compare our clinical findings with the available literature. We focused mainly on nonvisual language impairment, as this is less frequently described in PCA.

Methods: A summary of the literature review will be presented, followed by the description of the 3 cases, including their results on the neuropsychological and speech-language assessments and their structural and functional neuroimaging data.

Results: In addition to reading and spelling problems, the first two patients showed anomia not only on confrontation naming (in which visuo-perceptual problems can contribute to difficulties) but also in spontaneous speech and verbal fluency tasks. They also had impairment in sentence comprehension. We believe that some of the language difficulties can be ascribed to deficits in attention, working memory and executive functions. The third case is currently under analysis.

Conclusion: Nonvisual language impairment can be compatible with the diagnosis of PCA. The functional origin of written and oral language difficulties is probably multifactorial.

Predictors of cholinesterase inhibitor and memantine use in newly admitted nursing home residents with dementia and/or cognitive impairment: impact of drug policies in Saskatchewan and Ontario, Canada

Colleen Maxwell¹, Laura Maclagan², Michael Campitelli², Shenzhen Yao³, Christoffer Dharma², Tracey Sherin³, David Hogan⁴, Susan Bronskill²

¹ University of Waterloo, School of Pharmacy

² ICES

³ Saskatchewan Health Quality Council

⁴ University of Calgary

Background/Objectives: Varying prevalence of cholinesterase inhibitor (ChEI) and memantine use has been documented across jurisdictions, likely driven by population characteristics but also by reimbursement policies. Coverage is often not provided for persons with more severe cognitive impairment, those who show deterioration while receiving the medications, and those on contraindicated medications. We compared patterns and predictors of ChEI/memantine use at admission to nursing homes in Saskatchewan and Ontario, Canada, two provinces with more restrictive and less restrictive reimbursement policies, respectively.

Methods: Newly admitted nursing home residents with dementia and/or cognitive impairment were identified using linked administrative and clinical databases between 2009 and 2014 ($n=93,331$ Ontario; $n=10,599$ Saskatchewan). Predictors of ChEI/memantine use were assessed using logistic regression models adjusted for clustering in the nursing home. Predictors included: sociodemographic factors (i.e. age, sex, income, urban/rural residence, marital status); health status (i.e. frailty status based on a 70-item frailty index, level of cognitive impairment, aggressive behaviours, comorbidities); and recent use of other prescription medications.

Results: At admission to nursing home, 8.1% of Saskatchewan residents received a ChEI/memantine compared to 33.2% in Ontario. Ontario and Saskatchewan residents receiving ChEIs/memantine were of similar age (mean 84 years), while Ontario residents were more likely to be female (65.7% vs. 60.5%) and were less likely to live in a rural area (13% vs. 42.9%). Ontario residents were more frail and were more likely to have severe aggressive behaviours, whereas Saskatchewan residents had more severe cognitive impairment. In both provinces, predictors of receipt of ChEIs/memantine at admission included older age (75-84 years), severe cognitive impairment and aggressive behaviours, and recent antipsychotic use. Similarly, factors associated with a lower likelihood of receipt included; unmarried marital status, increased frailty, and a higher number of hospitalizations in the previous year. The magnitude and direction of effect of rural residence, number of concurrent medications, and receipt of anticholinergic medications differed between the provinces.

Conclusion: Saskatchewan's more restrictive policies on ChEIs/memantine reimbursement resulted in a smaller proportion of individuals receiving ChEIs/memantine and different predictors of use. A comparison of predictors of drug use across jurisdictions enables an evaluation the impact of more restrictive reimbursement policies. Future work should examine health outcomes associated with more and less restrictive use of ChEIs/memantine.

Classification system for electronic medication adherence products

Tejal Patel ¹, Jessica Ivo ¹, Sadaf Faisal ¹, Aidan McDougall ², Jillian Bauer ³, Sarah Pritchard ³, Feng Chang ¹

¹ University of Waterloo School of Pharmacy

² University of Waterloo Faculty of Applied Health Sciences

³ Centre for Family Medicine Family Health Team

Background/Objectives: Many electronic medication adherence products (eMAPs), with varying features, are available to support medication management in older adults. Classification of eMAPs based on key features could be used to determine which products are appropriate based on patient needs and limitations, such as cognitive impairment, in medication management. However, no such classification system exists. The objective of this project was to validate a classification system for eMAPs based on key features.

Methods: Healthcare professionals were invited to examine key features which could be used to classify these eMAPs into separate categories. Participants were then invited to indicate their level of agreement with inclusion of these features as appropriate and key to classifying eMAP categories. Key features used classify the types of eMAPS were: Automatic Pill Dispensers (3 key features: compartments hold >1 medication;

automated dispensing; locking), Electronic Blister Packages (2 key features: records the time opened; storage similar design to blister pack), Clock Caps (2 key features: compartment for one medication; records time device was opened), Pill Boxes with Alarms (2 key features: compartments hold >1 medication; alarms), and Reminder Alarms (1 key feature: alarms). Features with <70% agreement for the appropriateness were reviewed for removal or modification by the project team. Additional comments provided by participants were also reviewed and considered when modifying features used to classify products.

Results: Each of the 11 participants (82% female; mean age and years of practice: 32.9 and 8.82 years, respectively) tested 5 of 22 products. Of the features used to classify products, two fell below the 70% agreement for appropriateness. One feature, from the Automatic Pill Dispenser, "The device has a locking feature," (key feature 73% and appropriateness 64%) was removed while another feature for the Electronic Blister Package, "The device records the last time the device was opened," (key feature 64% and appropriateness 55%) was discussed and modified. This feature was not removed as it was the only feature which distinguished electronic blister packages from generic blister packages. Percent agreement for the remaining features for both importance and appropriateness ranged from 73 - 100%. Four Additional features were modified for clarity based on participant feedback.

Conclusion: The classification of electronic medication adherence products is an important step in enabling clinicians to further understand key attributes of these aids. These can then be used to recommend these aids to patients, based on limitations they may be experiencing in medication management as well as their expectations of adherence aids.

Electronic medication adherence products: A clinician tool to guide use

Tejal Patel ¹, Jessica Ivo ¹, Aidan McDougall ², Sadaf Faisal ¹, Jillian Bauer ³, Sarah Pritchard ³, Feng Chang ¹

¹ University of Waterloo School of Pharmacy

² University of Waterloo Faculty of Applied Health Sciences

³ Centre for Family Medicine Family Health Team

Background/Objectives: There is an increasing risk of medication non-adherence and misadventures with aging. Providing older adults with strategies that enable medication management is of significant importance, as it allows continued independent living. Recently, numerous electronic medication adherence products (eMAPs), such as electronic blister packages, have become available to aid medication taking. However, there are no guidelines available to support clinicians in recommending eMAPs. Therefore, the objective of this study was to create and validate a tool to guide use of eMAPs based on product specific features, as well as usability and workload required by older adults to use a product.

Methods: Healthcare professionals were invited to participate in a focus group to provide feedback on 5 factors to be included in the tool: unassisted task completion, efficiency, usability, workload and an overall eMAP score. Participants were asked semi-structured and probing questions during the focus group to elicit their feedback about the tool, including questions pertaining to the use of the different factors in the tool; information on the usability, workload and efficiency of the products; if the tool accurately represented their experience with using the products; if and how they would use this tool to inform recommendations of medication adherence aids to patients, and; if there were any additional factors that should be reported within the tool to inform decision making. Feedback from the focus group was analyzed by the research team and revisions were made accordingly. The discussions were audio-recorded and transcribed verbatim, after which transcripts were analyzed qualitatively.

Results: Twelve individuals attended the focus group, including 5 pharmacists who had tested the products in usability testing, and 6 research team members (3 pharmacists, and 3 research assistants). Of the 5 pharmacists, 80% were female with an average of 15.8 years in practice (range: 5-37). Of the original 5 factors, 2 were removed (efficiency, and electronic medication adherence product score), 8 were added (maximum number of alarms, number of days products can accommodate for based on a daily dosing regimen, price, monthly subscription, portability, locking feature, average time to set device) and 1 was modified (calculation of the unassisted task completion). Based on suggestions provided by participants, additional instructions for using the guide and specific patient case examples were included to guide the appropriate use of the tool.

Conclusion: Since significant variability exists between electronic medication adherence products, it is imperative to have a tool for frontline clinicians to aid in decision making related to the recommendation of these products to address medication management in older adults. A tool which includes usability, workload and product specific features will ensure that clinicians are aware of the capabilities of a specific eMAPs and its appropriateness for a particular patient prior to recommending it to improve medication management.

Cholinesterase inhibitor use in dementia: effect on cardiovascular conduction

Tejal Patel¹, Deval Mehta¹, Ali Syed², Caitlin Carter¹, Shaambhavi Sharma³, Sadaf Faisal¹, Jeff Nagge¹, Jillian Bauer⁴

¹ University of Waterloo School of Pharmacy

² Hamilton Health Sciences

³ University of Waterloo Applied Health Sciences

⁴ Centre for Family Medicine Family Health Team

Background/Objectives: Acetylcholinesterase inhibitors (AChEI's) are used to improve cognitive function of patients with Alzheimer's disease and related dementias; however, they are posited to have significant cardiac adverse effects. While the effect of acetylcholinesterase inhibitors on syncope is well known, it is not yet established whether they have an effect on PR and QT intervals, and cause torsades de pointes (TdP). The primary objective of this study was to conduct a systematic review to investigate the effect of acetylcholinesterase inhibitors on cardiac conduction, particularly PR, QT intervals and heart rate and occurrence of TdP.

Methods: A comprehensive search was conducted in PubMed (MEDLINE), Ovid Embase, Cochrane Library, Ovid International Pharmaceutical Abstracts, and Scopus from inception until June 2016, updated in February 2018. The search strategies included subject headings and keywords related to AChEIs, dementia, and cardiac conduction. Two team members screened the results based on eligibility criteria; discrepancies were resolved by further discussion. Reports were included if it focused on patient(s) with a diagnosis of dementia who received an AChEI. Studies were excluded if they did not report cardiac adverse events, were conducted in animal models, or were expert opinion, clinical review, commentary, editorial or systematic review. Study methodology, intervention, study duration, sample size, country, comorbidities, patient demographics, diagnosis, pre- and post-drug QTc, PR, HR and TdP were extracted. Primary outcomes were changes in QTc and PR intervals and HR from baseline, and the occurrence of TdP. The risk of bias was also assessed.

Results: The search yielded 7644 results with 2571 duplicated. Of the remaining 5073 results, 454 articles underwent full-text review, and 23 articles met eligibility criteria and were included in data abstraction and analysis. Of the four randomized-controlled trials (RCTs) and one post-hoc analysis of four RCTs, all reported on changes in QTc interval, of which one was clinically significant; four on PR interval and three on HR, none of which were clinically significant. Of the six cohort studies, five reported on QTc interval, of which one clinically significant; six reported on PR interval (none clinically significant); and four reported on HR (one clinically significant). Of the 12 case reports (CR), nine reported on QTc interval (six were clinically significant); six reported on PR interval (two clinically significant); and 11 reported on HR (six clinically significant). Five CRs documented TdP associated with the use of AChEIs.

Conclusion: Although RCT suggest AChEIs have non-clinically significant changes on QTc and PR intervals and HR, evidence from cohort and case reports highlight potentially clinically relevant cardiac effects, especially in the occurrence of TdP in patients with risk factors. Non-clinically significant changes reported in RCT may potentially result from inclusion of healthier patients with dementia. Close monitoring of ECG parameters may be required in patients with risk factors that increase the risk of TdP.

The paradox of dementia and driving cessation

Gary Naglie¹, Elaine Stasiulis¹, Stephanie Yamin², Brenda Vrkljan³, Holly Tuokko⁴, Sarah Sanford¹, Michelle Porter⁵, Jan Polgar⁶, Anita Myers⁷, Paige Moorhouse⁸, Frank Molnar⁹, Barbara Mazer¹⁰, Shawn Marshall⁹, Isabelle Gélinas¹⁰, Alexander Crizzle¹¹, Anna Byszewski⁹, Patricia Belchior¹⁰, Michel Bédard¹², Mark Rapoport¹³

¹ Baycrest Health Sciences

² St. Paul University

³ McMaster University

⁴ University of Victoria

⁵ University of Manitoba

⁶ Western University

⁷ University of Waterloo

⁸ Dalhousie University

⁹ University of Ottawa

¹⁰ McGill University

¹¹ University of Saskatchewan

¹² Lakehead University

¹³ Sunnybrook Health Sciences

Background/Objectives: Driving cessation in dementia is well established in the older adult and dementia literature as being a complex and difficult decision and transition for drivers and their family members to make. To support individuals through the process of decision-making and transitioning to non-driving we developed the Driving Cessation in Dementia Resource Toolkit (DCDRT). As part of our on-going research involving key stakeholders in the further development of the DCDRT, our objective was to examine the context-specific factors that are relevant to its effective implementation in settings that support older adults with dementia.

Methods: A qualitative description approach was used to explore the perspectives of Alzheimer Society (AS) staff in their work of supporting persons with dementia and family caregivers within the context of driving cessation. Individual in-depth interviews were conducted with staff members from AS organizations in four Canadian provinces. Participants were asked to describe the key challenges facing current and former drivers with dementia and their family caregivers in their local areas. Data were examined using interpretative thematic analysis.

Results: In total 15 AS staff members participated in the study, including eight participants from four different sites in Ontario, three from two sites in British Columbia, two from two sites in Manitoba and two from one site in Nova Scotia. All performed functions in overseeing or delivering education and support to persons with dementia, family caregivers and healthcare providers. Study findings revealed an over-arching paradox that despite the recognized importance of driving cessation in people with dementia it often continues to be avoided as a topic of discussion at the individual level and to

be neglected at the system level. We outline this paradox in the following themes: 1) how it is recognized in AS settings as a “hot” topic, but is met with resistance; 2) how a lack of awareness and understanding about dementia contributes to fear and avoidance; 3) how distress and avoidance are rooted in on-going

Conclusion: Despite more than two decades of research documenting challenges related to driving cessation in dementia and the considerable distress it causes individuals with dementia and family caregivers, addressing driving cessation continues to remain on the “back burner” and requires more attention at the individual, family and system levels.

Interdisciplinary primary health care approaches to dementia and chronic conditions: a case study

Amanda Froehlich Chow, Debra Morgan, Julie Kosteniuk, Melanie Bayly, Valerie Elliot, Megan O’Connell
University of Saskatchewan

Background/Objectives: Employing interdisciplinary collaborative team-based approaches is recognized as best practise for delivering effective care for people living with dementia. However, little is known about the strategies for team-based dementia and chronic disease care, particularly in rural settings. Study objectives aimed to explore collaborative care approaches employed among rural Primary Health Care (PHC) teams delivering care to older adults living with dementia and other chronic conditions. PHC team members’ perceptions of unique barriers and facilitators affecting collaborative care in rural settings were investigated. This project is part of a larger study led by the Rural Dementia Action Research (RaDAR) Team.

Methods: A community-based participatory research with a case study design was used with 3 rural PHC teams from southern Saskatchewan as participants. PHC team members’ experiences and strategies associated with collaborative care was assessed via one-on-one interviews with key informants. In addition, document review of annual survey data collected by PHC facilitators provided information about participant experiences and insight into how PHC teams collaborate. Thematic analysis was employed to identify types of collaborate care strategies and factors influencing team-based care in rural areas. Analysis of annual survey data was used to confirm or refute themes identified in the interview data.

Results: Key themes identified to describe factors that affect how PHC team members work together included: collaborative versus coordinated care approaches; flexibility in implementing and adapting collaborative strategies; and establishing a close working relationship among all team members. Additionally, various factors associated with being rurally located were identified as both enhancing and hindering the

capacity of PHC teams to engage in interdisciplinary collaborative care for older adults living with dementia and other chronic conditions.

Conclusion: The findings from this project address a gap in the literature associated with understanding how rural PHC teams engage in collaborative care. Further, this research enhances knowledge about the impacts of geographic locale (specifically rural settings) on interdisciplinary collaborative care approaches for dementia and other chronic conditions. Moving forward, this work will inform the larger RaDAR study, aimed at developing a PHC model for dementia in rural communities. Collaborative care strategies can be incorporated and evaluated for effectiveness as part of the RaDAR teams' commitment to developing a model for supporting the delivery of comprehensive, integrated rural PHC for dementia.

The Annual Summit of the Knowledge Network in Rural and Remote Dementia Care: An Example of an Integrated Knowledge Translation (iKT) Approach

*Debra Morgan, Julie Kosteniuk, Megan E. O'Connell, Andrew Kirk, Allison Cammer, Duane Minish, Valerie Elliot
University of Saskatchewan*

Background/Objectives: This presentation reports the processes and outcomes of an ongoing stakeholder engagement strategy that guides the Rural Dementia Action Research (RaDAR) program in Saskatchewan. A RaDAR Decision-Maker Advisory Council was formed in 2008. Council members agreed an annual face-to-face meeting was essential for active participation and the first Rural Dementia Summit was held in 2008. The Council evolved into The Knowledge Network in Rural and Remote Dementia Care, and includes people with dementia, family members, health care providers, administrators, Ministry of Health representatives, the Alzheimer Society of SK, researchers, and trainees.

Methods: The Summit involves an evening scientific poster session followed by a one-day knowledge exchange meeting. Presentations, panel discussions, small group work, and educational sessions engage participants in decision-making about research. Data from evaluations conducted at each of the eleven Summits were synthesized, followed by quantitative and qualitative evaluation. Focus group data from the 10th Summit, gathered to guide planning for future Summits, were described and qualitative findings were grouped thematically.

Results: Summit attendance has increased from 32 in 2008 to 110 in 2018. Over the 11-year period participants were highly satisfied with the poster session evening and Summit day. Poster session participants agreed that they received good value for their time (98-100%) and an opportunity to learn about rural dementia care research and projects (96-100%) as well as interact with researchers (97-100%) and others interested in

dementia care (97-100%). Summit day attendees agreed that the event gave them an opportunity to share their opinions and ideas (95-100%) and increase their knowledge about rural dementia care (95-96%). The majority of Summit participants agreed that it was worth their time to attend (95-100%) and wanted to attend again (96%). Seven themes emerged from the qualitative data: format (inviting and organized), representation (interprofessional and multidisciplinary), learning (evidence-based research and services), networking (building connections/relationships), impact (stakeholders), motivation (inspiring/hopeful), and structure (letting voices be heard).

Conclusion: The Summit provides meaningful stakeholder engagement in the RaDAR program of research, but participants report impacts beyond the original aim of guiding RaDAR's research program including bringing research evidence into practice. Stakeholder engagement in healthcare research is an important strategy to address the research-to-practice gap, by enhancing research relevance and quality and increasing the use of research results. Integrated knowledge translation (iKT) involves a meaningful, sustained, active partnership throughout the research process, co-producing knowledge and translating it into action. This Summit provides an example of an effective, ongoing engagement strategy useful for others planning iKT research.

Caregiving in secrecy: The journey of being a caregiver for a person with dementia

Linda Yetman¹, Margaret Stephenson², Rose McCloskey³, Mansa Agbaku⁴, Pamela Jarrett¹

¹ Horizon Health Network

² Dalhousie Medicine New Brunswick

³ University of New Brunswick, Saint John, Dept of Nursing & Health Sciences

⁴ University of New Brunswick, Fredericton

Background/Objectives: Many individuals with dementia are cared for by family and friends. Caregiving is often fraught with stress, burden and uncertainty. With the increasing prevalence of dementia in Canada, understanding the caregiving experience is crucial to identify meaningful interventions and support for caregivers. The purpose of this research was to explore the experience of informal caregivers for persons with dementia.

Methods: A descriptive-exploratory method was used to discover the experiences of caregivers through semi-structured interviews. Ten participants were recruited from an Outpatient Geriatric Medicine Clinic. Content analysis was used to code and generate themes from interview data following verbatim transcription.

Results: An overarching theme of 'Down this Journey...Into Dementia...Keeping Secrets' with three sub-themes were

generated from the data: Reluctant acceptance, Maintaining vigilance, and Looking forward fearfully. 'Keeping secrets' refers to the way of life that caregivers developed in caring for a person with dementia. This way of life included an air of secrecy within the context of feeling obligated and resentful (Reluctant acceptance); trying to maintain normalcy and personhood of the person with dementia (Maintaining vigilance), coping with the stressors of caregiving, including real and anticipatory losses (Looking forward fearfully). A major finding threaded throughout the sub-themes was the impact of stigmatization and its relationship to 'keeping secrets'.

Conclusion: Stigmatization is a multi-faceted phenomenon associated with caregiving in dementia care; it is felt in many settings and across cultures. Less known is the impact of 'Keeping Secrets' related to experiences/feelings of stigmatization and health outcomes of both persons living with dementia and their caregivers. Further research is warranted to understand this impact.

Crossing the Culture Divide between a Tertiary Care Psychiatric Hospital and a Community Geriatric Mental Health Clinic

Jennifer Cavanagh¹, Adele Loncar², Vickie Demers¹,
Linda Gobessi¹, Vinay Lodha²

¹ GPCSO

² The Royal Ottawa

Background/Objectives: Outline the history of GPCSO (Geriatric Psychiatry Community Services of Ottawa) and The Royal that lead to a collaborative uptake of a centralized intake service (CIS) Summarize how the Lean process facilitated efficient practices of a CIS. Describe the evaluation framework that will lend itself to identify the benefits of a CIS. Identify potential future collaborative opportunities outside of current practice which better serve the patient population.

Methods: CIS had to be created within operational resources (No new funding allocated) It was recognized that for a CIS to be implemented we had to do more with less by eliminating waste. The use of Lean principles has demonstrated success in Healthcare in many countries around the world.[2] We undertook a Lean review and value stream mapping (VSM) to design the ideal future state of a centralized intake process for outpatient geriatric psychiatry services in Ottawa

Results: MOU between the two organizations Improved access to urgent consultation Increased access to specialized services Common referral criteria and triage process leads to equitable access to services. Increased collaboration between The Royal and GPCSO allowing all clients access to the service that best meets their needs. Access to multi-disciplinary treatment team at The Royal by GPCSO psychiatrists Access to The Royal's EMR for GPCSO psychiatrists Improved

access to Case Management by psychiatrists at The Royal Improved system navigation Single point of contact for referrals to out-patient geriatric psychiatry services in Ottawa. Easier communication with referral sources, enhancing previously established relationships. Referrals that would be better served by other services are redirected to the most appropriate service quickly and efficiently. Single point of contact for information on Geri-Ψ services for community partners, caregivers, and referral partners.

Conclusion: Clear communication and a common vision is instrumental in ensuring the success of this initiative. Collaboration is worthwhile and can improve client care, but takes time and effort. Working together on a shared initiative as significant as a CIS develops trust and understanding resulting in stronger, healthier relationships.

Digital tools for delivery of dementia education for health-care providers: A systematic review

Andrea Scerbe¹, Megan O'Connell¹, Arlene Astell²,
Debra Morgan¹, Julie Kosteniuk¹, Andrea DesRoches¹

¹ University of Saskatchewan

² University of Toronto

Background/Objectives: Early dementia diagnosis has benefits for well-being by establishing appropriate care and allowing individuals to participate in own care planning. Lack of dementia knowledge in primary healthcare can delay appropriate diagnosis and care while continuing education can reduce such diagnostic obstacles by enhancing knowledge. Digitally-based continuing dementia education can have equivalent benefits to face-to-face learning, and has added benefits of scalability, accessibility and reach. This systematic review was designed to define, summarize, and delineate outcomes of technology-based dementia education for primary healthcare providers.

Methods: The systematic review used Cochrane methods and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The search focused on types of digitally-delivered resources on dementia, relevant characteristics of healthcare providers accessing resources, and measurement and effects of intended/observed outcomes. The search focused on studies with a pre- and post-intervention evaluation, where technology-based delivery of dementia education was broadly defined as any technology-based medium - online, DVD, interactive classes- delivered in real time, or asynchronously. The databases were chosen in consultation with a research librarian with expertise in systematic reviews and psychology. Risk of bias was rated independently by each reviewer as low, medium, or high, and the study quality review was performed using adapted checklists from Critical Appraisal Skills Programme (CASP) criteria. The data screening, extraction, and analysis process occurred with three

reviewers, one of whom resolved disagreements between two primary reviewers.

Results: The review identified 10 studies meeting inclusion criteria, which were qualitatively examined via content analysis to identify relevant themes and outcomes. The majority of the studies ($n = 7$) included single intervention groups with pre and post-intervention measures, while only 3 studies included randomized controlled trials. Use of the CASP criteria demonstrated medium to high quality of research, signifying that most studies focused on chosen populations of interest and included thorough reporting of outcomes. The systematic review revealed positive outcomes of digitally-based interventions on dementia diagnostic knowledge and care skills, readiness to change practice, and receptiveness to training.

Conclusion: The review revealed a diversity of digitally-based dementia education interventions which used a variety of delivery methods, such as videos, recordings, expert testimonies, textual presentation, and online discussion boards. While not all measures used to assess change in outcomes were validated, all of the interventions showed positive effects on learning. The delivery format was notably flexible in its ability to deliver education to remote areas. The remote delivery method holds a special advantage for rural healthcare providers who face work isolation and lack access to training and may be useful in designing dementia education interventions for rural professionals.

Digital tools for delivery of dementia education for informal caregivers of persons with dementia: A systematic review and meta-analysis

Andrea Scerbe¹, Megan O'Connell¹, Arlene Astell²,
Debra Morgan¹, Julie Kosteniuk¹, Andrea DesRoches¹,
Ivan Panyavin¹

¹ University of Saskatchewan

² University of Toronto

Background/Objectives: Informal caregivers of individuals with dementia face daily challenges in caregiving duties, which have been noted to negatively impact dementia management competence, perceived burden, and care. Challenges include lack of support and information, barriers to obtaining information, and personal consequences including heightened frustration, anxiety and burnout. Dementia education for informal caregivers, including digitally-based delivery, appears to increase care management and increase social support-seeking behaviours, digitally-based dementia education appears equally beneficial. The present systematic review and meta-analysis sought to identify, summarize, and present outcomes of digitally-based dementia education for informal care providers.

Methods: The systematic review and meta-analysis of studies of remotely-delivered dementia education for informal

caregivers used Cochrane methods and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The systematic search encompassed research of digitally-delivered dementia education interventions that included pre-and post-intervention measures of outcomes. Technology-based interventions were defined as any remotely delivered, synchronous or asynchronous educational dementia intervention. The relevant databases were selected in consultation with a research librarian with expertise in systematic reviews and psychology and included PsychINFO, MEDLINE, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Sociological Abstract, SocIND, AgeLine, Anthropology plus, and Embase. The study selection, data extraction, evaluation of the risk of bias, study quality-GRADE (for studies included in the meta-analysis), and CASP (for studies not included in the meta-analysis), occurred in duplicate by two reviewers, with a third reviewer available to resolve disagreements.

Results: The review identified 25 studies, of which 19 studies used randomized controlled trials (RCTs), and 6 studies used a single group pre-and post-intervention design. Studies with the same outcome measures were included in a meta-analysis. A large number of studies were rated with unknown risk of bias due to failure to report randomization ($n = 12$), or concealment of allocated condition ($n = 15$), or reporting blinding of the condition at outcome level ($n = 18$) or participant level ($n = 13$). Quality of meta-analyzed studies, using GRADE criteria revealed low to very low confidence due to heterogeneity in results and high publication bias. The CASP criteria used to assess outcome measures for non-meta-analyzed studies revealed medium to high quality of research. The meta-analysis revealed a small effect of interventions on depression and positive aspects of caregiving and a medium effect on caregiver distress.

Conclusion: This review identifies five benefits of digital education for informal caregivers: increased dementia knowledge, utilization of care strategies, symptom management, respite seeking, and use of community resources. The meta-analysis revealed small to moderate effects on reducing depression and distress and improving positive aspects of caregiving, but no effect on caregiver burden or self-efficacy. Finally, the review revealed a lack of studies focusing on rural caregivers. Digital tools for dementia education can be leveraged to provide accessible intervention for rural populations.

Applied Behaviour Analysis for Dementia Care: Welcoming Behaviour Therapy into Geriatric Psychiatry

Adele Loncar, Nick Feltz
The Royal Ottawa

Background/Objectives: The Champlain Behavioural Support System received additional BSO funding August 2016,

and with direction from Champlain LHIN came the development of the Behaviour Therapy (BT) program at the Royal. The Behaviour Therapists are integrated within the collaborative model of Geriatric Psychiatry Outreach and BSO teams in long-term care homes (LTCHs) across the Champlain LHIN; a new discipline within this field.

Results: Behaviour Therapy provides evidence based services to improve the quality of life for the populations in which we serve. It relies on the evidence based practices of Applied Behaviour Analysis (ABA) and the ethical guidelines of the Behaviour Analyst Certification Board (BACB) to assess, modify, and monitor ongoing behaviour change. The principal interests of BT services include operationalizing operant behaviour, using objective data to monitor the behaviour of interest, assessing the current environment influencing said behaviour, and creating treatment plans to modify the environment, thus promoting positive behavioural change. This discipline within Geriatric Psychiatry embodies a non-pharmacological and collaborative model approached while focusing on building capacity within the LTCHs while focusing on reducing specific responsive behaviours through environmental manipulation.

Conclusion: This new discipline within Dementia care is yielding promising results in effectively reducing responsive behaviours in non-pharmacological mean. An exhaustive evaluation of this new program is underway.

Evaluation of interdisciplinary team-based dementia assessment and diagnosis in rural primary health care: Patient and family perspectives

*Melanie Bayly, Debra Morgan, Julie Kosteniuk, Amanda Froehlich Chow, Valerie Elliot
University of Saskatchewan*

Background/Objectives: The diagnosis and management of dementia may be best achieved within primary care, particularly in rural communities where human resources and specialized services are limited. The RaDAR team has been working to increase the capacity of rural primary health care providers through operationalizing best practices in dementia diagnosis and management. This work includes the establishment of interdisciplinary rural memory clinics, which were developed and implemented in partnership with three rural Saskatchewan primary health care (PHC) teams. The objective of the current research is to explore the assessment and diagnosis experiences of patients and families attending the monthly memory clinics.

Methods: A mixed methods multiple case study is underway as part of a larger process evaluation. Three research questions were posed: 1) What are the experiences of patients and families receiving memory clinic care?; 2) How do they perceive the team-based processes?; and 3) How can care be further

improved? Patients and their support individuals attending the rural memory clinics are invited to complete a short mail-in questionnaire or/and a 30 minute telephone interview either jointly or individually about their experiences. To date, 21 individuals (7 people with dementia and 14 family member/friend supporters) have provided feedback via questionnaire (n=10) or semi-structured interview (n=4). The questionnaire includes ten Likert scale questions (1=Strongly Disagree to 5=Strongly Agree), in addition to open-ended questions about participants' experiences and how they could have been improved. Preliminary quantitative data were analyzed through descriptive statistics, and thematic analysis was employed with open-ended questions and interview data.

Results: Respondents agreed the half-day assessment was not too lengthy (M=3.90), involved a thorough explanation of results (M=4.40) and available treatments (M=4.10), and increased knowledge about the condition's course (M=3.90) and appropriate supports/services (M=4.20). Respondents emphasized the convenience of a rural-based clinic, and being heard which was facilitated by the team-based approach, kind and respectful interactions, and clinic duration. Respondents felt free to discuss their concerns (M=4.80) and perceived the PHC team to be sensitive to their feelings (M=4.50). Getting everyone in the same room and on the same page was valued by respondents, who found it helpful to meet with the whole PHC team (M=4.50); participants appreciated their combined expertise and perceived them to have respect, confidence, and trust in one another (M=4.60). The clinic could be improved by increasing information and communication; providing more information on the condition (M=2.6) and the clinic/assessment processes, and ensuring timely follow-up post-clinic.

Conclusion: Experiences with the rural memory clinics were very positive. Preliminary findings offer insight into how patients and families perceive the team-based rural memory clinics, and suggest key elements to their success such as positive team functioning, a patient/family centered approach, and informative communication. These findings are important for the development of team-based dementia care and further refinement of the rural PHC memory clinic.

ArtOnTheBrain: Promoting cognitive training in older adults with low vision with an arts-based mobile health solution

*Walter Wittich¹, Gabrielle Aubin¹, Mariah Hogan¹, Swathi Swaminathan², Navena Lingum², Aviva Altschuler², Kelly Murphy²
¹ Université de Montreal
² Baycrest Health Sciences*

Background/Objectives: The ArtOnTheBrain (AotB) application is a new visual arts-based tool that promotes brain health and aims to bringing leisure activities into the home

of older adults who may otherwise be unable to attend such activities. It has been used as a cognitive engagement tool and enables the user to learn about pieces of artwork, play related games, and mingle with others on-line who use the application while exploring visual artworks from international museums. The purpose of this study was to establish the barriers and facilitators associated with the usability of the AotB application for older adults with a visual impairment.

Methods: The 15 participants (age range 65 to 93 years, Mage = 78.24, SD = 8.84) were recruited through vision rehabilitation centres in the Montreal region. Using the Concurrent Think Aloud method, they were asked to comment on their experience with the application while they interacted with the “Learn” (e.g.: access text descriptions, find the magnification, etc.), “Play” (e.g.: engage in puzzle and storytelling games.), and “Mingle” (rating artwork, posting comments) sections of the application. Using a qualitative approach, a thematic analysis was conducted on the verbatim transcriptions of the sessions in order to establish a coding scheme of the barriers and facilitators to the usability of the AotB application.

Results: The three main barriers categories that emerged from the data were App Interface (e.g., magnification tool not always working), App Function (e.g., app crashes at time) and Personal Factors (e.g., inexperience with touch screen interface). Additionally, the two main facilitators categories that were identified were App Features (e.g., available audio description) and the general perception of the App (e.g., intuitive and easy to use).

Conclusion: The facilitators were mostly positive feelings about the application as a whole rather than specific aspects of the app. However, the barriers, if improved, could easily become facilitators. For example, some of the personal barriers (i.e.: participants’ own technological skills) could be reduced through improvement of the app interface and function. In addition, proper functioning of the magnification feature could diminish the need for assistance. Additionally, improvement of some of the application’s interface, notably its visual features (e.g.: size of text & contrast) could also eliminate the barriers associated specifically with visual impairment.

The onset of new sensory impairments is associated with worsening cognitive status and difficulties with communication among older home care clients in Ontario

Dawn Guthrie¹, Nicole Williams², Jennifer Campos³, Paul Mick⁴, Joseph B. Orange⁵, M. Kathleen Pichora-Fuller⁶, Walter Wittich⁷, Marie Y. Savundranayagam⁸, Natalie A. Phillips⁹

¹ Dept. of Kinesiology and Physical Education and Dept. of Health Sciences, Wilfrid Laurier University

² Dept. of Kinesiology and Physical Education, Wilfrid Laurier University

³ Toronto Rehabilitation Institute - University Health Network and Dept. of Psychology, University of Toronto

⁴ Dept. of Surgery, University of Saskatchewan

⁵ School of Communication Sciences and Disorders, Western University

⁶ Dept. of Psychology, University of Toronto--Mississauga

⁷ School of Optometry, University of Montreal and CRIR/MAB-Mackay Rehabilitation Centre of West-Central Montreal Health

⁸ School of Health Studies, Western University

⁹ Dept. of Psychology, Concordia University

Background/Objectives: Older adults are likely to experience losses in sensory and cognitive functioning. However, little is known about sensory-cognitive links in the population receiving home care. Our main objective was to understand how the onset of a new single or dual sensory impairment influenced cognitive status and several other outcomes.

Methods: We analyzed data collected using the Resident Assessment Instrument for Home Care for older (65+) clients. The baseline (T1) assessment was compared with subsequent assessments to identify the first point in time when a new sensory impairment occurred (T2). Cognitive impairment (CI) was defined as a score of one or higher on the Cognitive Performance Scale (CPS). We tracked five unique cohorts: 1) no sensory impairments at both T1 and T2 (n=47,479); 2) existing hearing impairment (HI) and development of a new vision impairment (VI) (n=9,094); 3) existing vision impairment (VI) and development of a new HI (n= 4,684); 4) no baseline impairments who developed both VI and HI (dual sensory impairment or DSI; n= 3,274); and 5) persistent DSI at both T1 and T2 (n=22,131). A standardized difference (stdiff) of 0.2 or higher (absolute value) between proportions was used to identify a statistically meaningful effect size.

Results: At baseline, those with persistent DSI were the most likely to have CI (77.1%) versus 54.2% (stdiff= -0.50) among those with no sensory impairments. Individuals who developed new DSI were the most likely (57.7%), among the five cohorts, to experience a worsening in their cognitive status, defined as any one-point increase on the CPS. This proportion was similar to those with new HI or new VI (roughly 50%; stdiff=-0.15) and was significantly higher when compared to those with no sensory challenges at 34.6% (stdiff= -0.48). At baseline, the persistent DSI group had the highest rate of difficulty.

Conclusion: Older home care clients with newly developed sensory impairments are at increased risk for further cognitive decline and difficulties in communication. This was particularly true among those experiencing the onset of a dual sensory impairment. Our findings reinforce the importance of assessment and monitoring in these older individuals in order to flag early sensory changes so that evidence-based interventions can be implemented to try and delay further losses.

Hearing loss is associated with hippocampal atrophy in older adults at risk for dementia

Nathalie Giroud¹, Kathy Pichora-Fuller², Paul Mick³, Walter Wittich⁴, Faisal Al-Yawer¹, Sana Rehan¹, Natalie Phillips¹

¹ Concordia University

² University of Toronto

³ University of British Columbia

⁴ University of Montréal

Background/Objectives: Hearing loss (HL) in older adults has been associated with cognitive decline and higher risk for dementia. However, the underlying link with brain structure remains largely unknown.

Methods: Using data from the COMPASS-ND dataset, a large-scale Canadian study on dementia, we investigated the relationship between HL as measured by a) HL category based on pure-tone thresholds at 2kHz and b) speech-in-noise reception thresholds using the Canadian Digit Triplet Test (CDTT) and cortical volume, while controlling for education, age, sex, and intracortical volume in older adults with different degrees of cognitive impairment, namely subjective cognitive impairment (SCI, N=35), mild cognitive impairment (MCI, N=79), and Alzheimer’s dementia (AD, N=21).

Results: HL category was not different between diagnostic groups, while the AD group performed worse in the CDTT compared to the SCI group. Furthermore, gray matter volume was lowest in AD and highest in SCI in all extracted cortical brain regions. Greater HL (i.e., higher HL category) was associated with lower volume in the right hippocampus, but only in the SCI group. In other words, SCI participants with moderate to severe HL had 4% lower volume in right hippocampus than those with no or mild HL. Lower performance in the CDTT was associated with lower gray matter volume in bilateral frontal, temporal, and parietal regions as well as the right occipital lobe in the AD group.

Conclusion: Given the relationship between HL and cortical atrophy, our research implicates that modifying HL in older adults who are at risk for developing AD might reduce the risk for cognitive decline and increase their brain health. Furthermore, developing novel interventions for speech perception deficits in older adults with AD might be a way to improve their hearing and therefore their overall quality of life. As a next step, longitudinal data will be analyzed in order to investigate causal relationships between HL, speech in noise perception, and brain structure in older adults with (or at risk for) dementia.

Sensory loss and cognitive function in older adults at different stages of cognitive impairment

Faisal Al-Yawer¹, M. Kathleen Pichora-Fuller², Walter

Wittich³, Paul Mick⁴, Nathalie Giroud¹, Sana Rehan¹, Natalie Phillips¹

¹ Concordia University

² University of Toronto

³ University of Montreal

⁴ University of British Columbia

Background/Objectives: Sensory loss in older adults has been associated with declines in cognition and, in some cases, with the development of dementia. Using preliminary data from the COMPASS-ND study, we examined sensory differences (hearing, vision, olfaction) and the potential associations of sensory with cognitive function in groups with Alzheimer’s disease (AD; N=28), mild cognitive impairment (MCI; N=75), and subjective cognitive impairment (SCI; N=21).

Methods: For all participants, we obtained scores on measures of hearing (pure-tone audiometry; Canadian digit triplet test), vision (MNRead; Mars contrast sensitivity), olfaction (brief smell identification test), and cognition (Rey auditory verbal learning test; brief visuospatial memory test; vocabulary; digit span; trail making A and B). Additionally, we compared the associations between visual and auditory tests of memory in MCI individuals with normal hearing (N=40) and hearing loss (N=34).

Results: Controlling for age, sex, and education, we observed group differences in contrast sensitivity (SCI, MCI>AD; $\eta^2=.11$), and olfaction (SCI>MCI, AD; $\eta^2=.06$). There were no differences among groups in audiometric hearing loss category or speech-in-noise threshold. The SCI group scored better on most neuropsychological measures compared to the other groups, as did the MCI group compared to AD. Partial correlations were analyzed for the MCI group. Olfaction was associated with measures of memory (Rey Auditory Learning Test), and working memory (digit span). Measures of vision were associated with measures of visual attention (Trail Making A). Cognitive measures were not associated with audiometric category nor digit triplet thresholds. Finally, visual and auditory tests of memory showed an association only in individuals with normal hearing but not in those with hearing loss (normal hearing $r=0.628$, $p<0.001$; hearing loss $r=0.312$, $p=0.087$).

Conclusion: These preliminary results highlight sensory-cognitive interactions in individuals at prodromal stages of dementia. Additionally, different associations were observed between visual and auditory memory tests based on hearing status, suggesting a degree of incongruence possibly stemming from the involvement of perceptual factors in these tasks.

The association of anxio-depressive disorders and depression with motoric cognitive risk syndrome: Results from the baseline assessment of the Canadian longitudinal study on aging

Harmehr Sekhon ¹, Gilles Allali ², Olivier Beauchet ³

¹ Faculty and Department of Medicine, Division of Experimental Medicine, McGill University, Montreal, Quebec, Canada

² Department of Neurology, Geneva University Hospital and University of Geneva, Switzerland

³ Department of Medicine, Division of Geriatric Medicine, Sir Mortimer B. Davis - Jewish General Hospital and Lady Davis Institute for Medical Research, McGill University, Montreal, Quebec, Canada

Background/Objectives: Motoric cognitive risk syndrome (MCR), anxio-depressive disorders (ADD) and depression are associated with cognitive complaint and slow gait speed. The study aims to examine 1) the association of ADD and depression with MCR, and 2) the influence of the type and the severity of ADD and age on this association in older adults.

Methods: A total of 29,569 participants free from cognitive impairment with walking speed measure recruited at baseline in the Canadian Longitudinal Study on Aging (CLSA) Comprehensive were selected in this cross-sectional study. They were separated into different sub-groups based on their age groups (i.e., 45-54, 55-64, 65-74 and ≥ 75) and the presence of MCR. Anxiety, mood and depressive disorders (defined ADD) were assessed. Depression was defined by the Center for epidemiological studies - depression scale (CES-D) score ≥ 10 .

Results: The overall prevalence of MCR was 7.0% and was greater in the youngest age group (8.9%) as compared to the other age groups ($P < 0.05$). There was a higher prevalence of ADD and depression in individuals with MCR compared to those without MCR for all age groups ($P \leq 0.001$). Depression was significantly associated with MCR regardless of age-group (Odds ratio ≥ 3.65 with $P \leq 0.001$). The association of ADD with MCR depended on the accumulation of disorders and not their type, and was weaker and more inconstant in the oldest age group as compared to younger age groups.

Conclusion: MCR is associated with ADD and depression in both young and old individuals. This association is stronger for depression and younger individuals.

From Pencil to Pixel How iTAV (It Takes A Village) went from a paper based solution to an app while retaining its value and maximizing the benefits of going digital.

Chanile Vines
SE Research Centre

Background/Objectives: Smartphones are steadily changing the way we deliver health services. Today many services are looking to go digital; tapping into the benefits of better integration and faster service iTAV is an AI mobile app that guide caregivers to developing an impactful care-plan for a

person living with dementia (PLWD). It is more specific and powerful than conventional search engines, allowing people to describe in plain language what they need and to be connected to resources close to them. When adopting a digital based solution, one of the biggest hurdles is translating paper workflows to digital workflows

Methods: iTAV was conceived first as a paper based solution. The project was then funded to go from paper to app. To facilitate evidence based design and development PsychINFO, AGELINE and Google Scholar were searched from 2012-2018 for terms relating to app development in Health Care. Two reviewers independently screened titles and abstracts to determine inclusion status. A second screen of article full-text, again by two reviewers followed. Screening identified 230 papers, of which 70 met the criteria. Article data were extracted manually into a database. A Meta-analysis was completed to find a common set of attributes that could be combine to form our guiding principles when developing user friendly tech to aid PLWD. This presentation walks you through six recommended steps to successfully convert your paper based solution to a digital solution.

Results: Six core guidelines were developed to successfully take paper tools to a digital form. 1. Map out your digital flow Identify what processes translate to a digital form and what will need to change. 2. Don't be bound by paper form conventions Thinking that web forms are just paper forms recreated on a digital interface is a pitfall many developers experience. This can result in clunky, cluttered, unattractive forms with very little attention to basic usability and design 3. Replace data entry with integrations Think less transactional and more life integration 4. Perform user acceptance testing From co-design to testing; track the Effects of Your transformation. Try out new workflows, collect feedback, start small and then expand. Keep the user at the center of your design 5. Establish evaluation requirements Functionality, reliability, usability, efficiency, maintainability and portability. Decide early how will measure your success.

Conclusion: When adopting a digital based solution, one of the biggest hurdles is translating paper workflows to digital workflows. Careful consideration and planning are required to ensure success. Digital solutions can improve access, integration, and increase responsiveness of supportive resources. The App format blends navigation and browsing capabilities, common to hypermedia, with "classical" operations (or transactions), common to traditional information systems. By following the above guidelines you can effectively transition your current manual process to a streamlined digital workflow that takes full advantage of the Big- Pixel benefits.

Design and evaluation of an ecological momentary assessment tool for assessing depression in dementia

*Iulia Niculescu*¹, *Andrea Iaboni*²

¹ *University of Toronto*

² *Toronto Rehabilitation Institute*

Background/Objectives: Assessing depression in people with dementia is challenging due to limitations of retrospectivity. Mobile Ecological Momentary Assessment (EMA) provides a novel approach in assessing depressive symptoms by collecting informant measures in intervals throughout the day, decreasing recall bias and increasing representativeness. The objective of this study is to design an EMA application for assessing depression in individuals with dementia.

Methods: A literature review was conducted to determine commonly used and validated assessments for depression in dementia. Assessments were analyzed for common items, where items less commonly used (<50% of assessments sharing the item) or not relevant to be collected using EMA were excluded. Wording of items were also analyzed to develop the specific structure of questions for the EMA assessment.

Results: Six assessments were found and demonstrated adequate performance outcomes. Items fell into either mood-related, dementia-related, vegetative, psychotic or positive mood symptom groups. The mood-related group was analyzed separately for prominent items, which were sadness, anxiety, pessimism, loss of interest and irritability. Wording of items were modified to be consistent with being collected throughout the day, rather than retrospectively. These items were incorporated as core observational domains in the application to be tested. Sadness and anxiety were additionally included as self-report items as previous studies have shown these to be most discordant between individuals with dementia and informants.

Conclusion: This research provides an innovative approach in assessing depression in dementia. Future steps will involve evaluating the application's feasibility and reliability for assessing depression in individuals with dementia.

Behaviour assessment tools currently used in long term care in Canada: a survey

*Hannah Quirt*¹, *Andrea Iaboni*¹, *Marion Penko*², *Lori Schindel Martin*³

¹ *Toronto Rehab - University Health Network*

² *St. Josephs Healthcare*

³ *Ryerson University*

Background/Objectives: Many long-term care (LTC) residents have behaviour symptoms associated with dementia. At present, LTC has no standard tool to measure these symptoms outside of quarterly resident assessments. Accurate measurement of behaviour symptoms is essential to guide treatment and monitor the effect of interventions. Limitations to existing tools include the lack of training, rater bias and recall errors.

These limitations threaten their reliability and validity and create the risk inappropriate treatment of behaviour symptoms. In this study, we sought to understand which tools are used to assess behaviours in LTC, the supports available and the challenges associated with their use.

Methods: 300 LTCs across Canada were invited to participate in an on-line survey. Survey respondents were asked to reflect on uses for tools, training and support, confidence in use and challenges faced. Survey results were summarized descriptively and we examined correlations between available supports and reported confidence and challenges.

Results: Of 300 LTCs invited to participate in the survey, 103 completed the survey. Nine provinces and one territory were represented by the survey respondents. Homes reported using a mean 2.3 +/-1.2 (range 0-7) different tools. The two most commonly used tools were the Dementia Observation System (DOS) and Cohen-Mansfield Agitation Inventory (CMAI). Overall confidence in most aspects of tool use was high, with workload identified as the greatest challenge. Informal forms of training in use of the tool were common, and this correlated with less confidence in tool use.

Conclusion: There are important opportunities for improving the assessment of behaviour in LTC, including standardization, improved education and future applications of technology.

Evaluation of the adoption and the validity and reliability of the Dementia Observation System (DObs) web application in long-term care.

*Hannah Quirt*¹, *Andrea Iaboni*¹, *Mario Tsokas*¹, *Cecelia Marshall*¹, *Alastair Flint*², *Katherine McGilton*¹, *Lori Schindel Martin*³

¹ *Toronto Rehab - University Health Network*

² *Toronto General Hospital - University Health Network*

³ *Ryerson University*

Background/Objectives: Most behaviour assessment tools used in long-term care (LTC) involve retrospective reports. These assessments are prone to errors in recall and provide little opportunity to identify the context of behaviours. Furthermore, these assessments are often underused, prone to incomplete and inaccurate data collection and the results can be difficult to analyze. To address these problems, we developed Dementia Observations (DObs) mobile application for direct observation of behaviour symptoms. Direct observation of behaviour provides more detail about the frequency, duration, precipitants and patterns. This study aimed to evaluate the adoption, the validity and the reliability of DObs in the LTC setting.

Methods: Two sites were selected to participate in this study: a tertiary dementia unit and a long-term care facility. Both

sites adopted the DObs application in place of their existing behaviour assessment tool in their care routines. The DObs application prompts staff to enter behaviour observations every thirty minutes. Residents were recruited as they were identified as needing a behavioural symptom assessment. Staff were able to tailor the assessment criteria to suit the residents and used DObs to assess residents for 5-7 days. LTC staff were recruited to be observed by research staff as they used the application and to give feedback in interviews and surveys. Additionally, data from the application and resident health records were reviewed to understand how consistently observations were completed and to determine if the assessment results were considered when planning care for residents with behavioural symptoms.

Results: A total of 11 patients were observed for a total of 66 days. The average completion rate for behaviour observations was 50%, 48% in LTC and 52% in the tertiary dementia unit. Observations are missed most commonly at shift change (night to day), patient meal times, staff break times, or a complete shift. Our data showed a 95% agreement between the staff raters and the research assistant.

Conclusion: This is the first study to evaluate the use of a mobile dementia observation application in the LTC setting. There is an urgent clinical need for this type of objective assessment tool to help advance clinical practice in dementia care. There is a trade-off with real-time entry between accuracy and completeness of data. The results of this study will be used to advise the development of a clinical standard for the use of direct observation tools in the LTC environment.

Using the Consolidated Framework for Implementation Research to identify barriers and facilitators to implementation of a rural primary health care intervention for dementia

Debra Morgan¹, Julie Kosteniuk², Megan E O'Connell², Andrew Kirk², Norma J Stewart², Dallas Seitz³, Melanie Bayly², Amanda Froehlich Chow², Valerie Elliot², Jean Daku⁴, Tracy Hack⁴, Faye Hoium⁴, Deb Kennett-Russill⁴, Kristen Sauter⁴

¹ University of Saskatchewan

² University of Saskatchewan

³ Queen's University

⁴ Saskatchewan Health Authority

Background/Objectives: Background: There are growing numbers of people with dementia living in rural and remote settings. The role of primary health care (PHC) is critical in rural settings because of limited access to specialist services, yet there are few rural-specific PHC models for dementia, and little is known about factors influencing the development, implementation, and sustainability of rural PHC interventions. Using a community-based participatory research approach,

researchers collaborated with a rural PHC team to co-design and implement an evidence-based interdisciplinary rural PHC memory clinic that operationalized elements of PHC for dementia associated with positive outcomes (team-based care, decision support, specialist-to-provider support).

Methods: Methods: This presentation reports barriers and facilitators to developing and implementing the intervention before scaling up to other rural PHC teams. A qualitative longitudinal process evaluation was conducted across pre- to post-implementation. The Consolidated Framework for Implementation Research (CFIR) guided data collection and analyses. The CFIR consists of 38 constructs within five domains (intervention characteristics, outer setting, inner setting, individual characteristics, process). Data were collected via four focus groups with the PHC team and stakeholders, three smaller team workgroup meetings, interviews with four team members, and contextual data from site visit field notes and meeting minutes. An analytic team of five researchers created operational definitions of CFIR domains and constructs and used deductive analysis to code all transcripts. Inductive analysis was used to identify barriers and facilitators to implementation within each construct.

Results: Results: Fourteen CFIR constructs emerged as important to development and implementation of the rural PHC memory clinic. The domains of intervention characteristics, inner setting, and process were most important. Key implementation facilitators were the relative advantage of the intervention, ability to trial on a small scale, tension for change, leadership engagement, availability of resources including the PHC team facilitator and EMR manager, education and support provided by researchers, increased self-efficacy, and engagement of champions. Implementation barriers included complexity of multiple intervention components and the required changes in practice patterns, lack of formal incentive programs such as payments to physicians for completing assessments, time intensiveness of modifying the EMR during iterative development and testing, lack of access to EMR by all team members, lack of co-location of team members, busy clinical schedules, workload issues, inability to justify a designated dementia care manager role, and turnover of PHC team members.

Conclusion: Conclusions: The CFIR provided a structure for understanding the many influences at play when implementing a complex intervention such as the memory clinic in the complex setting of rural primary health care. The rural setting both facilitated and impeded implementation. Team members were committed to addressing community needs, and resourceful in addressing challenges. Lack of co-location and workforce availability remain ongoing barriers to team-based PHC in rural settings. We are continuing to use the CFIR to monitor sustainability and spread of the intervention to other PHC teams.

Examining the Numbers: The Continued Examination the Treatment Pathways and Frequency of Risk of Harm to Others of Individuals Referred to the Ontario Shores Long-term Care Outreach Team

*Joanna Holley, Christine Wimhurst, Janet Katchaluba, Debbie Mitchell, Elmira Severina
Ontario Shores Centre for Mental Health Sciences*

Background/Objectives: The majority of referrals into the GNOS LTC program are individuals who are exhibiting some form of verbally or physically expressive behavior. These individuals are typically identified by the referral source “threat or danger to others”, “violent” or “physically aggressive”. The GNOS LTC Outreach team members have anecdotally noticed an increase in complexity of referrals received, as well as increased risk of harm to others. It is our primary goal to support these individuals to safely remain at their home while receiving treatment.

Methods: Methods: A retrospective chart review was conducted, in which initial referral forms submitted by the referral source were identified as either being a risk of harm to others or not. When referrals are made to Ontario Shores, an area on the form asks the referring source to indicate whether or not someone is considered a “risk of harm to others”. Other key words, such as “physically aggressive”, “violent” or “threat to others” contributed to determining whether or not an individual referred for service was identified as posing a risk of harm to those around them (staff and / or other residents). Service pathways and diagnoses types for those individuals referred in 2017 and 2018 to the GNOS program were also traced.

Results: In progress. From our last investigation, we found that in 2016 there were 522 referrals to the GNOS program at Ontario Shores. There were 77 admissions to GDU and GPU. Of these 77, thirty-six had contact with the GNOS program. In 2017, there were 488 referrals to the GNOS program. We are currently examining the numbers for 2018 and are in the process of comparing the data.

Conclusion: We expect that our evolving understanding of the complex individuals being referred to our service, and their specific needs will significantly contribute to advocacy efforts to further more specialized services and training for staff at Ontario’s long term care homes, and help reduce prevalence of harm. Additionally, it is hoped that we will be able to use this data to help inform generation of program goals at Ontario Shores. Lastly, we hope to continue repeating this data search regularly to compare / contrast the information.

Histopathological staging of salient cerebrovascular lesions associated with normal aging

Caroline Dallaire-Théroux¹, Stéphan Saikali², Simon Duchesne¹

¹ CERVO Brain Research Center and Faculty of Medicine, Université Laval

² Hôpital de l’Enfant-Jésus, CHU de Québec, Université Laval

Background/Objectives: Vascular cognitive impairment can be viewed as the clinical manifestation of diffuse underlying cerebrovascular disease. The latter can be confirmed with post-mortem examination. However, it is nonspecific and also found in cognitively intact individuals, as prevalence increases with age. There is also an important overlap between cerebrovascular pathology and other neurodegenerative conditions, especially Alzheimer’s disease, where more than 40% of cases are of mixed aetiologies. We aimed to validate a cerebrovascular pathology histological scale in order to assess the natural progression of vascular lesions associated with normal brain aging, and further understand their potential contribution to cognitive impairment.

Methods: Our sample was selected through the histological archives of the neuropathology department of the CHU de Québec (Hôpital de l’Enfant-Jésus). Brain specimens from 63 cognitively intact adult participants aged 19 to 84 were examined and rated by two blinded and independent observers (C.D.T. and S.S.) using an extensive assessment scale, namely a modified version of the Vascular Cognitive Impairment Neuropathology Guidelines (VCING; Skrobot et al. 2016). The scale focuses on nine anatomical regions and ten histological changes, including vascular wall lesions and secondary tissue damages. Weighted Kappa coefficients were calculated to estimate interrater reliability, and Spearman’s rank correlation test was used to calculate regional gradients of vascular load associated with age.

Results: First, preliminary analyses suggest an inter-observer agreement ranging from 0.39 to 1.00 for most regional scores of atherosclerosis, arteriolosclerosis, perivascular retraction and perivascular haemosiderin leakage. Secondly, atherosclerosis scores for the circle of Willis, arteriolosclerosis, and global perivascular hemosiderin deposits were significantly correlated with age (correlation coefficients of 0.76, 0.74, and 0.39, respectively; $p < 0.005$). There was also a trend in the severity of perivascular retraction associated with age ($\rho = 0.261$, $p = 0.039$). In arteriolosclerosis, the strongest regional gradients were observed in deeper brain structures (i.e., lenticular nucleus, striatum and thalamus). No fibrinoid necrosis or microaneurysm were found in these normal subjects. A few isolated microinfarcts and microhemorrhages, mainly in the lenticular nucleus and the striatum, were observed in a minority of cases ($n = 9$). No macroscopic infarct or lacune were detected, nor was macroscopic haemorrhage.

Conclusion: These preliminary results suggest an existing cerebrovascular pathology that accumulates with aging in

cognitively intact individuals, and the burden of which can be reproducibly estimated with a modified version of the VCING scale. This age-associated vascular load seems to manifest mainly as atherosclerosis of large vessels and subcortical arteriolosclerosis.

An Evaluation of the Alzheimer Society of Canada Resource Guide to Support Research Recruitment

*Saskia Sivananthan
Alzheimer Society of Canada*

Background/Objectives: In 2016, the Alzheimer Society of Canada (ASC), along with its partners across the country, led the development of a Resource Guide for ethical recruitment of research volunteers within the client population. In late 2017, a qualitative, retrospective outcome evaluation was undertaken of the Resource Guide. The Resource Guide was produced to serve as a catalyst for discussion and self-directed action toward organizational change and cultivation of a positive research culture through the provision of evidence-informed and practical solutions to help organizations achieve this goal.

Methods: A qualitative, retrospective outcome evaluation was undertaken to answer the following questions: 1. What practice changes were put in place to support research recruitment, following review of the Guide? 2. What features of the Guide, and / or supports provided during the review and feedback process contributed to practice changes to support research recruitment? 3. If other factors influenced practice changes to support research recruitment? An evaluation framework that aligned with these questions, with anticipated outcomes across the level of clients, the staff, and researcher involved in the development of the Resource Guide was used to organize data collection and analysis. Semi-structured telephone interviews were conducted. Content analysis was carried out on the open-ended data and using a directed approach, analysis began with the anticipated outcomes outlined in the evaluation framework. Frequencies and per cents were calculated for quantitative data.

Results: Overall, the findings demonstrate a strong positive trend with implementing practice changes to support research recruitment as a result of participating in the Guide developmental process. Many of the partners put in place new or updated practices that aligned with the anticipated outcomes of the Guide.

Conclusion: The Guide is a valuable tool for ASC and its partners to begin building capacity to support research engagement. Notably, these findings align with key findings from prior consultation activities including feedback from people living with dementia and their care partners that placing a greater emphasis on sharing research funding and recruitment opportunities with the public is essential.

APOE-ε4, white matter hyperintensities, and cognition in Alzheimer's and Lewy body dementia.

Saira Mirza¹, Usman Saeed¹, Jo Knight², Joel Ramirez¹, Donald Stuss¹, Di Yu¹, Walter Swardfager¹, Julia Keith¹, Sean Nestor³, Sandra Black¹, Mario Masellis¹

¹ Sunnybrook Health Sciences Center

² Lancaster University

³ University of Toronto

Background/Objectives: To determine if APOE-ε4 influences the association between white matter hyperintensities (WMH) and cognitive impairment in Alzheimer's disease (AD) and dementia with Lewy bodies (DLB).

Methods: 289 dementia patients (AD=239; DLB=50) underwent standardized volumetric MRI, neuropsychological testing, and APOE-ε4 genotyping. Total WMH volumes were quantified. Neuropsychological test scores were included in a confirmatory factor analysis (CFA) to identify latent constructs (cognitive domains) encompassing attention/executive functions, learning/ memory, and language, and factor scores for each domain were calculated per participant. After testing interactions between WMH and APOE-ε4 in the full sample, we tested cross-sectional associations of WMH with CFA-derived factor scores using multiple linear regression models in APOE-ε4 carriers (n=167) and non-carriers (n=122), and by APOE-ε4 allele dosage. We hypothesized that greater WMH volume would relate to worse cognition more strongly in APOE-ε4 carriers. Findings were replicated in 198 AD patients from the Alzheimer's Disease Neuroimaging Initiative (ADNI-I), and estimates from both samples were meta-analyzed.

Results: A significant interaction was observed between WMH and APOE-ε4 for language, but not for memory or executive functions. Separate analyses in APOE-ε4 carriers and non-carriers showed that greater WMH volume per standard deviation (SD) was associated with worse attention/executive functions (β -0.18, 95%CI:-0.35,-0.01), learning/memory, (β -1.07, 95%CI:-2.07,-0.08) and language (β -0.86, 95%CI:-1.51,-0.21) in APOE-ε4 carriers only. In the ADNI-I sample, greater WMH burden was associated with worse attention/executive functions (β -0.19, 95%CI:-0.28,-0.10) and language (β -0.65, 95% CI: -1.26,-0.03) in APOE-ε4 carriers only. In both study samples, no significant associations were observed in non-carriers. Meta-analyses showed that greater WMH volume was associated with worse performance on all cognitive domains in APOE-ε4 carriers only.

Conclusion: APOE-ε4 may influence the association between WMH and cognitive performance in patients with AD and DLB, and is consistent in both patient groups.

The N400 effect as a measure of semantic processing in healthy and pathological aging

Marilyne Joyal¹, Sonja A. Kotz², Christophe Lenglos¹, Emmanuelle Renauld¹, Maximiliano A. Wilson¹, Shirley Fecteau¹

¹ Université Laval

² Maastricht University

Background/Objectives: The N400 is an event-related potential (ERP) associated with meaning processing or semantics. The N400 effect is an index of semantic processing as measured by the amplitude difference between two semantic conditions (e.g. related and unrelated words). The N400 effect appears to be reduced in healthy elderly participants and participants with Alzheimer's disease (AD). On behavioral measures, the influence of imageability (a semantic variable) has been reported to be reduced in healthy elderly participants and increased in participants with AD. However, it has not been tested whether the degree of imageability affects the N400 effect in healthy and pathological aging.

Methods: In the first experiment, ERPs were recorded from 64 scalp positions in thirty-four elderly participants (mean age=72.1 y.o.; sd=4.3) and thirty-four young participants (mean age=25.4 y.o.; sd=5.1) while they performed a semantic judgment task. Participants were invited to determine if two words presented sequentially were related or not (e.g. truth - honesty). Imageability (high and low) and relatedness (related and unrelated) were orthogonally manipulated. Experimental conditions were matched by word frequency, length in letters, orthographic neighborhood size and association strength. We calculated performance accuracy, reaction times (in ms) on accurate responses, and the N400 effect using a time-window of 300 to 600ms post-stimulus onset on four regions of interest (ROIs) encompassing left/right anterior and left/right posterior ROIs. In the second and ongoing experiment, until now, we recruited eleven participants with mild to moderate AD (mean age=70.3 y.o.; sd=6.6) and followed the same methods as in experiment one.

Results: In the first experiment, the amplitude of the N400 effect is greater in the high-imageable condition than the low-imageable condition for young participants, but not for healthy elderly participants. We observed no significant difference between age groups in terms of accuracy, but healthy elderly participants showed longer reaction times as compared to young participants. Both age groups were more accurate and showed shorter reaction times in the high-imageable condition as compared to the low-imageable condition. In the second experiment, we expect to find a negative correlation between the amplitude of the N400 effect and cognitive performance of participants with AD on the Mini-Mental State Examination (MMSE). We also expect to find a positive correlation between the imageability effect (i.e. the difference between

the high and low imageable conditions, calculated separately for each outcome) and cognitive performance on the MMSE.

Conclusion: Results of the first experiment suggest that the electrophysiological response associated with semantic processing varies with imageability in young participants, but not healthy elderly participants. Young participants could recruit N400 generators more extensively to process words that evoked concepts with richer visual traits. Results are in line with previous findings which suggested that elderly participants rely less on imagery during semantic processing. If we confirm our hypotheses in the second experiment, it could suggest that AD participants show a gradual decline of semantic processing, which could be greater for words with less rich semantic information, such as low imageable words.

Virtual Reality therapy for inpatients with dementia: Learnings from a pilot study introducing a non-pharmacological intervention to an acute-care hospital

Lora Appel¹, Erika Kisonas², Eva Appel², Deanna Bartlett³, Jennifer Klein³, Jarred Rosenberg⁴, Christopher Smith⁴

¹ York University; University Health Network

² University Health Network

³ York University

⁴ Michael Garron Hospital

Background/Objectives: Behavioural and Psychological Symptoms of Dementia (BPSD) are difficult to manage, particularly in acute-care settings. As Virtual Reality (VR) technology becomes increasingly accessible and affordable, there is growing interest among clinicians to evaluate VR-therapy for managing BPSD in hospitalized patients, as an alternative to administering anti-psychotics and sedatives and/or using physical restraints associated with negative side-effects. Objectives: Validate the proposed research protocol and further inform the design of a randomized controlled trial (RCT) that evaluates the impact of VR-therapy on managing BPSD in acute-care hospitals. Special attention was given to ascertain the processes of introducing non-pharmacological interventions in acute-care hospitals.

Methods: Ten patients 65 years or older (mean = 87) previously diagnosed with Dementia, admitted to an acute-care hospital in Toronto, were recruited chronologically over three-month period into a prospective longitudinal pilot-study. The intervention consisted of viewing 5 to 20 minutes of immersive VR (360° footage of nature scenes) using Samsung Gear-VR head-mounted-display (HMD). A research coordinator facilitated the VR study session, helping the participant put on and remove the HMD and headphones. All participants viewed the same VR film consisting of five consecutive nature scenes: rocky lakeshore, sunny forest, dense forest, floating icebergs, and a sunny beach. Baseline and outcomes data were collected from the hospital electronic medical records, and

administering pre and post mood questionnaires, Neuropsychiatric Inventory (NPI) and through standardized qualitative observations during the intervention. Comprehensive process data and workflow were documented, including time stamps for each study task and detailed notes on personnel requirements and challenges encountered.

Results: On average 9.81 patients were screened daily, Monday through Friday. Of the 516 patients admitted during the study period, 67 screened positive. In total 234 calls were initiated to SDM(s) for the consenting process, resulting in 57 patients not being enrolled; nearly half (45.61%) due to SDMs declining participation. Ten consented participants enrolled and completed the study. The initial study session (questionnaires and VR-exposure) took on average 53.60 minutes. This was largely due to the administration of NPI (on average 19.5 minutes). During semi-structured interviews relating to their VR experience, four participants consistently responded reliably, one was able to respond initially but half-way through their stay was unable due to delirium. Five participants had difficulty answering questions about their mood before and after VR-therapy. Participants who were able to provide feedback (50%) regarding the VR content reported they would enjoy viewing more varied scenery (animals, fields of flowers, Christmas themes).

Conclusion: The pilot study was instrumental in identifying issues and areas of the protocol that needed changes in order to achieve a feasible RCT. We recommended modifications to the consenting process, since we found that requiring in-person signing by an SDM caused significant delays, and enrollment was strongly negatively impacted by SDMs perceptions and misconceptions about VR technology. Workflow and timelines needed adjustments to fit within other clinical activities (e.g. timing of first study visit vis-a-vis admission). Overall, patients with dementia appear to tolerate immersive VR, and with suggested protocol alterations, it is feasible to evaluate non-pharmacological interventions in acute-care hospitals.

Exploring technological characteristics of Virtual Reality interventions for individuals living with Dementia: a scoping review

Lora Appel¹, Suad Ali², Tanya Narang², Micaela Wiseman³, Natalie Ein⁴, Ani Orchanian-Cheff⁵, Jennifer Campos⁶

¹ York University; University Health Network

² York University

³ McGill University

⁴ Ryerson University

⁵ University Health Network

⁶ Toronto Rehabilitation Institute; University of Toronto

Background/Objectives: As Virtual Reality (VR) becomes increasingly accessible and affordable, there is growing promise that the technology will have applications for people

living with dementia (PWD). The types of VR equipment and content vary widely, and careful consideration must be given to develop and customize virtual environments that are optimized for the intended user. Environments should strike a balance that avoids being under/over-stimulating and should align with personal abilities, priorities and interests. The objectives of this scoping review are to describe the nature of VR technologies used in interventions implemented with for PWD; reflecting specifically on hardware and software characteristics.

Methods: A comprehensive search strategy was developed to identify studies involving VR technology with PWD or mild cognitive impairment. The initial search strategy was developed for Ovid Medline by using a combination of database-specific subject headings, text words, and key words generated through input from subject specialists. Databases were searched from inception through Jan 18, 2019; This search generated a total of 5733 articles. A final sample of 115 articles were included after initial title/ abstract and full text review was conducted, for which data will be summarized and reviewed in this article. Methods and numbers are summarized in the Prisma flow chart. Articles were coded by two independent reviewers on the following themes: devices used in the intervention, the sensory modality exposed to participants, mode of interaction, the frequency and length of exposure to the intervention.

Results: The most common device used was computer monitors (52). Modern technologies like tablets (14), smartphones (2), projection systems (23), and gaming systems (e.g. Nintendo Wii) (18) were also evaluated. Notably, Head mounted displays (HMD), required for immersive VR, were used in 14 studies. Ninety-four studies collected data through participants' motor responses (i.e. touching points on a screen); 67 collected informational data, (e.g. responses to a survey, by selecting or verbally stating yes/ no, left/ right, up/down); 33 gathered vocalizations (e.g. expressive reactions or utterances); 23 gathered physiological measures (heart-rate, respiration rate, gaze-direction, EEG, EMG) of which eight provided bio-feedback. Specific reference to time was made in 69 studies (60%). Intervention exposure length ranged from ten seconds to providing no time-limit; the most common exposure length was 16-30 minutes. Exposure frequency ranged from multiple daily to less than once/week, the most common frequency (used in 13 studies) exposed participants 3 times/week.

Conclusion: The VR systems in these studies were designed to evaluate outcomes on PWD, but many interventions use off-the-shelf devices which may not have the best usability practices for our intended population. Although commercially available, few interventions incorporated HMDs which afford the unique quality of presence. Frequency and intensity of exposure are of prime interest and importance in designing therapeutic interventions, yet no standard practice has been established for VR. Future research should examine modern

immersive devices, attempt to establish an ideal exposure length and frequency, and report on dementia-specific considerations in the use of, and interaction with, the VR device.

Exploring evaluation methods of Virtual Reality interventions for individuals living with Dementia: a scoping review

Lora Appel¹, Tanya Narang², Suad Ali², Natalie Ein³, Micaela Wiseman⁴, Ani Orchanian-Cheff⁵, Jennifer Campos⁶

¹ York University; University Health Network

² York University

³ Ryerson University

⁴ McGill University

⁵ University Health Network

⁶ Toronto Rehabilitation Institute; University of Toronto

Background/Objectives: As Virtual Reality (VR) becomes increasingly accessible, there is growing promise that the technology will have applications for people living with dementia (PWD). Given the range of VR technologies used in clinical interventions, their application and evaluation within specific populations should be considered critically to translate reliable and valid findings. In order to understand what has already been studied, we conducted a scoping review summarizing the current research landscape. The objectives are to describe the evaluation methods used in assessing VR technologies for interventions implemented with for PWD; reflecting specifically on population selection/sampling, data collection methods and study design.

Methods: A comprehensive search strategy was developed using a combination of database-specific subject headings and text words using Ovid Medline, and through the input from subject specialists. A revised search strategy was customized for each database which generated 5733 articles from multiple databases (e.g. MEDLINE, EMBASE, PsycINFO, CDSR, ALOIS, CINAHL, PubMed). The first 100 articles on Google Scholar search were also screened to ensure relevant articles were not overlooked. Excluding duplicates, 3420 articles were identified for initial screening by two independent coders using established inclusion and exclusion criteria. Additionally, 157 articles were identified through the reference lists of included articles. A final sample of 115 articles were coded and included for full-text review. The following themes were coded: (1) Population: sample size, demographics, inclusion/exclusion criteria, type of condition, disease status, and criteria for screening/ diagnosis. (2) Study: location, setting, sampling method, study design, data collection methods, and assignment methods.

Results: The majority of the papers used screening tools to determine participant inclusion: Mini-Mental-State-Examination was used in half the articles, Alzheimer's-

Disease-and-Related-Disorders-Association in 23%, and Montreal-Cognitive-Assessment in 10%. These tools vary in their sensitivity and specificity; if used as diagnosis rather than screening tool, they may misrepresent the intended population. Forty percent of the studies did not explicitly report the disease status of participants; 37% looked at patients with mild dementia, only 6% included participants with severe dementia. 69% of the articles reported inclusion/exclusion criteria for participants, 73% of which excluded participants due to co-morbidities. The review found 50% of the articles featured a cross-sectional design, 13% were randomized controlled trials and 8% were cohort studies. Furthermore, 35% of the study designs did not have a control condition and 37% of the articles featured a small sample size (<10 participants/condition). 49% of the included studies did not specify research settings.

Conclusion: These studies were designed to evaluate the outcomes of VR systems on PWD, however, the small size of study populations and focus on mild dementia, question the applicability on our intended population. The lack of clarity on a formal diagnosis (screening versus diagnosis tools) of study populations also has implications for validity. Given the degenerative nature of dementia, the low number of longitudinal designs can contribute towards inconclusive results. Future studies should incorporate rigorous sampling that include patients diagnosed with dementia and of varying severity, and should consider the impact on representativeness of the population by excluding individuals with co-morbidities.

Preparing for Phase II of the Canadian Consortium on Neurodegeneration in Aging (CCNA)

Howard Chertkow¹, Jane Rylett², Michael Borrie³, Sandra Black⁴, Howard Feldman⁵, David B. Hogan⁶, Mario Masellis⁷, Katherine McGilton⁸, Kenneth Rockwood⁹, Natalie Phillips¹⁰, Roger Dixon, et al.¹¹

¹ Dept. of Medicine (Neurology), University of Toronto, and Baycrest Health Sciences

² Department of Physiology and Pharmacology, Western University, and Robarts Research Institute, London, Ontario, Canada

³ Department of Geriatric Medicine, Western University and Lawson Health Research Institute, London, Ontario, Canada,

⁴ Division of Neurology, Department of Medicine, Sunnybrook Health Sciences Centre, University of Toronto, and Hurvitz Brain Sciences Program, Sunnybrook Research Institute, Toronto, Ontario, Canada

⁵ Department of Neurosciences, University of California, San Diego, California, USA,

⁶ Department of Medicine, University of Calgary, and The Hotchkiss Brain Institute, Calgary, Alberta, Canada,

⁷ Division of Neurology, Department of Medicine, Sunnybrook Health Sciences Centre, University of Toronto, and Hurvitz Brain Sciences Program, Sunnybrook Research Institute, Toronto, Ontario, Canada

⁸ *Lawrence S. Bloomberg Faculty of Nursing, University of Toronto, and Toronto Rehabilitation Institute, Toronto, Ontario, Canada,*

⁹ *Department of Medicine, Dalhousie University, Halifax, Nova Scotia, Canada*

¹⁰ *Department of Psychology, Concordia University, Montreal, Quebec, Canada*

¹¹ *Department of Psychology, and Neuroscience and Mental Health Institute, University of Alberta, Edmonton, Alberta, Canada,*

Background/Objectives: The Canadian Consortium on Neurodegeneration in Aging (CCNA) has been in existence since 2014. The major planned activities for its second phase are described here.

Methods: CCNA's phase 2 structure, goals, administration, teams, cross-cutting programs, and platforms are outlined.

Results: CCNA is continuing most of its activities from the first phase as well as adding some new ones, such as the CAN-THUMBS-UP prevention platform and a program emphasizing the perspectives of those with lived experience.

Conclusion: The plan of CCNA Phase II represents the basic Canadian approach to operationalize our major goals over the coming years.

Living Well with Dementia: Examining the Effectiveness of Social Recreational Programs to Promote Social Inclusion of Persons with Dementia

*Winnie Sun
Ontario Tech University*

Background/Objectives: Persons with dementia (PWD) and individual caring for a family member with dementia are at notably high risk of experiencing social isolation. Given that social isolation acts as a key contributor to a vast array of negative health risks such as increased risk of physical and mental health concerns, it is important to promote social connectedness of the dementia community to combat the associated health risks. To address the negative impacts associated with social isolation, social recreational programs led by community volunteers are developed to provide support systems that can relieve the challenges faced by members of the dementia community.

Methods: This evaluation study was designed to examine the factors that enabled the reduction of social isolation among PWD and their caregivers, to understand where volunteers have the greatest impact on program success, and to explore facilitators and barriers to improve the volunteer-based social recreational programs to promote social connectedness. An exploratory qualitative descriptive research design was used

to explore the study participants' lived experience within the "Living Well with Dementia" project. Participants were recruited from three sub-groups: persons with dementia, informal caregivers, and community volunteer. The study participants were recruited through purposive sampling from three types of social recreational programs at the Alzheimer's Society, including Minds in Motion, Brain Wave Café, and Caregiver Support groups. Qualitative data was collected through face-to-face qualitative semi-structured interviews using an interview guide. Thematic analysis was used to analyze the qualitative descriptive data. There was a total of 31 study participants in the final sample.

Results: The qualitative interviews highlighted the impact of social recreational programs on person with dementia, caregivers and volunteers in the promotion of social connectedness, as well as the examination of barriers and facilitators to identify opportunities for the future improvement of ASDR programs that would benefit the dementia community. These recommendations included: • Program exercises must be modified to accommodate the varying levels of cognitive and functional capacity of persons with dementia. • Developing a Volunteer Driver Program to provide companionship and transportation support to PWD. • Developing mentorship programs where mentors can provide new program members with coaching, guidance and support to facilitate the development of new social network. • Ongoing public education needed to raise awareness about dementia care and address the stigma associated with the disease to promote dementia-friendly community. • Developing comprehensive volunteer training programs with extended orientation and education to build competency and capacity in dementia care.

Conclusion: Our study findings revealed that the project "Living Well with Dementia" has been able to combat social isolation successfully through its volunteer-led social recreational and support programs for PWD and caregivers. Our study findings underscored the critical roles of volunteers who contributed to the success of these programs. Future research is needed to identify the opportunities to address the current gaps in services and to strengthen the social recreational programs using evidence-based practices and client-centered approaches. Continued efforts will be made to recruit, train and build a competent volunteer workforce with the capacity to support the development of dementia-friendly communities.

Dementia diagnosis and management by nurse practitioner led, interprofessional GAIN teams in Ontario

Stacey A. Hawkins¹, Carolee Awde², Kelly Kay², Deana Huntsbarger³, Erin Ferrier⁴, Nadia Sourial⁵, Genevieve Arsenault-Lapierre⁶, Carrie McAiney⁷, Isabelle Vedel⁵, K. Jennifer Ingram³

¹ *Seniors Care Network; Department of Recreation and Leisure Studies, University of Waterloo*

² *Seniors Care Network*

³ *Kawartha Centre*

⁴ *Undergraduate Medical Program, National University of Ireland Galway*

⁵ *Department of Family Medicine, McGill University; Lady Davis Institute, Jewish General Hospital*

⁶ *Department of Family Medicine, McGill University*

⁷ *Schlegel-UW Research Institute for Aging; School of Public Health and Health Systems, University of Waterloo; Murray Alzheimer Research and Education Program (MAREP)*

Background/Objectives: Learning objectives: 1. Better understand the population of persons living with dementia in community-based, Nurse Practitioner (NP) led, interprofessional Geriatric Assessment and Intervention Network (GAIN) teams. 2. Highlight the role of NP-led, interprofessional teams in dementia assessment and management in the community. Context: In Ontario, the Central East Local Health Integration Network (LHIN) responded to a growing need for dementia and frailty assessment services, which was being outpaced by the availability of primary care and geriatric medicine specialists. This response included the regional development, and eventual expansion of interprofessional Geriatric Assessment and Intervention Network (GAIN) teams to complement the primary care and specialist models, beginning in 2010. Since that time, GAIN Teams with Nurse Practitioners (NP) as most responsible provider (MRP) have been delivering interprofessional, comprehensive geriatric assessment (CGA) and interventions to the Region's ~96 000 frail older adults and their care partners. A significant component of this work has been diagnosing and managing dementia in the community-setting, alongside primary care.

Methods: Objectives: To describe dementia care management in interprofessional GAIN Teams in Ontario. Design: Retrospective chart review covering a 9-month study period (October 1st 2015 - July 1st 2016). Descriptive analyses were performed. Setting: 10 GAIN sites in the Central East Region of Ontario. Patients: 300 charts of randomly selected patients age 75 and older with dementia who had a visit during the study period. Outcomes: Proportion of new diagnoses made in GAIN, referred to a memory clinic, number of contacts with the GAIN Team, quality of dementia follow-up score based on 10 validated indicators (evaluation of cognition, functional status, behaviour, weight, caregiver status, driving ability, medication, use of anticholinergic drugs, referral to the Alzheimer Society, and referral to community services), completion of a comprehensive geriatric assessment (CGA), and evidence of a care plan.

Results: 86% of new diagnoses were made in GAIN, an average of 8 contacts were made with the patients during the study period, and no patients were referred to a cognition specialist. The overall quality of follow-up score was 8.4 out of 10. All but 1 patient (99%) had a full CGA begun or completed, and 69% had evidence of a care plan.

Conclusion: GAIN Teams in the Central East Region of Ontario are actively diagnosing and managing persons with dementia in the community. This includes a full CGA to assess concurrent issues associated with frailty, and the development and implementation of a care plan. This analysis confirms that NP-led, interprofessional teams offer a viable model that is able to meet the unmet need for diagnosis and management of dementia and concurrent frailty in the community.

Monitoring the transition of mild cognitive impairment to dementia using two computerized technologies: preliminary results for 2 cases

Andrew Frank¹, Iman Sabra², Bruce Wallace³, Michael Breau⁴, Lisa Sweet⁵, Rafiq Goubran⁶, Frank Knoefel⁷

¹ *Bruyere Research Institute, Bruyere Continuing Care, University of Ottawa*

² *Bruyere Research Institute*

³ *Bruyere Research Institute, Carleton University, AGE-WELL NIH SAM3*

⁴ *Bruyere Continuing Care*

⁵ *Bruyere Continuing Care, University of Ottawa*

⁶ *Bruyere Research Institute, Carleton University, AGE-WELL NIH SAM3*

⁷ *Bruyere Research Institute, Bruyere Continuing Care, University of Ottawa, Carleton University, AGE-WELL NIH SAM3*

Background/Objectives: Early detection of changes in cognitive function during aging is critical. Cognigram® and the investigational non-invasive medical device NeuroCatch™ Platform are two technologies that provide quick, portable, high-precision measurement, which are easy to use in older adults. Results are unaffected by language, educational level, or cultural background. Our study aims to assess the capacity of Cognigram and NeuroCatch to predict future cognitive decline in mild cognitive impairment (MCI) and cognitively normal (CN) older adults.

Methods: Cognigram is a computerized measure of cognition which consists of four individual tests measuring psychomotor function, attention, learning, and working memory. In this study, Cognigram testing sessions are performed at baseline, 3, 6, 9, 12, 24, and 36 months. NeuroCatch captures brain event-related potential (ERP) information following passive listening to tones and word pairs through an electroencephalogram (EEG) system. NeuroCatch testing sessions are performed at baseline, 6, 12, 24, and 36 months. Montreal Cognitive Assessment (MoCA) is performed every time the participant is seen. Clinical and neuropsychological evaluations are performed at baseline, 12, 24, and 36 months. 30 participants with Mild Cognitive Impairment and 30 healthy care partners were recruited from patients followed at the Bruyere Memory Program in Ottawa. Comparative preliminary baseline and 6 months data for one participant with MCI and

one CN participant are presented as a model of the analyses we will be performing.

Results: The cognitive performance of the participant with MCI (65 year-old male) at baseline was within borderline range across five of seven Cognigram measures (psychomotor function speed, attention speed, learning accuracy, composite psychomotor function/attention speed, and composite learning/working memory accuracy). His performance deteriorated on four measures (attention/working memory speed, working memory accuracy, and composite learning/working memory accuracy) over 6 months, at which six measures were within borderline range. NeuroCatch N400 ERP latency for the participant with MCI increased from 444ms at baseline to 538ms at 6 months. In contrast, the CN participant (76 year-old female) had only one measure within borderline at baseline (working memory accuracy), with six in the normal range. Surprisingly, after 6 months, two Cognigram measures (learning accuracy and working memory speed) declined, although all of the scores ended-up in the normal performance range. Finally, the CN participant N400 latency decreased from 568ms to 496ms at 6 months.

Conclusion: Preliminary findings from two individuals representing the study MCI and CN groupings suggest that Cognigram and NeuroCatch may be able to identify cognitive differences and subsequent cognitive change over a 6 month period. The participant with MCI performed worse on Cognigram testing at baseline and deteriorated over time, and ERP data supports an electrophysiological change in the same direction. Upon completion of the three-year data collection, it will be determined if Cognigram and NeuroCatch can identify which participants with MCI are more likely to convert to dementia.

How does game play change over 1 year in moderately advanced dementia?

Frank Knoefel¹, Rafik Goubran², Eleni Stroulia³, Laura Ault⁴, Iman Sabra⁴, Judith Kecskemet⁵, Bruce Wallace²

¹ Bruyere Research Institute, Bruyere Continuing Care, University of Ottawa, Carleton University, AGE-WELL NIH SAM3

² Bruyere Research Institute, Carleton University, AGE-WELL NIH SAM3

³ University of Alberta

⁴ Bruyere Research Institute

⁵ Queen's University

Background/Objectives: Most cognitive tests, such as Mini-Mental State Examination (MMSE) have a floor effect, with diminished efficacy in advancing dementia. Game play could be a pleasant alternative to formal cognitive testing in the monitoring of cognitive changes in moderately advanced dementia. The objective of our study was to measure how a

tablet-based “Whack-a-Mole” game play changes over 1 year in this patient group.

Methods: The recruitment plan was 30 participants with moderately advanced dementia from three dementia day programs across Ottawa, Ontario. Assessment of cognitive function was performed at baseline and at 1 year using: MMSE, Trail Making A (TMTA), and Rampart drawing. The “Whack-a-Mole” game used was a digitalized adaptation based on the traditional carnival game. The game was designed by researchers at the Universities of Toronto and Alberta and adapted by the authors. Players were instructed to hit moles and avoid bunnies as they appeared on a tablet screen. If 80% were correctly tapped, the duration of appearance decreased. Game play was recorded to monitor accuracy, reaction time, and level reached per game play session. Reaction time was considered a proxy for speed of processing and “not hitting bunnies” a proxy for inhibition. The impact of demographic variables will be considered.

Results: 25 participants were recruited, and 20 participants (12 male) played for the full duration of the study. The average age of the 20 final participants was 79.2 years old (ranged 69-89), and average education was 12.4 years (7-20). Average MMSE scores at the start and end of the study were 19.3 (11-25) and 18.7 (9-28) respectively. Average starting and ending TMTA times were 112 seconds (38-348) and 127 seconds (32-315). Of the 20 participants, 11 exhibited cognitive decline over the course of the study. Participants engaged in a total of 378 sessions, with 16.8 sessions averaged per participant who completed the study. These participants attained an average maximum difficulty level of 8.05 (3 -12) out of 15. All participants showed initial improvement in game play. Further analyses will determine subsequent trends in game play for various subgroups.

Conclusion: The study demonstrated that game play is possible with older adults with advancing dementia. Ongoing analysis of data will reveal whether game play exhibits trends relevant to cognitive change in this group. The analysis will show how game play evolved after initial improvement, comparing the declining vs. non-declining groups. This research was limited by the floor effect of the cognitive assessments and the number of participants. Future research directions include expanding the pool of participants, and investigating other games that can assess other cognitive domains.

Evaluating art therapy interventions that aim to reduce neuropsychiatric symptoms in moderate to advanced Alzheimer's disease using wearable sensor technology- A randomized crossover feasibility pilot protocol

Elena Guseva¹, Ovidiu Lungu², Isabelle Vedel¹, Sondra Goldman³, Mabelle Wilchesky⁴

¹ Department of Family Medicine, McGill University

² *Département de psychiatrie, Université de Montréal*

³ *Donald Berman Maimonides Geriatric Centre*

⁴ *Department of Family Medicine and Division of Geriatric Medicine, McGill University*

Background/Objectives: Non-pharmacologic interventions for neuropsychiatric symptoms (NPS) of dementia have been shown to be effective in institutional settings. Art therapy (AT) can provide effective therapeutic support for people with mild Alzheimer's disease (AD). AT, however, is a predominantly visual modality, and the range of available AT interventions decreases as AD progresses due to associated neuropathological changes in visual pathways. In order to be effective for persons with moderate-advanced AD, AT interventions require adaptation to account for AD-related visuo-perceptual deficits. Recent evidence suggests that psychophysiological signals obtained via wearable sensor technology can assist in intervention assessment by improving identification of behavioral patterns.

Methods: A randomized crossover feasibility pilot study in a large long-term care facility will be conducted to compare visually-enhanced AD-adapted AT (VEAT-AD) and non-adapted AT (NAAT) in: 1) Reducing agitation/aggression; 2) Reducing apathy; and 3) Increasing engagement. The following physiological measurements will be collected via wearable technology: (1) electrodermal activity, a known indicator for psychological states of agitation and aggression; (2) heart rate variability, and (3) heart rate per minute, both associated with disengagement, lack of interest and an absence of emotional responsivity typifying apathy; (4) activity levels (intensity and duration) throughout the day that also relate to apathy. In addition, agitation/aggression and apathy and social engagement will be assessed using the Neuropsychiatric Inventory-Nursing Home version and the Revised Index of Social Engagement, respectively. Psychosocial and behavioral responses during AT sessions will also be video recorded, coded and analyzed using the Engagement of a Person with Dementia Scale.

Results: We expect that our pilot data will suggest that: 1) Wearable sensor technology can provide rich and objective psychophysiological data in persons with moderate to advanced AD; 2) Cross-verification of psychophysiological and observational data will demonstrate feasibility of using wearable sensor technology in a future large clinical trial that will compare VEAT-AD with NAAT in reducing NPS in this population; and 3) VEAT-AD is more effective than NAAT at reducing symptoms of agitation/aggression and apathy and increasing levels of social engagement.

Conclusion: AD-related NPS are associated with poor quality of life, earlier institutionalization, accelerated disease progression, increased mortality and costs of care. AT can potentially provide effective therapeutic support for people with moderate and advanced AD through sensory stimulation, creativity, and social interaction, if it is appropriately adapted. This will

be the first dementia AT study to collect and analyze psychophysiological signal data. Through quantification of intervention effects with the use of objective outcome data, we aim to overcome one of the major limitations of current AT research.

NeuroBehavioural Program: Management of Neuropsychiatric Symptoms of Dementia in Long Term Care

Fozia Johri, Angelese Turner

Region of Peel

Background/Objectives: 62% of residents in Long-term care are diagnosed with some form of dementia, 46% will have behavioural and psychological symptoms of dementia (BPSD). This leads to increased hospitalizations, decreased quality of life, increased mortality and distress for caregivers. The Neurobehavioural program was developed to provide a clinical process of care delivery for behavioural management of Long Term Care (LTC) residents with BPSD. The team comprises of two Nurse Practitioners and a Geriatrician aimed at improving access to specialized services, strengthening nursing home capacity, employing best practices, and improving the quality of life of LTC residents with neuropsychiatric features of dementia.

Methods: The residents with BPSD symptoms are identified by the Ontario Behavioural Support workers. A thorough assessment is completed using the Neuropsychiatric Inventory-Nursing Home Version, cognitive assessment, and depression screening. The Behavioural support nurse then completes a referral to the NeuroBehavioural Nurse Practitioner (NBNP). The NBNP then completes a Complete Geriatric Assessment, and speaks to the family to gather further information. An initial consultation is booked with the Geriatrician and the family within the nursing home, and a consult is completed, with a mutually agreed care plan. The NBNP then continues to follow the resident throughout their dementia journey, and implements pharmacological management along with non pharmacological suggestions. There is continued family and staff support provided by the NBNP.

Results: The implementation of the program has shown a significant improvement in the frequency of agitation/aggression by 67%, irritability by 66%, hallucinations by 65%, delusions by 71%, and night-time behaviours by 81%. There have also been improvements in the severity of agitation/aggression by 67%, irritability by 68%, hallucinations by 70%, delusions by 57%, and night-time behaviours by 80%. The Neurobehavioural program made a significant impact on Behavioural unit admissions, with a decrease from 44% in 2017-2018 to 17% in 2018-2019, within 11 long term care homes in the Central West LHIN.

Conclusion: The implementation of the Neurobehavioral program provided increased on-site access to a specialized

team for behavioural management. This improved the quality of life of residents, reduced emergency department visits, reduced critical incidents, reduced behavioural unit admissions, reduced polypharmacy, improved LTC staff satisfaction, and improved LTC staff and physician understanding of behavioral neurology as it relates to dementia. The program continues to advocate for a more dementia friendly environment for the management of responsive behaviours. We are pleased that we achieved an Honourable Mention for the 2019 Central West LHIN Quality Award.

Connected speech in the logopenic variant of Primary Progressive Aphasia (PPA)

Monica Lavoie¹, Sandra Black², David Tang-Wai³, Carol Leonard⁴, Naida L. Graham¹, Elizabeth Rochon¹

¹ Department of Speech-Language Pathology, University of Toronto

² Sunnybrook Health Sciences Centre, Toronto

³ Department of Medicine, Division of Neurology, University Health Network Memory Clinic, Toronto

⁴ Audiology and Speech-Language Pathology Program, University of Ottawa

Background/Objectives: Despite specific diagnostic criteria (Gorno-Tempini et al., 2014), diagnosis for PPA can be challenging, especially for the logopenic variant (lvPPA) for which unreliable diagnosis has been documented (e.g. Mesulam et al., 2012). In-depth analysis of connected speech is often neglected in the diagnosis despite its importance, especially for lvPPA: only four studies have been conducted on this topic in this population (Boschi et al., 2017). Therefore, the aim of this study was to characterize lexical-semantic and morphosyntactic features of connected speech in lvPPA, in comparison to healthy controls, using three different elicitation contexts (i.e. picture description, story narration and interview).

Methods: A prospective group study was conducted to compare lvPPA participants (n=13) to age- and education-matched healthy controls (n=13). For each individual, connected speech was obtained using three tasks: 1) The Cookie Theft (BDAE; Goodglass et al., 2000); 2) Cinderella Story Berndt et al., 2000); 3) Topic-directed interview (Orange et al., 2000). The production on each task was recorded, transcribed and analysed according to the Quantitative Production Analysis protocol (QPA; Berndt et al., 2000). The Mann-Whitney U non-parametric test was used to compare the performance of the 2 groups on each variable of each task.

Results: The proportion of well-formed sentences was lower in lvPPA participants than controls for all elicitation contexts. The most frequent errors were missing determiners, missing or incomplete verb complements, errors in prepositions and errors in the verb form. Among the three elicitation contexts used, the topic-directed interview differentiated the lvPPA participants and controls the best.

Conclusion: Connected speech tasks should always be included in the assessment of lvPPA since they can highlight differences from healthy controls. Moreover, a semi-structured interview seems to be the most sensitive elicitation context and therefore should be included more often in clinical and research settings.

Centre versus Home-based Exercise (CHEX) Study: A Randomized Parallel-Group Trial of Exercise in Adults with Cognitive Impairment.

Laura Middleton¹, Sandra Black², Nathan Herrmann², Paul Oh³, Kayla Regan⁴, Lauren Bechard⁴, Krista Lanctôt²

¹ Department of Kinesiology, University of Waterloo

² Sunnybrook Research Institute, Toronto, ON, Canada

³ University Health Network, Toronto, ON, Canada

⁴ Department of Kinesiology, University of Waterloo, Waterloo, ON, Canada

Background/Objectives: Exercise improves physical and mental wellbeing of people living with mild cognitive impairment (MCI) or dementia. People living with MCI or dementia face significant barriers to exercise, yet we know little about effective strategies to promote exercise among people living with MCI or dementia in community settings. We conducted the Centre versus Home-based EXercise (CHEX) study, a 12-week pragmatic, randomized parallel group trial of centre-based (CB) versus home-based (HB) exercise among adults living with MCI or early dementia. Here, we present feasibility results.

Methods: Inactive, community-dwelling adults (≥ 50 years) diagnosed with MCI or early dementia ($\text{MoCA} \geq 17$ or $\text{MMSE} \geq 22$) were randomized at two sites (Toronto or Waterloo, Ontario). Participants had a care partner and were safe to exercise, but inclusion criteria were otherwise broad to reflect people seen in community and hospital memory clinics. Participants in the HB group received an individualized exercise prescription (including resistance, aerobic, and balance training), with the goal to progress towards physical activity recommendations (150min/wk of aerobic exercise, 2x/wk of strength training). Monthly telephone calls assessed progress and challenges, with exercise prescription was adjusted accordingly. Participants in the CB group also received individualized exercise prescriptions but attended a weekly, 60-minute, small-group exercise session in lieu of receiving monthly phone calls. Here, we report feasibility outcomes.

Results: Of 90 people screened eligible, 44 people living with MCI or early dementia (age 76.3[56-96] years; education 15.9[9-25] years; 12[28%] women) were recruited and randomized to the CB (n=25) or HB (n=19) groups. The majority of participants (n=34) were recruited at the Waterloo site. Most eligible participants who declined participation did so because of transportation or distance to the centre, which

was a greater barrier in Toronto (bigger city, longer distances, worse traffic). Of the 44 enrolled, 34 completed the study. Dropouts were predominantly from the HB group (n=9) and were more common in Toronto (n=5 [50%]) than Waterloo (n=5 [12%]). No adverse events were reported.

Conclusion: People with MCI or early dementia were more likely to complete the 12-week CB exercise program than a similar HB exercise program. However, the feasibility of CB versus HB likely depends on environment (distance, traffic) and social support (for transportation). The relative effectiveness warrants studying exercise interventions among people with MCI or dementia with a preference/needs-based design to support participant retention and translation of results to community settings.

From Barriers to Behavior Change: Exercise Providers may be Key to Enabling Exercise Among People Living with MCI/Dementia.

Laura Middleton ¹, Shannon Freeman ², Lauren Bechard ³, Jacqueline Pettersen ⁴, Jennifer Tomasone ⁵, Sherry Dupuis ⁶, Lora Giangregorio ³, Kayla Regan ³, Rebecca Ferris ²

¹ Department of Kinesiology, University of Waterloo

² University of British Columbia - Northern Medical Program, Prince George, BC, Canada

³ Department of Kinesiology, University of Waterloo, Waterloo, ON, Canada

⁴ University of Northern British Columbia, Prince George, BC, Canada

⁵ School of Kinesiology and Health, Queen's University, Kingston, ON, Canada

⁶ Department of Recreation and Leisure Studies, University of Waterloo, Waterloo, ON, Canada

Background/Objectives: Exercise improves physical and mental wellbeing among people with mild cognitive impairment (MCI) or dementia, yet many remain inactive. To effectively use exercise for clinical care and wellness promotion among people with MCI/dementia, we must identify and address barriers to participation. The Dementia-Inclusive Choices for Exercise (DICE) project is a national research partnership to promote exercise opportunities and participation among persons with MCI/dementia. Here, we present initial research from this project to: 1) understand barriers and facilitators for exercise among people with MCI/dementia; 2) map barriers onto potential behaviour change strategies using the Behaviour Change Wheel (BCW).

Methods: Semi-structured interviews and focus groups were conducted in Ontario and Northern British Columbia with several stakeholder groups involved in dementia care, including: community-dwelling people with MCI/dementia (n=14), care partners (n=12), exercise providers (n=35), and health care professionals (n=15). Audio recordings of interviews and

focus groups were transcribed and analyzed using qualitative thematic analysis. Themes were mapped to capability, opportunity, and motivation domains of the BCW by members of the DICE project (including both researchers and research partners from the dementia community), and then mapped to corresponding behaviour change strategies using the BCW.

Results: Major barriers and facilitators were identified in the following BCW domains: 1) Capability: cognitive deficits, physical health, fatigue; 2) Opportunity: access to programs meeting the physical and cognitive needs of people with MCI/dementia, poor understanding of dementia by exercise providers, stigma of dementia; 3) Motivation: apathy/low intrinsic motivation, encouraging exercise providers, care partner support, social engagement. The intervention identified as most appropriate was enablement of exercise through education and training of exercise providers, which would expand community exercise opportunities. Expanded community exercise opportunities would also have the added benefits of modelling by peers and incentivization due to social engagement.

Conclusion: We considered the perspectives of multiple stakeholder groups to identify appropriate behavior change approaches for exercise among people living with dementia. Our participatory research team converged on enablement as a key strategy to promote exercise among people living with MCI/dementia. Training exercise providers to understand, engage with, and meet the needs of people with MCI/dementia could be key to implementing exercise in the care and management of MCI/dementia by increasing the quantity and quality of exercise programs accessible to persons with MCI/dementia.

Physical Activity Experiences, Perceptions, and Preferences in Young-Onset Dementia.

Lauren Bechard ¹, Laura Middleton ²

¹ 200 University Avenue West

² Department of Kinesiology, University of Waterloo

Background/Objectives: Young-Onset Dementia (YOD) affects persons aged under 65 years old. Though YOD accounts for less than 10% of dementia cases, persons with YOD often have significant occupational and familial responsibilities at the time of diagnosis. Support to maintain engagement in life roles, social connectedness, and physical and mental health could have significant impacts for the individual with YOD and their family. Though there is limited research, physical activity is a reasonable strategy to improve physical and mental health among YOD and to socially engage. This study explores the physical activity behaviours, perceptions, and preferences of persons with YOD.

Methods: Persons with YOD were recruited through dementia advocacy groups and social media networks. Persons with

YOD completed semi-structured interviews about physical activity participation via web-conference or in-person. Interviews were audio-recorded and transcribed verbatim. Generalized thematic analysis identified themes about the experiences, perceptions, and preferences of persons with YOD for engaging in physical activity.

Results: Four persons with YOD (1 in Alberta; 3 in Ontario) have participated. Emergent themes from preliminary analysis are: (1) “Persons with YOD experience diverse benefits from physical activity”, reflecting the range of mental, physical, and social benefits persons with YOD associate with physical activity participation; (2) “Need for physically challenging but cognitively accommodating programming”, reflecting the unique physical activity programming needs of persons with YOD who are too physically fit to participate in typical dementia- or older adult-specific programs but require accommodations to make programs for healthy adults cognitively accessible; (3) “YOD-specific barriers: restricted income, age exclusion, and stigma”, highlighting the unique physical activity participation barriers experienced by persons with YOD in addition to the physical and cognitive symptoms of dementia. Analysis is currently ongoing and full results will be available in October 2019.

Conclusion: Physical activity could benefit the social and physical, and potentially mental, well-being of persons with YOD. This study is one of the first to explore how persons with YOD perceive physical activity and utilize it to maintain wellness and engagement in daily life. There is a need for increased accommodation of persons with YOD in general adult recreational programs as well as physical activity options designed for the YOD community. Future research should investigate strategies to create YOD-inclusive physical activity programming.

COACH program- caring for older adults in community and at home

*Tim Stultz, Kirsten Mallard, Elaine Campbell
Provincial Geriatric Program Health PEI*

Background/Objectives: With the increasing number of frail older adults living in the community, stewardship of health care spending must be optimized. Effective, direct client care at home, on a timely basis in an effort to predict and prevent (or proactively manage) health crises when they occur and ideally decrease urgent and acute system utilization is a potential solution to this challenge. COACH seeks to improve access to care for frail older adults by utilizing the full scope of a geriatric-focused Nurse Practitioner to link three care systems (primary, geriatric and home care) around the frail older adult.

Methods: COACH was piloted in one primary health clinic in PEI, developing a partnership between Home Care, Primary care and the geriatric program with the Nurse Practitioner

(NP) as the link between them. The NP was mentored/trained by the Geriatricians prior to starting the program. Participants were identified using the current Home Care list of frail senior clients (CIHI groupings) and ranking their use of the system (ER visits, hospital admissions and primary care visits). The highest users were admitted to the program and their outcomes followed in comparison with their previous year’s health system use. The NP administered a comprehensive geriatric assessment for every patient, developed a care plan in collaboration with the primary care provider and implemented the plan in cooperation with Home Care. Weekly rounds were held to follow the progression of the client. New indicators were developed as time went on.

Results: COACH was evaluated after the one year pilot and in an ongoing basis, assessing its impact on hospital admissions, ER visits and primary care visits. A qualitative assessment was done through surveys and interviews with clients, families and primary care providers. Later data was collected regarding nursing home length of stay (LOS) and number of home deaths. Utilization data demonstrated ER visits dropped by one third, primary care visits by half and hospital admissions by two thirds. Nursing home LOS dropped from 2.6 to 0.65 years (an estimated savings of \$1.4 million). Home deaths increased from approximately 5% to 33%. The qualitative evaluation revealed significant satisfaction across all groups and a demonstrable increase in knowledge of geriatric issues particularly in front-line caregivers. Smoother transitions to and from acute care and long term care were accomplished with an improvement in advanced care planning.

Conclusion: The COACH program achieved cost effective increased access to care for older adults with moderate to severe frailty and dementia including a large proportion with Behavioural and Psychological Symptoms of Dementia. This relied on a geriatric-focused Nurse Practitioner working to full scope and collaborating with Home Care, Primary Care and Geriatric services. Improved health outcomes were realized with significant health system savings. Patients, caregivers and health care workers all noted substantial satisfaction with the service and highly recommended it. The COACH program is an effective and practical tool to deliver care in the community to older adults with frailty.

Comparison of clinical features of Alzheimer’s disease patients with and without limbic TDP-43 pathology

*Atri Chatterjee, Ian Mackenzie, Veronica Hirsh-Reinshagen, Ging-Yuek Robin Hsiung, Blake Ducharme, Ali Mousavi
University of British Columbia*

Background/Objectives: TDP-43 is a key protein in regulation of cellular transcription and its pathological forms are associated with neurodegenerative disorders, particularly FTD

and ALS. Limbic TDP-43 pathology may occur as an isolated age-related finding and coexists in a significant proportion of Alzheimer's disease (AD) patients, particularly those over 80 years of age. It has recently been proposed that the limbic TDP-43 pathology is an important cause or contributor to dementia, referred to as "limbic predominant age-related TDP-43 encephalopathy." In this study, we investigated whether the coexistence of limbic TDP-43 pathology was associated with differences in the clinical expression of AD.

Methods: We reviewed the neuropathology database of University of British Columbia and selected patients with severe AD-type pathology and limbic TDP-43 pathology (N=8) and a comparison group with severe AD pathology only (N=16). Patients with other additional pathology (e.g., Lewy body) and those with known dementia-causing mutations were excluded. All patients had been longitudinally followed in the UBC Hospital Clinic for Alzheimer's disease and Related Disorders and had consented to research participation and autopsy. Clinical information, including age of onset, age at death, MMSE scores and cognitive domains affected were obtained from retrospective chart review.

Results: Patients with limbic TDP43 had an older age of onset (74 ± 10.1 years) and longer survival (8.9 ± 3 years) compared to those with AD pathology only (67.1 ± 9.3 , 7.1 ± 2.3 years, respectively); however, the difference was not statistically significant. Those with limbic TDP-43 pathology also had significantly lower mean MMSE score at initial presentation. The former group of patients were significantly older at the time of death.

Conclusion: Although patients with AD and coexistent limbic TDP-43 pathology tend to be older and have a lower MMSE score at presentation, they do not demonstrate any other significant differences in their clinical course of AD. These findings fail to support the existence of LATE as a clinical entity.

Machine learning versus traditional statistics: identifying neural correlates of agitation, aggression and impulse dyscontrol in preclinical and prodromal dementia

Sascha Gill¹, Pauline Mouches², Meng Wang¹, Deepthi Rajasheskar¹, Frank MacMaster¹, Nils Forkert¹, Eric Smith¹, Zahinoor Ismail¹

¹ University Of Calgary

² University of Calgary

Background/Objectives: Agitation and aggression are common in pre-dementia populations. However, the neural circuitry associated with these symptoms is not well understood. Mild Behavioural Impairment (MBI) categorizes symptoms of agitation and aggression into the MBI impulse dyscontrol domain (ID). We investigate if regional micro- and macro-structural brain properties are associated with ID using traditional statistical and machine learning (ML) approach.

Methods: Clinical, neuropsychiatric, and T1-weighted and diffusion-tensor MRI (DTI), data from 123 individuals with no symptoms of ID and 80 with ID symptoms were obtained from the Alzheimer's Disease Neuroimaging Initiative. Linear mixed effect (LME) models were used to assess if ID was related to regional DTI and volumetric parameters. ML modeling used a rule-based classification algorithm combined with an information gain feature selector to predict ID using neuroimaging variables.

Results: LME identified increased mean, axial and radial diffusivity in the cingulum, fornix, inferior/superior fronto-occipital fasciculus, and grey matter atrophy in parahippocampal gyrus and hippocampus. ML selected 9 features to predict presence of MBI ID. Cingulum and fornix were features consistent with those identified by conventional statistics. Additionally, ML identified the superior cerebellar peduncle, corpus callosum, supramarginal gyrus, and superior frontal regions.

Conclusion: Our findings provide evidence that the well-established atrophy patterns with AD-dementia are prominent in the presence of behavioural symptoms, even when disease status is controlled for, and in advance of cognitive decline. Both analytical approaches are effective, but ML is a more powerful technique capable of identifying structural changes in the brain associated with behavioural symptoms.

Performance during dual task gait assessments in cerebral amyloid angiopathy

Breni Varatharajah¹, Richard Camicioli², Myrlene Gee², Angela Zwiers¹, Ramnik Sekhon¹, Anna Charlton¹, Zahinoor Ismail¹, Eric Smith¹

¹ University of Calgary

² University of Alberta

Background/Objectives: Cerebral Amyloid Angiopathy (CAA) is a small vessel disease affecting blood vessels of the cortex and leptomeninges, characterized by deposition of amyloid beta protein. CAA can lead to subarachnoid hemorrhages, cortical superficial siderosis, leukoaraiosis, microbleeds, and intracerebral hemorrhages. Whether CAA causes gait impairment, as seen in Alzheimer's disease (AD) and non-CAA related leukoaraiosis, is currently not known. We hypothesized that gait speed during a mental task (i.e. a dual task) would be slower in CAA compared to normal controls (NC), and that more complex mental tasks would elicit relatively slower gait speed in patients with Alzheimer's disease compared to CAA.

Methods: Participants were selected from the Functional Assessment of Vascular Reactivity (FAVR) study (n=83), of which 14 had diagnoses of AD, 25 with CAA, and 44 were NC. The ProtoKinetics Walkway was used to capture footfalls over a

16-foot walk length, and gait velocity was calculated using ProtoKinetics Movement Analysis Software. In this study, we compared the three groups separately on two dual tasks: the Serial 1's task (where participants count backwards from 100 by ones while walking across the length of the walkway at their preferred pace) and the more complex Serial 7's task (where participants count backwards from 100 by sevens while walking across the length of the walkway at their preferred pace). Mean velocities were compared by independent samples t-test.

Results: On the Serial 1's task, the AD group displayed significantly slower average velocity as compared to NC ($p < 0.001$, Cohen's $d = 1.50$). The CAA group also displayed significantly slower average velocity on the Serial 1's task as compared to NC ($p < 0.001$, Cohen's $d = 1.37$). When comparing performances of the two disease groups, AD and CAA were not significantly different ($p = 0.85$, Cohen's $d = 0.07$). On the Serial 7's task, the AD group displayed significantly slower average velocity as compared to NC ($p < 0.001$, Cohen's $d = 1.21$). The CAA group also displayed significantly slower average velocity on the Serial 7's task as compared to NC ($p < 0.001$, Cohen's $d = 1.37$). When comparing performances of the two disease groups, AD and CAA were not significantly different ($p = 0.69$, Cohen's $d = 0.13$).

Conclusion: We confirmed our hypothesis that gait speed is impaired in CAA compared with NC. Future work will correlate the degree of gait impairment with potential causes (i.e. white matter hyperintensity volume and atrophy) as well as other markers of CAA severity (such as microbleed count). In contrast to our pre-specified hypothesis, CAA and AD performed equally poorly on both simple and more complex dual tasks, suggesting that there is a similar lack of brain reserve in both conditions.

Primary Health Care Management of Dementia in Ontario

Geneviève Arsenault-Lapierre¹, Jennifer Ingram², Nadia Sourial³, Carrie McAiney⁴, Linda Lee⁵, Deana Huntsbarger², Carolee Awde², Stacey Hawkins⁴, Kelly Kay⁶, Erin Ferrier², Isabelle Vedel³

¹ Lady Davis Institute, Jewish General Hospital, Montreal, Quebec

² Kawartha Centre, Peterborough, Ontario

³ Department of Family Medicine, McGill University, Montreal, Quebec

⁴ School of Public Health and Health Systems, University of Waterloo, Waterloo, Ontario

⁵ Department of Family Medicine, McMaster University, Hamilton, Ontario

⁶ Seniors Care Network, Ontario

Background/Objectives: Primary care is the way forward in dementia care as recommended by Canadian Consensus conferences. In Ontario, many local initiatives have developed

within primary care clinics (Family Health Teams-FHT and Family Health Organizations-FHO) since 1999. The objective is to describe dementia care management in FHTs and FHOs in Ontario.

Methods: Design: Retrospective chart review covering a 9-month study period (October 1st 2015 - July 1st 2016). Descriptive analyses were performed. Setting: 8 sites in Ontario, including 7 sites in the Central East Local Health Integration Network (LHIN) and 1 site in the South East LHIN. Patients: 241 charts of randomly selected patients age 75 and older with dementia who had a visit during the study period. Outcomes: Proportion of new diagnoses made in primary care, referred to a memory clinic or specialist in cognition, number of contacts with the primary healthcare team (FHT/FHO) and quality of dementia follow-up score based on 10 validated indicators (evaluation of cognition, functional status, behaviour, weight, caregiver status, driving ability, medication, use of anticholinergic drugs and referral to community services including Alzheimer's Society).

Results: 62% of new diagnoses were made in primary care, an average of 5 contacts were made with the patients during the 9-month study period, and 63% of the patients were referred to a specialist in cognition or memory clinic. The average number of follow-up items recorded in the charts was 3.5 out of 10.

Conclusion: Primary care teams in Ontario (FHTs/FHOs) are actively diagnosing and managing persons with dementia in the community. This includes referring patients to specialists or memory clinics for specific concerns. Primary care is identified as both capable and interested in the diagnosis and management of dementia. Opportunities for improvements in follow-up care and documentation were identified.

The influences of cerebral amyloid angiopathy on clinical features and presence of brain microhemorrhages in patients with Alzheimer dementia

SeyedAli Mousavi¹, Ian R. A. Mackenzie², Veronica Hirsh-Reinshagen², Blake Ducharme¹, Atri Chatterjee¹, Ging-Yuek R. Hsiung¹

¹ Division of Neurology, Dept. of Medicine University of British Columbia

² Department of Pathology and Laboratory Medicine, Faculty of Medicine, UBC

Background/Objectives: Cerebral amyloid angiopathy (CAA) is common in patients with age-related neurodegenerative dementia. However, the relationship between severity of CAA and the decline of cognitive function is unclear. In the present study, we examined the relationship between severity of CAA and the clinical and pathological features of patients with Alzheimer dementia.

Methods: We reviewed records of patients with dementia who underwent autopsy at the UBC Hospital Clinic for Alzheimer's disease between 1994 and 2017 and selected cases in which CAA is identified with AD and compared them to cases with AD without CAA. Demographics, relevant clinical and pathological characteristics, MMSE, and survival indexes were compared by chi-square test, ANOVA and Spearman's Correlation Co-efficient statistic where appropriate with SPSS 25.

Results: A total of 129 cases (68 females) were included. 23 cases had no CAA (17.8 %), 53 mild (41.1 %), 43 moderate (33.3%), and 10 severe (7.8%). Mean age of death was 75.11 ± 11.24 . There was a significant sex difference with higher frequency of CAA in males overall ($p = 0.027$), whereas more females were found in the mild CAA group ($p < 0.00625$). On review of cardiovascular risk factors, CAA was less frequent in diabetes mellitus patients ($p = 0.043$). There was also a significant association between CAA and dyslipidemia in which severe CAA was found in patients with dyslipidemia ($p = 0.021$). The only significant pathological finding was association between microscopic hemorrhage and presence of CAA ($p = 0.009$), with increasing frequency in more severe CAA ($p = 0.0014$). There was no significant difference between MMSE at initial presentation, duration of disease, and survival, with various degrees of CAA.

Conclusion: As expected, CAA is associated with the presence of microhemorrhages. Interestingly, CAA is less frequent in patients with DM, but more frequent in patients with dyslipidemia in our sample. No clear association was found between severity of CAA and cognitive impairment, disease duration, or long-term survival. Further studies with larger samples may be needed to detect more subtle influences of CAA pathology on clinical presentation.

Assessing Changes in Visual Attention Secondary to Mild Hearing Loss in Aging through the Study of Response Time and Event-Related Potentials

Susan M.E. Gillingham¹, Nicole D. Anderson², Claude Alain²

¹ Rotman Research Institute, Baycrest Health Sciences

² Rotman Research Institute, Baycrest Health Sciences

Background/Objectives: Studies were designed to evaluate the association between hearing loss (HL) in aging and extra-auditory attention by assessing younger normal-hearing adults (YN), and older adults with either age-typical hearing (ONHA) or mild hearing loss (OHL). These studies aimed to: (i) test whether there are changes in visual attentional processes as measured on a reaction time (RT) task that was associated with HL, and if so, where they occur within the range of basic to more advanced processing; and (ii) assess whether there is compensatory responding in the visual system in the context of HL as expected from previous literature.

Methods: Participants included: i) 21 YN, aged 20-30, ii) 17 ONHA, aged 66-77; and iii) 15 OHL, aged 65-79. Mild HL was defined by hearing thresholds between 20 and 40 dB HL from 250 to 3000 Hz. The participants did not demonstrate cognitive impairment on neuropsychological tests. The Feature Integration Task (FIT), administered with EEG, consists of four visual tasks presented in a set order that have hierarchically-varied attentional demands. Additionally, variable wait times in between the disappearance of one stimulus and the appearance of the next assessed automatic versus strategic response preparation. The first aim was met by assessing the effect of hearing loss on: i) RT and ii) strategic versus automatic response preparation. The second aim was met by comparing the OHL and ONHA groups on the latency and amplitude of the N1 at posterior electrode sites and the P3 at both posterior and anterior electrode sites.

Results: For the first aim, compared to both the YN and ONHA groups, the OHL group demonstrated slowing on the simplest tasks, and difficulties with automatic, more than strategic, response preparation as task demands changed. For the second aim, compared to the ONHA group, the OHL group had a longer N1 latency that correlated with their speeded visual executive neuropsychological test scores, longer anterior P3 latencies, hemispheric symmetry of N1 amplitudes indicative of less efficient top-down control, and anterior P3 amplitudes that indexed over-processing of unnecessary information. Latency and amplitude of the posterior P3 were comparable between both older groups.

Conclusion: Cognitively-intact older adults with mild HL demonstrated differences in performance that may have indexed declining or more effortful attentional processes in: i) RT on the simplest tasks and mostly automatic preparatory processes compared to the YN and ONHA groups; and ii) ERP indices of sensory-cognition integration and early attentional guiding compared to the ONHA group. These findings suggest that the association between sensory loss and cognitive decline extends beyond the auditory domain, with mechanisms involving either localized differences in subcortical regions of sensory-motor-cognitive integration and/or disruptions of functional networks.

Transitioning to Transitional Care: Optimizing Responsive Behaviour Management of ALC Patients with Dementia through the Transitional Care Unit Transfer Checklist

Georgi Georgievski, Leonardo Alfaro, Meridith McClenaghan, Daniela Soares, Maureen Matheson, Krisanne Stanoulis, Daniel Boyle, Linh Chau, Jordan Pelc
Bridgepoint Active Healthcare

Background/Objectives: Patients with dementia and other cognitive impairments continue to represent a significant proportion of ALC patients within Ontario hospitals. Despite

this, there are limited resources available to help manage the responsive behaviours of ALC patients with dementia in hospital settings. Consequently, the Transitional Care Unit (TCU) at Bridgepoint Active Healthcare (BAH), a rehabilitation and complex care hospital in Toronto, ON, struck a Working Group (WG) to develop a system of reporting to help manage the clinical needs of ALC patients prior to and following transition onto the TCU.

Methods: Citing resources developed by the Alzheimer's Society of Canada, the WG developed a TCU Transfer Checklist to help share information on the clinical and behavioural needs of ALC patients who were being referred for transfer onto the TCU. The TCU Transfer Checklist was vetted through multiple Unit-wide consultations that focused on the experiences of Allied Health and Nursing Staff and, from these, a new system of reporting and recording responsive behaviours was developed for the Unit. Measures of errors in transfer, patient behaviour escalation, and staff workload were used to monitor the success of the TCU Transfer Checklist.

Results: Over a 12-month period, the TCU Transfer Checklist was employed 60 times. In these, over 95% of errors in transfer ($n=2$, 3.33%) and incidents of patients' responsive behaviours escalating during transfer ($n=3$, 5%) were prevented. Staff workload related to transfers to the TCU also decreased by 10% (65% v. 55%) over the 12-month period. In that same period, the TCU Transfer Checklist was presented to the hospital senior administration, with whose support the Checklist became a standard requirement for submitting patient transfer referrals across all Units at BAH.

Conclusion: The TCU Transfer Checklist is a simple, effective intervention to better monitor, record, and manage the responsive behaviours of patients with dementia prior to, during, and after transitioning across a rehabilitation and complex care hospital improving overall quality of care and patients' and families' experiences. It is an important case study of bottom-up organization change in dementia care.

Supporting Sexual Expression in Patients with Dementia

*Leonardo Alfaro, Nadia Snash, Georgi Georgievski, Daniela Soares, Maureen Matheson, Krisanne Stanoulis, Meredith McClenaghan, Daniel Boyle, Linh Chau, Jordan Pelc
Bridgepoint Active Healthcare*

Background/Objectives: Eighty percent (80%) of elderly people, including those with dementia, remain sexually active throughout their lives. Despite this, there is a knowledge gap for clinicians in supporting sexual expression among the elderly with dementia. In order to provide appropriate support, clinicians need to appreciate issues of capacity and privacy specific to the dementia population. As such, an educational

intervention was developed to address this knowledge gap on the Transitional Care Unit at Bridgepoint Active Health, a mixed rehabilitation and complex care hospital in Toronto, Ontario.

Methods: Two focus groups with staff were conducted over 4 weeks to ascertain existing knowledge and experience of sexual expression in patients with dementia. The educational intervention was developed based on identified gaps from these focus groups. It involved a 1-hour training session that included a PowerPoint presentation, facilitated discussion, and case studies to facilitate reflection and learning.

Results: Pre- and post-intervention surveys ascertaining staff knowledge and attitudes revealed a 33% increase (86%, increased from 55%) in the number of staff who believed patients with dementia are not capable of making appropriate decisions regarding participation in sexual relationships, and a 26% increase (97%, increased from 71%) in the number of staff who supported the provision of privacy in hospitals and long term care homes for sexual expression among patients.

Conclusion: This unit-based quality improvement initiative demonstrates that a simple educational intervention can enhance knowledge and appreciation among clinicians needed for appropriate support of sexual expression in patients with dementia.

Working together - Using group-based therapeutic programming to increase patient satisfaction and quality of life on a Transitional Care Unit

*Maureen Matheson, Krisanne Stanoulis, Daniel Boyle, Meredith McClenaghan, Daniela Soares, Georgi Georgievski, Leonardo Alfaro, Linh Chau, Jordan Pelc
Bridgepoint Active Healthcare*

Background/Objectives: Cognitive Training Therapy and Reminiscence Therapy have demonstrated improved cognition, mood, and general behavioural function in patients with dementia. 1:1 patient-volunteer interaction programs such as MAUVE (Maximizing Aging Using Volunteer Engagement) have also gained popularity within the healthcare system, as a way to maximize patient stimulation, reduce caregiver strain, and improve nursing staff workload satisfaction. In this study, we set out to determine the effects of implementing group therapy interventions, and MAUVE volunteer programming on the quality of life patients admitted to an inpatient transitional care unit.

Methods: This study took place on the Transitional Care Unit (TCU) at Bridgepoint Hospital, a 64-bed unit of primarily elderly individuals awaiting transition from hospital to community. 70% of patients admitted to this unit have a diagnosis of dementia, with 90-95% ultimately discharged to long-term care. We introduced weekly cognitive groups, reminiscence groups, and MAUVE programming on the

TCU. We conducted our intervention 59 patients, 13 of whom were members of a Reminiscence Group, 16 of whom were members of a Cognitive Group, 30 of whom participated in MAUVE and 10 of whom participated in 2 or more programs. The primary outcome from the Cognitive and Reminiscence groups was improvement in patient-reported mood, measured by surveys administered weekly before and after the intervention. Patient social engagement, staff satisfaction, and volunteer fulfilment were secondary outcomes.

Results: Results from 75 surveys collected weekly before and after the Cognitive Group demonstrated that 92% of respondents reported improved mood following the intervention. Similarly, results from 69 surveys collected weekly before and after the Reminiscence Group demonstrated that 51% of respondents reported improved mood following the intervention. Data collected over 3 months for our MAUVE program demonstrated 685 additional patient engagement hours of support, which is an average of 57 hours/per week of additional patient interaction. Likewise, over the same period, the MAUVE program an additional 890 individual patient visits/interactions, which is an average of 74.2 additional direct patient visits/week. Qualitative comments from both patients and caregivers provided within each survey on a weekly basis support the benefits of all 3 programs.

Conclusion: Group therapeutic programming increased patient satisfaction across all 3 patient-centered therapeutic initiatives within the TCU at Bridgepoint Hospital. Cognitive Group Therapy and Reminiscence Group Therapy have led to an improvement in patient mood, quality of life, and desire to engage with other patients within the hospital. The MAUVE program has demonstrated an increase in additional patient engagement hours of support, patient social engagement, staff satisfaction, and volunteer fulfilment. These programs increase patient quality of life and number of hours of patient interaction without increasing cost the facility.

Group physiotherapy improves patient participation and satisfaction on an inpatient transitional care unit

*Daniela Soares, Leonardo Alfaro, Meridith McClenaghan, Maureen Matheson, Krisanne Stanoulis, Georgi Georgievski, Daniel Boyle, Linh Chau, Jordan Pelc
Bridgepoint Active Healthcare*

Background/Objectives: Exercise and physical activity have been shown to preserve physical and cognitive function and have positive effects on mood. Programs providing dementia care often have limited resources for providing physical therapy. Group activities are an established strategy for optimizing therapeutic resources in this population. We set out to determine whether group exercise classes on an inpatient transitional care unit would increase patient access and participation in physiotherapy, and patient satisfaction.

Methods: This study took place on the Transitional Care Unit (TCU) at Bridgepoint Hospital, a 64-bed unit of primarily elderly individuals awaiting transition from hospital to community. Prior to our intervention, physiotherapy services on the TCU were offered in individual, one-to-one patient sessions by a physiotherapist or physiotherapy assistant. Sessions generally lasted 15 minutes or less, and were offered only 2 to 3 times per week because of resource limitations. Group exercises classes were introduced in 2018 to improve access and participation, without changing the staffing resources on the unit. A chart review was conducted to collect data. The primary outcome measures were percentage of patients attending physiotherapy, and number of therapy minutes in a 30 day period. Patient satisfaction was tracked as a secondary measure with a post group exercise survey.

Results: Patient attendance increased from 66% in those offered one-to-one sessions, to 71% for those offered group therapy. The number of therapy minutes likewise increased, from 3517 therapy minutes in a 30-day period for 1:1 therapy, compared to 4650 therapy minutes in a 30 day period for those offered group exercise. Patient satisfaction was high. 81% of group therapy participants reported that they would return to the group, 17% reported they would “maybe” return and the remaining 2% indicated that they would not return to the group

Conclusion: The introduction of group exercises to the TCU has been successful in increasing patient participation and has resulted in an overall increase in therapy minutes received by patients. Patient satisfaction within group therapy appears to be high, with the majority of patients indicating their intention to continue to attend group therapy sessions. Group physiotherapy is an efficient way to increase patient care and satisfaction for inpatients with dementia without increasing staffing resources.

Evaluation & Sustainability of Behaviour Huddles: Simple Intervention for a Complex Issue

*Meridith McClenaghan, Georgi Georgievski, Leonardo Alfaro, Daniela Soares, Maureen Matheson, Krisanne Stanoulis, Daniel Boyle, Joanne Byrne, Linh Chau, Jordan Pelc
Bridgepoint Active Healthcare*

Background/Objectives: At a mixed rehabilitation and complex continuing care hospital in Toronto, ON, patients present with a diverse range of diagnoses and co-morbidities. In particular, patients with neurocognitive disorders and dementia-related impairments may present with challenging responsive behaviours that can significantly impact both patient care and staff safety. In a health care climate of fiscal constraints, managed resources, and increased patient complexity, inpatient interprofessional health care teams are confronted with the need to find innovative ways to provide optimal patient care,

maintain patient safety, and facilitate patient transitions. To address the complex responsive behaviours exhibited by several patients with dementia,

Methods: Longitudinal post-intervention evaluation used a mixed methods design consisting of interprofessional staff surveys and focus groups to capture team perspectives, and chart audits for frequency of documentation of behaviour episodes.

Results: A comprehensive range of strategies are explored and utilized including pharmacological and non-pharmacological approaches. Patient-specific factors are also emphasized. Positive outcomes included increased assessment and monitoring of behaviours and interventions, increase in documentation of behaviours, and facilitated LTC discharges due to behaviour improvements. Focus group data reflects both on patients and staff well-being, sharing positive and constructive feedback, encouraging peer learning, alleviating stress and fatigue, and preventing staff injuries.

Conclusion: Behaviour Huddles have enabled the Transitional Care Unit's interprofessional team to implement consistent responsive behaviour management and strategies contributing to patient care and safety. There has been increased staff awareness of and capability to address behaviours, and enhanced interprofessional team communication.

The relationship among vision-, hearing- and cognitive functions in older adults undergoing low vision rehabilitation: Preliminary data analyses at baseline

Gabrielle Aubin¹, Karine Elalouf¹, Andrea Urqueta Alfaro¹, Aaron Johnson², Julie-Andrée Marinier¹, Eva Kehayia³, Jean-Pierre Gagné¹, Caitlin Murphy², Kathy Pichora-Fuller⁴, Natalie Phillips², Walter Wittich¹

¹ Université de Montréal

² Université Concordia

³ Université McGill

⁴ University of Toronto

Background/Objectives: Age-related macular degeneration is the most common cause of vision impairment in people aged 55 years or older and has been associated with lower cognitive function and a higher risk of dementia. Vision rehabilitation using magnification devices (e.g. magnifier, CCTV) can reduce the amount of effort necessary for reading. Successful reading rehabilitation should reduce cognitive effort, potentially resulting in better cognitive functioning. The aim of this study was to investigate the impact of reading rehabilitation on cognition in older adults with acquired vision loss.

Methods: Seventeen older adults (age range 69-95 years, Mage = 83.64, SD = 7.84) with macular degeneration (acuity < 20/60 in better eye with best correction) newly referred to vision rehabilitation were tested in the vision, hearing, and

cognition domains. Reading acuity and speed were assessed using the MNRead and the International Reading Speed Texts (IReST). Hearing was assessed using the Canadian Digit Triplet Test (CDTT) and audiometry. Cognition was measured using the Montreal Cognitive Assessment (MoCA), the Rey Auditory Verbal Learning Test (RAVLT; Part 1 & 2), the Oral Trail Making Test (Part A & B), two word fluency tasks (phonemic/FAS and category/animals) and an N-back working memory task. Demographic information about the participants were obtained through the use of a questionnaire and the Depression, Anxiety and Stress Scale (DASS 21). Pearson correlation coefficients were calculated on baseline data.

Results: Lower reading acuity was associated with higher stress, $r = 0.654$, $p = 0.04$, and depression, $r = 0.710$, $p = 0.021$, scores on the DASS 21. Higher anxiety scores on the DASS, $r = -0.933$, $p = 0.007$, were related to lower reading speed on the IReST. Lower speech in noise reception thresholds as measured by the CDTT were correlated with lower MoCA scores on the full, $r = -0.515$, $p = 0.041$, and the blind MoCA, $r = -0.539$, $p = 0.031$, and the RAVLT delayed recall, $r = -0.678$, $p = 0.006$. Faster reading speeds on the IReST were associated with better full MoCA scores, $r = 0.871$, $p = 0.024$.

Conclusion: These preliminary data analyses at baseline give us an early global portrait of the relationships among vision-, hearing, and cognitive functions in visually impaired older adults before the rehabilitation process. Better hearing and reading abilities are correlated with a higher score on the MoCA, the MoCA blind and the RAVLT. Better reading acuity was associated with lower levels of stress, anxiety and depression. These results support previous reports of a possible link between visual, auditory and cognitive decline. Follow-up with these participants over the coming 12 months will answer the question as to whether cognitive abilities improve during vision rehabilitation.

Late stage dementia & hip fractures: a tale of two women

Ruth Ellen

Bruyère Continuing Care

Background/Objectives: Late-stage dementia is a life-limiting condition and in this population, hip fractures are common. For those living in long-term care, the annual incidence is 4% (Weller, 2004) with a 40% risk of death, and a 6-12% risk of subsequent fracture (Papaioannou, 2000). Most never return to pre-fracture function, and 2/3 cannot be independently mobile (Crotty, 2000; Rapp 2008). In those over 65 years, accidental injuries are the 5th leading cause of death, with falls comprising 2/3 of these deaths (Rubenstein, 2006). These case studies examine the impact of supported decision making for post-fracture care in the context of late-stage dementia.

Methods: Case studies

Results: We review the cases of two women with late-stage dementia and post-fall hip fractures. One woman undergoes surgical repair, and the other is managed conservatively with palliation for active dying. Evaluating the outcomes for these women and their loved ones highlight essential components of supported decision making.

Conclusion: These cases help clarify the features of informed decision making for substitute decision makers caring for those with late-stage dementia.

Behavioural Supports Ontario (BSO) and GAIN - a perfect match for collaborative community dementia care

Brandi Flowers¹, Karen Lee Boulton²

¹ *Geriatric Assessment and Intervention Network (GAIN)*

² *Behavioural Supports Ontario (BSO)*

Background/Objectives: The poster presentation will illustrate successful patient outcomes of the Central East Local Health Integration Network (LHIN) model to support persons living with dementia in the community. Embedding BSO clinicians in interprofessional Geriatric Assessment and Intervention Network (GAIN) teams provides the combined benefit of the Comprehensive Geriatric Assessment (CGA) and the expertise of behavioural support clinicians to provide coordinated care based on a standardized assessment approach. Outcomes to be highlighted: • Person and family centred approach • Enhanced family and care partner support • Maximization and/or maintenance of function and independence • Optimization of the individual's capacity for autonomous living • Improved transition support • Increased dementia care capacity

Methods: In 2011, the BSO project was created to enhance services for Ontarians with behaviours associated with complex mental health, dementia or other neurological conditions. A phased implementation approach began with the LTC sector by embedding dedicated BSO resources in pilot homes. From lessons learned, dedicated staff resources were spread to additional LTC homes and community GAIN teams. As evidence best supported integration into specialized geriatric care teams, GAIN provided a mature interprofessional infrastructure to host BSO clinicians

Results: GAIN is a network of twelve teams that include one BSO clinician within each team. The marriage of the CGA and the behavioural assessment ensures that all reversible physiological, environmental and psychosocial conditions are addressed facilitating a focused approach to behavioural care planning. Individualized "one of" care plans are created in collaboration with patients and care partners to optimize function and independence and keep older people living at home who might otherwise occupy hospital or LTC beds. Based on the responsive behaviour frequency, risk, severity

and care partner impact the BSO Clinician will assume one of three roles within the team as detailed below. 1. Advisory: Offers expert behavioural management strategies to interprofessional peers who will continue to support the patient. 2. Consultative: Assess the patient to provide recommendations to the interprofessional team as they continue to follow the patient. 3. Lead: For patients experiencing complex responsive behaviours, the BSO clinician

Conclusion: The poster presentation will highlight the benefits of the GAIN BSO model of care for patients living with dementia and age-related frailty through patient success stories, quantitative data and evaluation results. Sharing comparative cost analysis of supporting patients to live at home longer will illustrate system level impact of connected, collaborative care. Staff retention statistics and qualitative quotes will be included to demonstrate satisfaction of working in an interprofessional team and how teams collaborate to help patients thrive.

Cortical thinning in patients with cerebral amyloid angiopathy: a cross-sectional and longitudinal analysis

Arsenije Subotic¹, Cheryl R. McCreary², Amanda Nguyen², Feryal Saad², Angela Zwiers², Ana Alvarez², Rannik Sekhon², Andrew E Beaudin², Bruce Pike², Zahinoor Ismail², Eric E Smith²

¹ *Department of Clinical Neurosciences, University of Calgary*

² *University of Calgary*

Background/Objectives: Cerebral Amyloid Angiopathy (CAA) is a small vessel disease characterized by beta-amyloid deposition in the small vessels of the brain and leptomeninges; and is a leading cause of intracerebral hemorrhage and a contributor to dementia. In this study, we investigated both cross-sectional, and longitudinal, patterns of cortical thinning in CAA, and its association with cognition and other biomarkers of CAA pathology.

Methods: As part of the functional assessment of vascular reactivity (FAVR) study and the Calgary Normative Study (CNS), data was collected from 72 healthy controls (mean age 72, 50 female), 48 CAA (mean age 74, 22 female), and 24 Alzheimer's disease (AD) participants (mean age 70, 11 female). Cortical thickness measures were obtained from 3D-T1 weighted images, which were processed using the neuroimaging software FreeSurfer (v6.0.0). Global cortical thickness was calculated as the average of the left and right hemisphere. Neuropsychological test scores were converted to z-scores and grouped into executive function, memory, and processing speed domains. Additional measures included white matter hyperintensity (WMH) volume and cerebral microbleed count. Regions of cortical thinning were inflated onto spherical maps and compared between different groups

using a general linear model in FreeSurfer's command line stream. Longitudinal visits with repeat MRI were conducted at one year after the baseline MRI visit.

Results: Adjusting for age and sex in a multivariable model, global cortical thickness was lower in CAA compared to controls (mean difference (MD)=-0.047mm, 95% confidence interval (95 % CI) -0.099, -0.005, p=0.03). AD participants had a thinner cortex compared to CAA participants (MD=-0.104mm, 95% CI -0.165, -0.043, p=0.001). Thinning in CAA was restricted to parts of the frontal, parietal, and temporal lobes when compared to the control group. Greater thickness was associated with higher memory scores (R²=0.16, p=0.01) and lower WMH volume (R²=0.19, p=0.04) in the CAA group. Longitudinally, CAA participants had a greater rate of cortical thinning compared to controls (MD=-0.041mm/year, 95% CI -0.070, -0.011, p=0.008), although the follow-up cortical thickness was not significantly lower from baseline CAA measurements. No associations were found between thinning over time and cognition, and thinning and other biomarkers of CAA pathology including WMH volume and number of cerebral microbleeds.

Conclusion: Global mean cortical thickness in CAA was lower than controls but higher than AD participants, replicating findings from previous studies suggesting the potential of cortical thickness as a biomarker of CAA pathology. Associations between thickness and memory suggest that cortical thinning in CAA might predict cognitive decline, and the relationship between greater WMH volume and cortical thinning suggest a link between these two biomarkers of brain degeneration. Further research incorporating genetic risk factors, neuroimaging, and physiological measurements such as blood perfusion should be conducted to elucidate potential contributors to cortical thinning in CAA and how this relates to cognitive decline.

Validation of the Mild Behavioral Impairment Checklist for Detection of Neuropsychiatric Symptoms in a Pre-Dementia Clinic Sample

Sophie Hu ¹, Scott Patten ², Gordon Fick ³, Meng Wang ⁴, Zahinoor Ismail ², Eric Smith ⁵

¹ Department of Community Health Sciences, University of Calgary, Calgary, AB, Canada ⁴ Hotchkiss Brain Institute, University of Calgary, Calgary, AB, Canada ⁶ Mathison Centre for Mental Health Research, University of Calgary, Calgary, AB, Canada ⁷ Ron and

² Department of Community Health Sciences, University of Calgary, Calgary, AB, Canada ² Department of Clinical Neurosciences, University of Calgary, Calgary, AB, Canada ³ Department of Psychiatry, University of Calgary, Calgary, AB, Canada ⁴ Hotchkiss Brain

³ Department of Community Health Sciences, University of Calgary, Calgary, AB, Canada ⁵ O'Brien Institute for

Public Health, University of Calgary, Calgary, AB, Canada ⁴ Department of Community Health Sciences, University of Calgary, Calgary, AB, Canada ² Department of Clinical Neurosciences, University of Calgary, Calgary, AB, Canada

⁵ Department of Clinical Neurosciences, University of Calgary, Calgary, AB, Canada ⁴ Hotchkiss Brain Institute, University of Calgary, Calgary, AB, Canada ⁷ Ron and Rene Ward Centre for Healthy Brain Aging Research, University of Calgary, Calgary, AB, Canada

Background/Objectives: Later life emergent neuropsychiatric symptoms (NPS) are now recognized as potential early indicators of dementia. The syndrome of mild behavioral impairment (MBI) defines emergent and sustained NPS in non-demented patients as a marker of risk for future dementia. The MBI-Checklist (MBI-C) is a 34-item five-domain tool to characterize NPS in pre-dementia patients. The Neuropsychiatric Inventory Questionnaire (NPI-Q) is a widely used assessment tool for NPS in dementia. Our aim is to determine the factor structure of the MBI-C in pre-dementia patients in a clinic sample to assess its validity and reliability in comparison to the NPI-Q.

Methods: Subjective Cognitive Decline and Mild Cognitive Impairment patients were recruited through a tertiary Cognitive Neurosciences Clinic in Calgary, Alberta, Canada. Exploratory factor analysis was conducted using multiple imputation of baseline MBI-C (n=179) and NPI-Q (n=427) severity scores. Factors with eigenvalue over one were retained and rotated obliquely with significant items loading onto factors. Internal consistency was measured using Cronbach's alpha.

Results: The MBI-C is a five-factor structure with 29/34 items loading while the NPI-Q is one-factor with 9/10 items loading. MBI-C factors have high internal consistency ($\alpha > 0.80$) while the NPI-Q nears significance ($\alpha = 0.79$). The factors and distribution of items follow the a priori hypothesized structure. Anhedonia and appetite disturbances have been identified as features of apathy related to decreased interest, motivation and drive, rather than depression in this sample.

Conclusion: The MBI-C is a valid and reliable five-factor questionnaire with convergent validity from the NPI-Q. In addition, the MBI-C can detect NPS groupings in pre-dementia patients while the NPI-Q is indicative of a global NPS score and does not perform as well in pre-dementia. The MBI-C serves as a complement to the NPI-Q, encompassing a wider range of NPS and is recommended for assessing NPS in pre-dementia.

Subjective Cognitive Decline and Mild Behavioral Impairment Together Predict Incident Cognitive Decline at 3 Years Better Than Either Syndrome Alone

Sophie Hu¹, Sascha Gill², Eric Smith³, Nils Forkert⁴, Zahinoor Ismail⁵

¹ Department of Community Health Sciences, University of Calgary, Calgary, AB, Canada ⁴ Hotchkiss Brain Institute, University of Calgary, Calgary, AB, Canada ⁶ Mathison Centre for Mental Health Research, University of Calgary, Calgary, AB, Canada ⁷ Ron and

² 5 Hotchkiss Brain Institute, University of Calgary, Calgary, AB, Canada ⁸ Ron and Rene Ward Centre for Healthy Brain Aging Research, University of Calgary, Calgary, AB, Canada

³ 2 Department of Clinical Neurosciences, University of Calgary, Calgary, AB, Canada ⁵ Hotchkiss Brain Institute, University of Calgary, Calgary, AB, Canada ⁸ Ron and Rene Ward Centre for Healthy Brain Aging Research, University of Calgary, Calgary, AB, Canada

⁴ 3 Department of Radiology, University of Calgary, Calgary, AB, Canada ⁵ Hotchkiss Brain Institute, University of Calgary, Calgary, AB, Canada ⁸ Ron and Rene Ward Centre for Healthy Brain Aging Research, University of Calgary, Calgary, AB, Canada

⁵ 1 Department of Community Health Sciences, University of Calgary, Calgary, AB, Canada ² Department of Clinical Neurosciences, University of Calgary, Calgary, AB, Canada ³ Department of Psychiatry, University of Calgary, Calgary, AB, Canada ⁴ Hotchkiss Brain

Background/Objectives: Subjective cognitive decline (SCD) refers to a perceived decline in cognitive abilities. SCD is associated with increased risk of progression to MCI and dementia. However, SCD may also be associated with psychiatric symptoms including depression and anxiety, which may confound its assessment. Mild Behavioral Impairment (MBI) is a validated neurobehavioral syndrome explicitly describing changes in behavior in relation to dementia risk. MBI is characterized by later life emergence of sustained neuropsychiatric symptoms (NPS) as an at-risk state for incident cognitive decline. There are currently no comparative studies of SCD and/or MBI that determine the risk for incident cognitive decline.

Methods: Participants were volunteers at Alzheimer's Disease Centers, with a baseline Clinical Dementia Rating Scale (CDR) of 0 (i.e. cognitively unimpaired). Outcome was a change in cognitive category to CDR>0 at ~3 years. SCD was abstracted from the baseline dataset using Jessen criteria. MBI domains were derived using a transformation of the Neuropsychiatric Interview Questionnaire, mapping NPI-Q items onto MBI domains. Sustained NPS as part of MBI criteria were operationalized as positive NPS scores at baseline and at six months. Odds ratios for cognitive decline at 3 years were calculated for SCD-MBI-, SCD+MBI-, SCD-MBI+, and SCD+MBI+. Patients with psychiatric conditions were excluded from analysis.

Results: Data was analyzed for 2769 participants (mean age =76, 63% females). Of these, 254 had SCD no MBI, 743 had

MBI no SCD, 236 had both SCD and MBI, and 1536 had neither. ORs for incident cognitive decline at 3 years were 3.61 [2.42-5.38] for SCD in the absence of MBI, 4.76 [3.57-6.34] for MBI in the absence of SCD, and 8.15 [5.71-11.64] for SCD with MBI (p<0.0001).

Conclusion: MBI alone had a greater risk of cognitive decline than SCD alone, but the combination of the two constructs described a group consisting of ~10% of the total sample with the greatest risk for cognitive decline (OR=8.15). The systematic incorporation of MBI and SCD into risk stratification is an area with great potential public health significance. Used in conjunction, SCD + MBI could be an inexpensive and efficient method to select those at higher risk for cognitive decline, who may be enriched for biomarker positivity and referred for pharmacological and nonpharmacological dementia prevention programs.

Relative importance of neuroimaging biomarkers in dementia: Predicting global cognition by Apolipoprotein E-ε4 carrier status

Shraddha Sapkota¹, Saira Saeed Mirza², Christopher J. Scott¹, Joel Ramirez¹, Donald T. Stuss³, Mario Masellis¹, Sandra E. Black²

¹ Sunnybrook Health Sciences Centre

² Sunnybrook Health Sciences Centre, University of Toronto

³ Sunnybrook Health Sciences Centre, University of Toronto, Rotman Research Institute of Baycrest Centre

Background/Objectives: Recent biomarker research on neurodegenerative diseases has focused on combinations of multiple risk factors to predict development of cognitive impairment and dementia. In the present study, we use a machine learning approach to examine biomarkers from two important domains (genetics and neuroimaging) to predict global cognition in dementia.

Methods: We used a ~2-year longitudinal sample (followed annually) of cognitively impaired and dementia patients (baseline N=363; mean age=70.83 years; range=37-89 years) from the Sunnybrook Dementia Study. Patients represented Alzheimer's disease, Mild Cognitive Impairment, Vascular Cognitive Impairment, Lewy Body Disease, Frontotemporal Lobar Degeneration, and mixed neurodegenerative cases. We used (1) latent growth modeling and class analyses to estimate classes that best represented global cognition over 2 years (using Mini-Mental State Exam [MMSE]) for APOE ε4-(n=170) and ε4+(n=193) groups, and (2) Random Forest Analysis to test relative predictive importance of structural brain volumes on global cognition. Neuroimaging biomarkers were examined at two levels using Semi-Automatic Brain Region Extraction (pipeline that estimates individualized volumetric profiles). First level comprised of global volumes: normal appearing gray matter (NAGM), normal appearing white

matter (NAWM), deep white matter hyperintensities (dWMH), periventricular WMH (pWMH), deep lacunes (dLACN), periventricular LACN (pLACN), sulcal cerebrospinal fluid (sCSF), and ventricular CSF (vCSF). Second level included 13 corresponding subregion volumes in the left and right hemisphere.

Results: We observed a 2-class model (slow and rapid progressors) for ~2-year MMSE decline in the APOE $\epsilon 4$ - (AIC = 2088.47; BIC = 2113.56; -2LL = 2072.47; Entropy = 0.80) and APOE $\epsilon 4$ + (AIC = 2442.13; BIC = 2468.23; -2LL = 2426.13; Entropy = 0.78) groups. First, for global volumes, we observed that slow MMSE progressors had (1) higher dLACN, lower sCSF and vCSF in the APOE $\epsilon 4$ - group and (2) higher NAGM and lower sCSF in APOE $\epsilon 4$ + group. Second, out of 208 subregions, 9 subregions in the APOE $\epsilon 4$ - and 38 subregions in the APOE $\epsilon 4$ + group significantly discriminated slow and rapid MMSE progressors.

Conclusion: Integration of a machine learning approach across multiple risk domains may (1) identify biomarker profiles of relatively resilient groups across neurodegenerative diseases and (2) lead to personalized medicine to promote healthy brain aging.

Cortical thickness and surface area developmental trajectories in C9orf72 mutation carriers

Gabriella Le Blanc ¹, Simon Ducharme ²

¹ McGill University Faculty of Medicine

² Assistant Professor, Department of Psychiatry, McGill University

Background/Objectives: Frontotemporal dementia is a neurodegenerative dementia leading to behavioral changes and cognitive deficits. About 20% of FTD patients have a genetic variant, the most frequent cause being expansion of chromosome 9 open reading 72 gene (C9ORF72). Studies on cortical morphology changes in C9orf72 mutation carriers have been inconsistent. Cortical thickness (CTh) and surface area (CSA) are two partially genetically independent anatomical measures contributing to the volume of the human cortex. The goal of our project is to analyze developmental trajectories of CTh and CSA to determine when alterations can be detected in C9orf72 carriers compared to healthy age-matched controls.

Methods: The Genetic Frontotemporal Dementia Initiative (GENFI) is a multisite longitudinal study of familial FTD with over 20 research centres in Europe and Canada. Data from symptomatic and asymptomatic gene carriers is collected to aid in developing markers to identify the disease at its early stages. Clinical and imaging from GENFI2 data release 3 were retrieved. 3D-T1 MRI were processed with CIVET 2.1 through CBRAIN to extract CTh and CSA at 81,920 vertices per brain. The final sample after post processing quality control of image processing was 640 scans from 386 subjects

including 55 symptomatic mutation carriers, 83 asymptomatic mutation carriers and 248 healthy controls. Statistical analyses were performed in SurfStat using mixed effects models controlling for age, sex, and scanner site, corrected for multiple comparisons with false discovery rate (FDR).

Results: Analyses contrasting the mutation carrier group (symptomatic and asymptomatic) to controls demonstrated diffuse reduction in the frontal, temporal and parietal lobes for both CTh and CSA. A significant linear 'age by gene carrier status' interaction on CTh with the C9orf72 gene mutation was found, showing that the group differences were better explained by a linear acceleration of thinning in mutation carriers prior to symptom onset, rather than a quadratic model with normal cortical aging followed by rapid atrophy around disease onset. The same interaction was also found significant on CSA, however in more restricted areas. The contrast analyses between at-risk presymptomatic mutation carriers only and controls also demonstrated reduced thinning, but in more restricted fronto-temporo-parietal areas.

Conclusion: These results depict the differences in cortical aging for C9orf72 mutation carriers versus healthy controls, showing that faster thinning can be observed prior to disease onset compared to healthy controls. These results are in line with other evidence suggesting that disease-related brain changes start several years prior to symptom onset in genetic FTD.

Validation of the English version of the Dépistage Cognitif de Québec, a new screening tool for atypical dementias

Synthia Meilleur-Durand ¹, Marianne Lévesque ¹, Frédéric St-Onge ¹, Mario Masellis ², Stephen Cunnane ³, Sylvia Villeneuve ⁴, Brandy Callahan ⁵, Serge Gauthier ⁶, Pamela Jarrett ⁷, Ging-Yuek Robin Hsiung ⁸, Robert Jr. Laforce ¹

¹ Clinique interdisciplinaire de Mémoire de l'Enfant-Jésus, CHU de Québec

² Sunnybrook Health Sciences Centre

³ Research Center on Aging, Sherbrooke University

⁴ Department of Psychiatry, Faculty of Medicine, McGill University

⁵ Hotchkiss Brain Institute, University of Calgary, Mathison Centre for Mental Health Research & Education

⁶ AD Research Unit, McGill Center for Studies in Aging Douglas Mental Health Research Institute

⁷ Horizon Health Network, Dalhousie University

⁸ Department of Medicine, University of British Columbia

Background/Objectives: Dramatic increase in dementia prevalence poses a challenge to public health. Early detection of atypical dementia remains difficult, mainly because of the absence of tools specifically developed for this purpose. Such delays deprive patients from the benefits of rapid management. The Dépistage Cognitif de Québec (DCQ, www.dcqtest.

org) was developed by behavioral neurologists and clinical neuropsychologists at Clinique Interdisciplinaire de Mémoire (CIME; CHU de Québec). Validated among 628 patients and controls, it is very sensitive and specific for the detection of atypical dementia. Recently, the DCQ has been translated into English. This study aimed to validate the English DCQ.

Methods: The DCQ targets five relevant cognitive domains: memory, visuospatial, executive, language, and behaviour. It has been translated and adapted to English. A backward translation has been completed. Four social cognition situations have been added to the Behavioral Index. Equivalence between the English and French version has been assessed by the administration of both tests to 30 bilingual participants. Normative data is provided for a sample of 200 English-speaking participants aged 50 years and over. This prospective multicentre study is conducted in ten centres across Canada and United States, namely at the Sunnybrook Research Institute, the Glendon Centre for Cognitive Health, the Hotchkiss Brain Institute, the Douglas Mental Health University Institute, the McGill University Research Centre for Studies in Aging, the UBC Clinic for Alzheimer Disease and Related Disorders, Sherbrooke University, Dalhousie University and University of California in San Diego.

Results: We provide normative data for a population-based sample of 200 English-speaking controls aged 50 years and over. The equivalence between the French and English version, test-retest reliability, inter-rater reliability and internal consistency is also evaluated. We are hopeful that the English DCQ will have excellent psychometric properties, just as the French DCQ.

Conclusion: The English DCQ was developed using updated criteria for the behavioural variant of frontotemporal dementia, Alzheimer's disease variants, Posterior Cortical Atrophy, dementia with Lewy bodies, and primary progressive aphasia. It is very sensitive in detecting atypical dementias. Furthermore, it offers an alternative when brief screening tools are insufficient or when extensive neuropsychological evaluation is unavailable. Validation of the English translation will allow a wider international use of the DCQ. Worldwide, it is also hoped to provide earlier diagnosis of atypical dementias.

Towards Identifying dementia-specific predictors of potentially avoidable emergency department transfers from long-term care

Deniz Cetin-Sahin ¹, Isabelle Vedel ¹, Greta G. Cummings ², Tibor Schuster ¹, Mark Karanofsky ¹, Mabelle Wilchesky ¹
¹ McGill University, Department of Family Medicine
² University of Alberta, Faculty of Nursing

Background/Objectives: Long-term care (LTC) residents, the majority of whom have dementia, are often transferred to

emergency departments (EDs) during episodes of acute clinical decline. "Potentially avoidable" ED transfers (PAEDTs) represent healthcare system inefficiencies, can cause adverse outcomes (e.g., delirium), and in Canada in 2014, PAEDTs represented 34% of all ED visits from LTC. In order to tailor care to the needs of LTC stakeholders, the associations between PAEDTs, dementia-specific predictors (dementia subtype, severity) and other comorbidities require investigation. As the first step towards this goal, we described LTC PAEDT patterns within one Integrated Health and Social Services University Network in Quebec.

Methods: A retrospective cohort of residents transferred to one tertiary care hospital between April 2017 and March 2019 from 7 publicly funded LTC sites (1,189 beds total) was identified from an ED registry. PAEDTs were identified using established Canadian Institute of Health Information (CIHI) definitions based on principal ED diagnoses, triage acuity codes, and discharge dispositions. PAEDTs included visits for conditions for which proper primary care management could have been effective (e.g., pneumonia), or visits classified as low acuity (levels 4 and 5 of the Canadian Triage and Acuity Scale) where there is no subsequent inpatient admission and the patient is returned directly to LTC. Descriptive statistics were conducted for resident sex, age, ED length of stay (LOS), admission to hospital, and death in the ED.

Results: Our cohort included a total of 1,236 transfers by 692 residents: 416 (60%) of residents had 1 ED visit, while one resident had as many as 12 visits during this 2-year period. PAEDTs accounted for 35% of all ED visits. The most frequent PAEDT diagnoses included pneumonia (19%), congestive heart failure (15%), urinary tract infection (UTI) (11%), chronic obstructive pulmonary disease exacerbation (8%), implanted device adjustment (8%), and cellulitis (5%). A total of 207 visits (17%) had a low acuity triage score. Female residents accounted for 50% of all transfers. Mean±SD age of our sample was 81±12 years. Mean±SD LOS was 26±19 hours, 43% of residents were admitted to hospital, and 3% died in the ED.

Conclusion: Our preliminary results indicate that PAEDT rates in our Quebec LTC sample were comparable to those reported by CIHI. A difference, however, was observed in the relative distribution of PAEDT diagnoses. For example, whereas UTIs contributed to 30% of PAEDTs in Canada, they contributed to 11% in our Quebec sample, potentially indicating superior in-house management of this condition. Detailed clinical data are currently being collected from LTC medical charts and electronic pharmacy records. Next steps include identifying dementia-specific PAEDT-predictors controlling for other resident and LTC-level characteristics with a view to improving the quality of care for this vulnerable population.

Exploring predictive models of Alzheimer's disease severity based on resting state EEG and MRI features.

Belmir J. De Jesus Jr ¹, Raymundo Cassani ¹, Marco Cecchi ², K. C. Fadem ², William J. McGeown ³, Tiago H. Falk ¹

¹ Institut National de la Recherche Scientifique

² Cognision

³ School of Psychological Sciences and Health, University of Strathclyde

Background/Objectives: Diagnosing and monitoring Alzheimer's disease (AD) requires specialized and trained clinicians along with procedures that can be uncomfortable for patients. Automated tools, in turn, can provide accurate and repeatable results while remaining affordable. To this end, here we explore automated predictive models based on resting-state electroencephalography (rsEEG) and structural magnetic resonance imaging (MRI) to characterize AD severity.

Methods: Five different groups of features were used in the study. Four groups corresponded to summary statistics of rsEEG features acquired from 89 subjects diagnosed with mild AD (MMSE 21-26) utilizing raw (group A) and pre-processed (group B) signals, as well as 32 subjects diagnosed with moderately severe AD (MMSE 4-26) utilizing raw (group D) and pre-processed (group E) signals. The fifth group (C) corresponded to features derived from structural magnetic resonance imaging (MRI) scans from the same 89 mild AD subjects. Spearman correlation coefficients between each of the groups and the MMSE score of the subjects were ranked. The top-10 features that lead to the best correlation coefficients *C* were selected to form feature sets 1, 2 and 3, respectively. Next, feature set 4 corresponded to the top features that ranked highly for both groups A and D, and feature set 5 for groups B and E. Feature sets were then combined and four regression models were explored, namely: multiple linear regression (LR) [3], support vector machine regression with linear (SVM-Linear) and Gaussian (SVM-RBF) kernels [4], and random forest regression (RF) [5]. All models were implemented using the open-source scikit-learn library for python [6]. Before training, min-max normalization was applied to all the selected features. Root mean squared error (RMSE) was selected as the evaluation metric, and 10-fold cross-validation (CV) was applied. In addition, grid search was implemented to determine the optimal parameters to be used in each model.

Results: From the overall analysis, all the averaged RMSE results were below 10% of the average MMSE score (i.e., 2.333). The best result was achieved from the combination of features from feature sets 1 and 3 using the SVM with linear kernel. On the other hand, the models which used the linear regression algorithm seemed to perform worse for most of the groups. Analyzing features sets from individual modalities, it

was observed that the features derived from raw EEG resulted in better performance when compared to pre-processed features. Additionally, the models using only the MRI features achieved better estimates than the models trained with only EEG features, but improved performance was achieved with the combined set, thus suggesting complementarity between the two modalities.

Conclusion: This study explored the possibility of providing a convenient method for modelling MMSE scores with features derived from rsEEG and MRI. These preliminary results show promising potential for developing a convenient and accurate model to characterize Alzheimer's disease severity.

Preventing Social Isolation and Increasing Social engagement of Older Adults through Innovative Uses of Information and Communication Technology

Charlene Chu ¹, Natalia Zdaniuk ², Rosalie Wang ²

¹ Lawrence S. Bloomberg Faculty of Nursing, University of Toronto

² Department of Occupational Science & Occupational Therapy, University of Toronto

Background/Objectives: Older adults with cognitive impairment (CI) experience high rates of social isolation (Cacioppo, 2014) and depression. Information and communication technologies (ICT) may provide the opportunity for older adults with CI to participate in social roles within their community which is critical to aging well. While a significant amount of research shows the challenges older adults have using ICT, there are fewer accounts of the ways in which older adults use ICT to overcome their CI and remain engaged in their social circles. This study seeks to explore the innovative ways older adults with CI use ICT to enhance their social

Methods: Methods: In-depth Interviews with 31 older adults with CI (56-96 years old; 66% female; diagnosed dementias and subjective CI) who were ICT users (e.g. tablets, internet, cell phones) were conducted in Toronto, Ottawa, and Montreal, Canada between Sept 2018 to May 2019. Participants lived either in the community or residential care homes. The interviews explored the role of ICT to stay socially engaged (e.g. connected to other people or networks) and participate in society. The interviews were audiotaped and transcribed word for word. Content analysis using line by line coding was completed by two team members. Through discussion with other research team members, similar codes were collapsed into themes.

Results: Three themes emerged: 1) The functioning in society referring to older adults' innovative uses of ICT to overcome their CI and associated feelings of self-doubt. For example, sending text messages to themselves before starting a task in order to prevent forgetting the task at hand minutes later,

taking pictures and adding a description to remember details, and setting alarms throughout the day. 2) Maintenance work of relationships encapsulates the “behind the scenes” actions that facilitate feeling connected to others such as contact lists with extremely detailed entries, or overcoming fear and anxiety of getting lost by using Google Street View to “walk through” a route before a journey to meet a friend. And 3) Connection to others and community refers to their process of reconstituting social relationships through ICT. For instance, the use of Google earth and street view to see where grandchildren live, population social media and video/chat applications.

Conclusion: Our study highlights the resourcefulness of older adults with CI. ICT was used in a multitude of ways by older adults, namely to navigate feelings of fear and self-doubt stemming from their CI (internal), as well as a facilitator to social connections and engagement (external). Despite the common myth that older adults with CI cannot engage with a myriad of digital technologies, the findings challenge this ageist convention that older adults with CI are not technology adept and contribute to broadening our understanding of the importance of ICT and their capability to enhance social engagement.

The Dépistage Cognitif de Québec in Unilingual and Bilingual Anglophones: A Validation Study

Marianne Lévesque¹, Synthia Meilleur-Durand¹, Marie-Christine Ouellet², Alison Cassivi-Joncas¹, Frédéric St-Onge¹, Mario Masellis³, Stephen Cunnane⁴, Sylvia Villeneuve⁵, Robert Jr Laforce¹

¹ *Clinique interdisciplinaire de mémoire (CIME), Centre de recherche du CHU de Québec, Hôpital de l'Enfant-Jésus*

² *Centre interdisciplinaire de recherche en réadaptation et intégration sociale (CIRRIS)*

³ *Sunnybrook Health Sciences Centre*

⁴ *Research Center on Aging, Sherbrooke University*

⁵ *Department of Psychiatry, McGill University*

Background/Objectives: Cognitive abilities between unilingual and bilingual individuals often differ, making it important to obtain normative data for both groups when validating new cognitive screening tools. The Dépistage Cognitif de Québec (DCQ, www.dcqtest.org) was recently developed by behavioral neurologists and clinical neuropsychologists at the Clinique Interdisciplinaire de Mémoire (CIME; CHU de Québec) for the screening of atypical dementia. We aimed to collect normative data for the English validation of the DCQ among healthy older adults and to compare performance between bilingual and unilingual Anglophones.

Methods: The English translation of the DCQ is currently being validated amongst 200 healthy anglophones aged 50 years and over, in various North American sites. Amidst the anglophone participants recruited, 40 randomized unilingual

individuals will be selected and compared to 40 aged-matched proficient bilingual anglophones. Bilingual proficiency will be established using the Language Experience and Proficiency Questionnaire (LEAP-Q).

Results: Total DCQ scores, as well as scores for each of its 5 indexes (Memory, Visuospatial, Executive, Language and Behavioral), will be compared between unilingual and bilingual participants. Preliminary results will be available in September 2019.

Conclusion: Comparison between bilingual and unilingual Anglophones will help identify possible cognitive differences in their performance on the DCQ. Ensuring that possible differences are considered is crucial for the DCQ's future clinical use, as assessments could otherwise be subject to misinterpretation, inaccurate diagnoses and treatment recommendations.

Primary care continuity and avoidable acute hospital use in community-dwelling persons with dementia: an impact evaluation

Claire Godard-Sebillotte¹, Isabelle Vedel¹, Nadia Sourial¹, Louis Rochette², Eric Pelletier², Erin Strumpf³

¹ *Department of Family Medicine, McGill University, Montreal, Quebec, Canada*

² *Institut national de santé publique - Québec (Québec Canada)*

³ *Department of Epidemiology, Biostatistics, and Occupational Health, McGill University, Montreal, Quebec, Canada. Department of Economics, McGill University, Montreal, Quebec, Canada.*

Background/Objectives: Persons with dementia have twice the acute hospital use (Emergency Department (ED) visits, hospital admissions) as older persons without dementia. Reducing avoidable acute hospital use in persons with dementia is a global healthcare priority. While primary care continuity could be an important determinant of avoidable acute hospital use in dementia, to our knowledge, there is no study of the impact of primary care continuity on avoidable acute hospital use in dementia. Our aim was to measure the impact of primary care continuity on total and avoidable acute hospital use in persons with dementia in Quebec (Canada).

Methods: Design: Quasi-experimental study of a 4-year retrospective cohort (April 2012-March 2016). Setting: Quebec. Population: Every community-dwelling 65+ persons with prevalent dementia on the 31st of March 2015, with at least 2 primary care visits during 2014-2015. Exposure: High primary care continuity in 2014-2015 (Bice Boxerman index). Outcomes: Total and potentially avoidable acute hospital use in 2015-2016. Data source: Qc health administrative database. Analyse: Comparison of acute hospital use between those with high continuity of care to those with low continuity of care,

using inverse probability of treatment weighting (IPTW) on the propensity scores. Propensity score modeled the probability of having high primary care continuity. IPTW and the propensity score are cutting-edge impact evaluation methods of natural experiment, and non-randomized health policy.

Results: In the included 22060 persons, 14515 (65.8%) had high continuity of primary care. The persons with high continuity of care were more often rural, and had less ED and ambulatory visits in 2012-2014. After IPTW, these differences became negligible. High primary care continuity was associated with significantly less potentially avoidable hospitalization among the exposed for three indicators: the absolute risk reduction of Ambulatory Care Sensitive Conditions hospitalization (aging population definition) was 1.20 (CI 95% [0.59; 1.81], and the number needed to treat was 83 (CI 95% [55; 169]); the absolute risk reduction of Ambulatory Care Sensitive Conditions hospitalization (general population definition) was 0.93 (CI 95% [0.48; 1.39], and the number needed to treat was 107 (CI 95% [72; 210]); the absolute risk reduction of at least one 30-day readmission was 1.03 (CI 95% [0.53; 1.53], the number needed to treat was 97 (CI 95% [65; 190]).

Conclusion: Among community-dwelling 65+persons with prevalent dementia in Quebec, high primary care continuity was associated with significantly less avoidable acute hospital use as measured by Ambulatory Care Sensitive Conditions hospitalization, and 30-day readmission. Further research should investigate whether increasing primary care continuity might be an avenue to reduce avoidable acute hospital use in community-dwelling persons with dementia, in order to inform evidence-based policies to reduce avoidable acute hospital use in this population.

Quality of dementia care in family medicine groups: a sex-based analysis of the Quebec Alzheimer's plan

Eva Margo-Dermer, Hilah Silver, Geneviève Arsenault-Lapierre, Nadia Sourial, Isabelle Vedel
Department of Family Medicine, McGill University

Background/Objectives: People with neurocognitive disorders (NCDs), receive lower quality of care. Sex and gender affect the etiology and symptomatology of other diseases, but little is known on sex-based differences in quality of care in NCDs. The Quebec Alzheimer's Plan (QAP) was implemented in 42 Family Medicine Groups in 2012 to improve detection, diagnosis, treatment and management of NCDs in primary care. It provides an opportunity to study differential effects of the QAP. This study aims to evaluate the interaction between sex and the QAP on quality of follow-up and describe differences in frequencies at which quality of follow-up indicators are received.

Methods: A randomized retrospective chart review was conducted in 13 Family Medicine Groups (FMGs) that participated in the initial QAP implementation. 945 randomly sampled charts of patients with NCDs pre and post-QAP implementation were reviewed. Quality of follow-up scores were calculated using 10 binary sub-indicators of quality of follow-up (based on the validated ACOVE approach). Linear regression analyses modelled the interaction between sex and quality of follow-up pre-and post-QAP, accounting for confounders (age, number of medications) with multivariate analyses. A descriptive analysis of the frequency differences of each quality of follow-up indicator was conducted to tease apart differences in care for men and women.

Results: Pre-QAP implementation, men and women's quality of follow-up scores were equivalent: 44.12 and 44.15 respectively (95% CI: -3.80 - 3.73). Following QAP implementation, men's and women's mean quality of follow-up scores were respectively 55.34 and 49.90 (95% CI: 2.05 - 8.82). The linear regression analysis revealed a significant interaction effect between sex and quality of follow-up: following QAP implementation, men's quality of follow-up scores increased by an average of 5.34 more points than women's scores (95% CI: 0.29 - 10.38). In the pre-QAP period, men received 3 quality indicators more frequently than women; post-QAP, this increased to men receiving 7 of the 10 indicators more frequently. The three indicators with the highest margin of difference between men and women in the post-QAP period were: driving status assessments (39% higher frequency for men), management of Alzheimer's medications (16% higher frequency for men) and cognitive testing (15% higher frequency for men).

Conclusion: Results from this sex-based analysis reveal that the effect of the QAP on quality of follow-up scores was different for men and women. Despite improvements in quality of follow-up care for people living with neurocognitive disorders, the Quebec Alzheimer's Plan has not closed the gap between men and women's quality of care. Further research is required to determine the mechanism of the differential improvements by sex and to narrow the gap in quality of care received by men and women. This research highlights the need for a call to action on equitable delivery of dementia care.

Differences in plasma inflammatory biomarkers in Alzheimer's patients

Rod Vafaei¹, Alice C Fok², Ging-Yuek R. Hsiung²
¹ *Faculty of Medicine, UBC*
² *Division of Neurology, Dept of Medicine, UBC*

Background/Objectives: To date, Alzheimer's disease (AD) treatments have failed to cure or significantly slow disease progression. It has been suggested that treatment ineffectiveness might be attributed to late diagnosis of AD such that

the level of damage is already too great. Identifying plasma biomarkers in AD patients would open the door for screening diagnostics which may improve treatment prognosis. One potential avenue is the detection of changes in peripheral inflammatory markers as inflammation is a major component of AD pathogenesis. We aim to investigate if cytokines and chemokines are changed in the plasma of AD patients compared to cognitively health controls.

Methods: 41 AD (17 female, 24 male) and 19 control (12 female, 7 males) plasma samples from the University of British Columbia (UBC) Hospital Clinic for Alzheimer and Related Disorders were analyzed using multiplex ELISA assays. We used Meso Scale Discovery (MSD) VPlex Chemokine Panel 1, MSD VPlex Cytokine Panel 1, and MSD VPlex Proinflammatory Panel 1 to compare AD patients and controls for differences in plasma inflammatory cytokine and chemokine concentrations. Results were assessed for significance using a two-tailed, unpaired student t-test.

Results: IL-1 α (1.46 pg/mL in AD and 1.08 pg/mL in control, $p = 0.05$) and TNF- α (1.77 pg/mL in AD and 1.51 pg/mL in control, $p = 0.03$) were found to be significantly elevated in AD patient peripheral plasma samples compared to control plasma samples. Other inflammatory cytokines such as IL-2 and IFN- γ also showed trends suggesting a difference between cases and controls but did not confer significance at this sample size.

Conclusion: The results of this preliminary pilot study suggest that the concentration of inflammatory markers found in the peripheral plasma of AD patient's is different than that of controls. Specific cytokines of interest include IL-1 α and TNF- α . We will be conducting a follow-up to this study with a larger sample size to confirm the significance of our preliminary finding and to evaluate other cytokines that may be promising.

Short form scoring algorithm for a computer-based cognitive screening instrument

*Jake Ursenbach, Megan O'Connell, Julie Kosteniuk, Debra Morgan
University of Saskatchewan*

Background/Objectives: The diagnosis of common forms of dementia, such as dementia due to Alzheimer's disease, should be completed by primary care providers. Barriers to timely diagnosis in primary care includes insufficient training and time to administer cognitive testing. The Computerized Assessment of Memory and Cognition - Research (CAMCI-R) is a tablet-computer based battery, but its usefulness in primary care is limited by the absence of a summary score. The CAMCI-R takes about 25 minutes to administer, which is an additional drawback. To address these issues, we developed an algorithm for a short form with adequate classification accuracy.

Methods: We completed a secondary analysis of a dataset with diagnosis of mild cognitive impairment (MCI) or normal based on a separate neuropsychological battery. We divided this into two datasets (training and cross-validation), and we applied a bootstrapping procedure to develop a logistic regression model using the principal components of all CAMCI-R scores ('full test model'). We subsequently used backwards stepwise logistic regression of the CAMCI-R scores to remove subtests, and stopped when the short-form model accounted for 95% of the variance of the 'full test model' after weighting the change in variance by a scaling factor based on subtest duration, thus shortening the battery while accounting for length of subtest administration. From the bootstrapped models (completed across 5,000 bootstrapped samples), median performing models (with cut offs based on Youden's J statistic to maximize both sensitivity and specificity) were selected and evaluated within a cross-validation sample.

Results: The median model from the 5,000 bootstrapped samples with the full CAMCI-R demonstrated adequate evidence for classification accuracy within the cross-validation sample (area under curve (AUC) = 0.82 [95% confidence interval (CI) 0.77 - 0.87]), and at Youden's optimal threshold cut off, the sensitivity was 0.74 [0.64 - 0.82] and the specificity was 0.79 [0.72 - 0.85]. The completion time for the full CAMCI-R is 24.0 minutes for most older adults. In contrast, the test duration of the short form was 9.3 minutes, but the short-form demonstrated slightly poorer classification accuracy (AUC = 0.80 [0.74 - 0.85], at Youden's cut off sensitivity = 0.74 [0.64 - 0.82] and specificity = 0.70 [0.63 - 0.77]) relative to the full CAMCI-R.

Conclusion: We developed interpretive algorithms for the CAMCI-R that estimate the probability that an older adult in a primary care setting would be classified as cognitively impaired or as cognitively normal for the full CAMCI-R and a short-form. The short-form was less than half the duration of the long form without a dramatic loss to classification accuracy. As an illustrative example, if the CAMCI-R short-form was used to screen 1000 older adults in a population with an 8.4% base rate of MCI, the predictive values are estimated to be: 62 true positives, 25 false positives, 22 false negatives, and 59 true negatives.

The interaction of age, dementia and postoperative opioid prescriptions in older adults undergoing surgery for hip fracture

*Jennifer Bethell¹, Mark D Neuman², Brian T Bateman³,
Andrea Hill⁴, Hannah Wunsch⁵*

¹ KITE, Toronto Rehabilitation Institute, University Health Network

² University of Pennsylvania

³ Brigham and Women's Hospital

⁴ Sunnybrook Research Institute

⁵ Sunnybrook Health Sciences Centre

Background/Objectives: Pain after surgery is one of the most common indications for initiating opioids, however, when considering opioids for older adults, guidelines advise prescribers to limit dosage. Conversely, there is also evidence that pain is often under-detected and undertreated in those with dementia. Our objective was to describe postoperative opioid prescribing for older adults undergoing surgery for hip fracture - by age and stratified by dementia. We hypothesized that increasing patient age would be associated with lower likelihood of filling a postoperative opioid prescription, fewer strong opioids dispensed and lower total milligram equivalent (MME) dosage.

Methods: This retrospective cohort used population-based data from Ontario. We included hip fracture episodes, among individuals aged 66 years and older, that were surgically treated in an acute care hospital in Ontario, Canada between July 2013 and March 2017. For those with more than one eligible procedure during the study period, we selected only the first. Exclusions included those with (1) opioid prescriptions filled within the previous year with total duration greater than 7 days, (2) discharge destinations other than home or long-term care, (3) surgical length of stay greater than 30 days, and (4) death during admission or within 30 days of discharge. We defined postoperative opioid prescriptions as analgesic prescriptions filled on the surgery discharge date or within 6 days subsequent. We defined the first prescription(s) filled during these 7 postoperative days as the index prescription(s) then described them according to the type of opioid and total MME.

Results: Among 7,037 opioid-naïve older adults undergoing surgery for hip fracture, 60.9% filled an opioid prescription within 7 days of hospital discharge. Among those without dementia, as age increased, fewer patients filled a postoperative opioid prescription (70.6% for those age 66-74 years, decreasing to 47.3% for those age 90 years or older; $p < 0.0001$). Among those who did fill a prescription, older age was associated with fewer patients filling a prescription for a strong opioid (i.e., fentanyl, hydromorphone, oxycodone or morphine; $p < 0.0001$) and lower median total MME. These age-related trends were not apparent among those with dementia.

Conclusion: Age is associated with changes in opioid prescribing patterns after hip fracture surgery, but only for individuals without dementia. Further research is needed to enable safe and effective postoperative opioid prescribing, including specifically for older adults and those with dementia.

A multiple case study exploring PTSD in Veterans with dementia living in long-term care

Kim Ritchie¹, Heidi Cramm¹, Alice Aiken², Catherine Donnelly¹, Katie Goldie¹

¹ Queen's University

² Dalhousie University

Background/Objectives: Post-traumatic Stress Disorder (PTSD) can emerge, re-emerge, or worsen in Veterans following the onset of dementia, resulting in a range of distressing symptoms, including intrusive war memories, nightmares, and paranoia. In long-term care facilities, environmental and interpersonal triggers may be present, resulting in exacerbation of PTSD symptoms. This situation can result in behavioural challenges, such as physical aggression towards staff and/or other residents, which often requires pharmacological intervention and additional strategies to ensure patient and healthcare provider safety is maintained. This study aims to explore and better understand PTSD symptoms in Veterans with dementia from the perspectives of Veterans, caregivers,

Methods: A multiple case study is currently underway in two Veteran long-term care facilities in Ontario. There are a total of 4 cases being investigated, and each case is defined as a triad consisting of a Veteran with PTSD symptoms and dementia, along with their caregiver and health care providers. Data collection involves interviews, observation, and document review. Semi-structured interviews are conducted with each Veteran, their caregiver and three health care providers [1 Personal Support Worker (PSW), 1 Registered Nurse/ Registered Practical Nurse (RN/RPN), and 1 Nurse Practitioner (NP)/ Physician (MD)]. These health care providers are all involved in the care of long-term care residents and represent different levels of interaction. Unstructured non-participant observation focuses on the Veteran in their physical and social environment. The third form of data collection involves a detailed chart review, including the care plan and progress notes. Thematic analysis is used as an overall strategy to

Results: Preliminary results have found that Veterans with PTSD symptoms and dementia have increased intensity of symptoms relative to Veterans with dementia. Veterans with PTSD symptoms and dementia are described as having suspiciousness, fear, and anger that interferes with their ability to accept help from others. Health care providers experience challenges related to the management of PTSD symptoms, as typical dementia strategies such as redirection are often ineffective. Awareness of trauma related triggers and developing trust result in more effective management of PTSD symptoms. Findings from all 4 cases will be presented at the conference.

Conclusion: Our findings are the first to document particular experiences of Veterans with PTSD symptoms and dementia who are living in long-term care facilities. The results of this study can be used to inform care plan strategies to help health care providers support Veterans and their caregivers. The findings can also be used for the development of education for health care providers who care for Veterans with PTSD symptoms and dementia.

Health care providers' experiences in learning to identify PTSD in Veterans with dementia in long-term care

Kim Ritchie¹, Heidi Cramm¹, Alice Aiken², Catherine Donnelly¹, Katie Goldie¹

¹ Queen's University

² Dalhousie University

Background/Objectives: Many health care providers who work in long-term care are unfamiliar with the symptoms of PTSD in Veterans with dementia. Current PTSD screening tools have not been adapted for individuals with cognitive impairment, and organizational assessments may not capture Veteran status, or past military trauma. Sensitizing health care providers to the possibility of PTSD requires a greater understanding of how to identify the symptoms of PTSD when they are caring for Veterans with dementia. The aim of this study is to explore the experiences of Canadian health care providers in learning to identify PTSD symptoms in Veterans with dementia.

Methods: This is the third phase of a larger study aimed at understanding and identifying PTSD in Veterans with dementia living in long-term care. Critical incident technique will be used to gather in-depth information about past care experiences from key informants across Canada. Key informants are defined as health care professionals in Canada, who have expertise in the identification of Veterans with PTSD symptoms, and are English-speaking. Purposeful sampling will recruit individuals who meet the inclusion criteria followed by snowball sampling. It is estimated that 10 health care providers will be needed to achieve theoretical saturation.

Results: Framework analysis will develop themes from the perspectives of the health care providers. Results will be reported at the conference.

Conclusion: The findings of this study will improve knowledge on how Canadian health care providers can identify and differentiate PTSD in Veterans with dementia from Veterans with dementia only. This information could be used to inform training and education of health care providers working in long-term care so they can better support Veterans and their caregivers.

Dementia and utilization of physician specialist services: A population-based study of older adults in Ontario

Dallas Seitz¹, Mahin Delara²

¹ Division Head, Geriatric Psychiatry; Associate Professor, Department of Psychiatry, Queen's University, Providence Care - Mental Health Services

² Postdoctoral fellow, Department of Psychiatry, Queen's University, Providence Care-Mental Health Services

Background/Objectives: The Ontario population is aging with an estimate of 225,000 individuals currently diagnosed with dementia. Understanding the population characteristics of older adults with dementia is required to facilitate planning of health care services and also to ensure the optimal access to services. There is limited information about the current access of this population to medical specialists in Ontario and the factors causing variation in their access. This study describes the characteristics of older adults with dementia and their patterns of geriatric specialists and neurologists service use in Ontario and by local health integration network (LHIN).

Methods: Using administrative healthcare databases available at ICES-Queen's University, this cross-sectional study was conducted on all adults aged between 66 and 105 years old residing in Ontario. The inclusion criteria were having a valid Ontario health insurance coverage on April 1, 2018 (the index date) and a minimum of one year of information on prescribed medications available in Ontario Drug Benefit (ODB) database. A valid ICES case algorithm was used to identify individuals with dementia. The patterns of physician service use were identified using the main specialty designation of the physician in the Ontario Health Insurance Plan (OHIP) database.

Results: A total of 173, 205 individuals with physician diagnosed dementia were identified with a median age of 82 years. The majority of cases were females (63%) and 33% were residing in long term care (LTC) facilities. In the year preceding the index date, 96% of dementia cases received at least one physician visit, 36% had at least one emergency visit, 24% were hospitalized and 48% received any home care services. The total number of older adults with dementia varied from 22,388 individuals in the Central LHIN (13% of all dementia cases) to 3,324 individuals (2% of all dementia cases) in the North West LHIN. While 17% of individuals with dementia received any geriatric medicine service in the preceding year, psychiatrists and neurologists provided equal amount of services to people with dementia (11%). The community setting was the most common setting for all specialist services, followed by hospital and LTC facilities.

Conclusion: At the current time, the availability of physician specialist services for dementia population in Ontario is relatively limited. More efforts are required to optimize the Ontario physician workforce in terms of the numbers of specialized services. Enhancement of current interdisciplinary models of care is recommend to improve access to specialized services for older adults with dementia.

Investigating the contribution of white matter hyperintensities to neuropsychiatric symptoms and social cognition deficits in patients with neurodegenerative diseases

Miracle Ozzoude¹, Brenda Varriano¹, Paula McLaughlin², Angela Troyer³, Robert Bartha⁴, Sean Symons⁵,

Donna Kwan ⁶, Brian Tan ⁷, Richard H. Swartz ⁵, Gustavo Saposnik ⁸, Maria C. Tartaglia ¹

¹ *Tanz Centre for Research in Neurodegenerative Diseases, University of Toronto, Toronto, ON, Canada*

² *Schulich School of Medicine and Dentistry, Western University, London, ON, Canada*

³ *Rotman Research Institute of Baycrest Centre for Geriatric Care, Toronto, ON, Canada*

⁴ *Robarts Research Institute, Western University, London, ON, Canada*

⁵ *Sunnybrook Health Sciences Centre, Toronto, ON, Canada*

⁶ *Queens University, Kingston, ON*

⁷ *Rotman Research Institute of Baycrest Centre, Toronto, ON, Canada*

⁸ *Li Ka Shing Knowledge Institute, St. Michael's Hospital, University of Toronto, ON, Canada*

Background/Objectives: Neurodegenerative diseases, in addition to cognitive impairment, also include neuropsychiatric symptoms (NPS) and social cognition deficits[1]. NPS and social cognition deficits contribute to caregiver burden and patient distress[2]. White matter hyperintensities (WMH) likely reflect ischemic damage and have been implicated in NPS. Increased frontal WMH volumes and worse depression and delusions has been observed in patients with Alzheimer's disease, vascular dementia, and dementia with Lewy bodies[3,4]. A negative association was seen between WMH and social cognition in patients with small vessel disease[5]. Our study examined the associations between WMH, NPS, and social cognition deficits across patients with neurodegenerative diseases.

Methods: We examined 126 AD, 140 PD, 52 FTD, 40 ALS, and 155 VCI patients from the Ontario Neurodegenerative Research Initiative (ONDRI) study. All participants underwent structural MRI (3T), and NPS assessment using NP inventory questionnaire (NPI-Q). Social cognition was measured using: 1) Social behaviour = Revised Self-Monitoring Scale (RSMS), 2) Empathy = Interpersonal Reactivity Index (IRI), and 3) Social boundaries = Social Norms Questionnaire (SNQ). WMH volumes were measured using a previously validated MRI-based volumetric method [6], and subdivided by hemispheric lobes. ANOVA was used for continuous variables. Linear regressions were used to determine the degree to which regional WMH (rWMH), age, cognition, disease group (Dx), gender contributed to NPS and social cognition. Interaction terms (Dx*rWMH) were separately entered into the regression analyses to determine whether the associations between rWMH, NPS and social cognition vary across the Dx.

Results: FTD scored significantly lower on IRI ($p = 0.002$) and RSMS ($p < 0.0001$), compared to other groups. VCI had significantly increased rWMH compared to other groups, except in left occipital ($p < 0.0001$). FTD scored significantly higher on both NPS severity and distress, ($p < 0.0001$). WMH

in the left basal ganglia and thalamic regions contributed to IRI in the VCI cohort ($B = -1.574$, $p = 0.022$); right basal ganglia and thalamic regions contributed to IRI in the PD cohort ($B = -1.256$, $p = 0.020$). WMH in left basal ganglia and thalamic regions contributed to NPS severity ($B = 2.818$, $p = 0.001$) and caregiver distress ($B = 3.969$, $p = 0.001$) in the FTD cohort; WMH in right basal ganglia and thalamic regions contributed to caregiver distress ($B = 3.897$, $p = 0.036$) in the ALS cohort.

Conclusion: As expected, patients with FTD have worse social cognition (lack of empathy and decreased social norms). Increased WMH burden in certain areas of the brain predicted social cognition deficits in VCI and PD, and increased NPS in FTD and ALS. The findings from our study suggest that ischemic damage contributes to impaired social cognition, deficits in empathy, and worse NPS in neurodegenerative diseases, particularly FTD, but also PD, VCI, and ALS. Our findings suggest that cerebrovascular disease may contribute to NPS and social cognition deficits and warrants further study.

Activity trackers are unreliable for postoperative sleep monitoring in neurocognitive disorders

Manan Ahuja ¹, Shailee Siddhpuria ², Jessica Gormley ¹, Christina Reppas ², Eric Wong ³, Justin Lee ², Christopher Patterson ²

¹ *Michael G. DeGroote School of Medicine*

² *McMaster University*

³ *University of Toronto*

Background/Objectives: Wearable technologies that track activity and sleep use an algorithm of wrist movement detection and heart rate monitoring to recognize sleep initiation and to detect periods of wakefulness. The reliability of wrist sleep trackers in patients with neurodegenerative conditions such as dementia is unclear. We sought to investigate the consistency of activity monitor data from study participants with mild cognitive impairment (MCI), dementia, parkinson's disease and delirium in a sub-study of an ongoing investigation of sleep quality in older adults during their post-operative recovery from hip fracture.

Methods: Fitbit® wrist activity monitors were applied to consenting post-operative older adults with hip fractures and worn for up to 14 days while in hospital. We conducted an exploratory analysis of the device data from participants with MCI, dementia, parkinson's disease and those who developed postoperative delirium. The proportion of sleep data that failed to be recorded from participants with these conditions was compared to data from other participants in the study. If the Fitbit® monitor did not track any sleep for one or more nights, we categorized that as data that the device failed to record.

Results: Forty-seven patients (mean age 82, 64% female) had complete data collected at the time of this analysis. Twelve

patients (26%) had a diagnosed neurocognitive condition at baseline or developed postoperative delirium during their hospitalization. Of these, four participants had dementia at baseline and four had MCI or other neurocognitive disorders. Delirium developed in six out of twelve (50%) patients during their hospital stay. In the group with neurocognitive conditions, the activity monitors failed to record 52% (47 of 90 nights) of potential sleep data compared to 18% (42 of 229 nights) in the group without neurocognitive disorders.

Conclusion: Sleep data tracking using wrist monitors in our study of hospitalized older adults was inconsistent in participants with neurocognitive disorders. Possible reasons for the discrepancy include agitation, tremors, excessive movements (e.g. REM sleep disorder, hyperactive delirium) or device removal. It is also possible that the devices measured sleep accurately and that participants were awake all night. This highlights the potential challenges of using devices that have been validated for healthy adults and applying them to older adults with cognitive impairment. Alternative methods may be required to reliably and accurately evaluate sleep in future research investigations involving this patient population.

Canadian Indigenous Cognitive Assessment (CICA): Inter-rater reliability and criterion validity using a clinical sample

*Jennifer Walker*¹, *Wayne Warry*², *Melissa Blind*², *Christopher Patterson*³, *Cheryl Allaby*³, *Karen Pitawanakwat*⁴, *Yantao Zhao*¹, *Andrine Lemieux*², *Kristen Jacklin*², *Megan E O'Connell*⁵

¹ *School of Rural and Northern Health, Laurentian University*

² *University of Minnesota Medical School Duluth, Memory Keepers Medical Discovery Team*

³ *Department of Medicine, McMaster University*

⁴ *Nahndawehtchigeh Gamig Wiikwemkoong Health Center*

⁵ *Department of Psychology, University of Saskatchewan*

Background/Objectives: Dementia is a growing concern for Indigenous people worldwide. Age and other factors including high rates of multiple, complex health conditions at a younger age of onset and a combination of social, historical and colonial factors have led to projections of increased dementia in First Nations populations. Yet early detection of dementia in Indigenous populations remains challenging as current cognitive assessment tools are shown to be less reliable when used in these populations. The need for culturally appropriate clinical measures for dementia was identified by Indigenous community members and health care providers in Ontario, Saskatchewan and Alberta as a priority.

Methods: The Canadian Indigenous Cognitive Assessment (CICA) tool is a culturally-informed cognitive assessment tool that was adapted by Anishinaabe First Nations communities

on Manitoulin Island, Ontario. The CICA was validated over a period of several years using a multi-phase approach that included adaptation, translation, piloting, reliability and validity testing. The CICA was successfully validated in summer 2018 and takes approximately 15 minutes to complete, assesses 11 domains of cognition and provides a final score out of a possible 39 points. This study reports the inter-rater reliability and criterion validity of the newly developed CICA.

Results: The CICA demonstrated strong reliability (ICC = 0.95 (0.85,0.98)) and validity. The ideal cut-point to identify likely cases of dementia was a score of less than or equal to 34, for which the sensitivity was 100%, specificity was 85%, likelihood ratio plus (LR+) was 6.5 and the AUC was 0.98 (95%CI: 0.94 to 1.00). The results indicated a range of domain discriminability (Partial R-square range =0.04 - 0.57). Two cognitive domains alone accounted for 71% of the variance in dementia status.

Conclusion: The CICA is the first tool of its kind in Canada. The successful validation of the CICA tool on Manitoulin Island marks a significant step forward in the broader effort to provide culturally-safe health care services for Indigenous populations. The implications of the CICA for improved detection of cognitive impairment and dementia among Indigenous populations, culturally-safe pathways to formal healthcare, dementia surveillance, resource allocation and policy and planning are substantial.

The validation of the Canadian Indigenous Cognitive Assessment (CICA) tool in three Canadian provinces

*Lindsay Crowshoe*¹, *Kristen Jacklin*², *Gail Boehme*³, *Betty McKenna*⁴, *Wayne Warry*⁵, *Melissa Blind*⁵, *Karen Pitawanakwat*⁶, *Elaine Boyling*¹, *Sharlene Webkamigad*⁷, *Louise Bigeagle*⁴, *Jennifer Walker*⁷, *David Hogan*⁸, *Megan E O'Connell*⁹, *Nicole Akan*⁴

¹ *Department of Family Medicine, University of Calgary*

² *Memory Keepers Medical Discovery Team, University of Minnesota Medical School Duluth*

³ *File Hills Qu'Appelle Tribal Council*

⁴ *Morning Star Lodge, University of Saskatchewan*

⁵ *Memory Keepers Medical Discovery Team, University of Minnesota Medical School Duluth*

⁶ *Nahndawehtchigeh Gamig Wiikwemikong Health Center*

⁷ *School of Rural and Northern Health, Laurentian University*

⁸ *Department of Medicine, University of Calgary*

⁹ *Department of Psychology, University of Saskatchewan*

Background/Objectives: Our collective understanding of dementia in Indigenous populations has improved; however, improving our ability to accurately and safely identify dementia in Indigenous people remains a priority for individuals, families and health care providers. Accurate and

effective dementia case-finding tools are required to ensure that appropriate supports are available and put in place for families and individuals with dementia. Standard, widespread, existing cognitive assessment tools have been shown to be less reliable in identifying dementia in Indigenous contexts. In response, an international and multidisciplinary team of researchers, clinicians and Indigenous community partners collaboratively developed the Canadian Indigenous Cognitive Assessment (CICA) tool.

Methods: The CICA is a culturally-informed adaptation of the validated Kimberley Indigenous Cognitive Assessment (KICA), a tool designed specifically to address the gap in the availability of culturally appropriate assessment of older Indigenous people residing in Western Australia. Using a five-phased approach, the CICA will be adapted, translated, piloted and undergo reliability and validity testing in partnership with Indigenous communities in Ontario and Saskatchewan and also in the urban context of Calgary, Alberta.

Results: The CICA has been successfully adapted in Anishinaabe communities on Manitoulin Island and demonstrates strong inter-rater reliability and criterion validity. The work to validate the CICA for diverse Indigenous populations continues in 11 communities in File Hills Qu'Appelle Tribal Council, SK and in an urban setting in Calgary, AB.

Conclusion: The critical gaps in available culturally-informed care are made urgent by the compounding high rates of multiple chronic conditions experienced at younger ages and projected increased rates of dementia in Indigenous populations. The CICA is the first valid, reliable, and culturally appropriate cognitive assessment tool for Indigenous people in Canada. Implementing the widespread use of the CICA will contribute to improved detection of cognitive impairment and dementia among Indigenous populations, culturally-safe pathways to formal healthcare, dementia surveillance, resource allocation and policy and planning.

General health status remains important to dementia expression, even in the face of LATE neuropathologic changes.

Lindsay Wallace¹, Olga Theou¹, David Bennett², Sultan Darvesh¹, Susan Kirkland¹, John Fisk¹, Melissa Andrew¹, Kenneth Rockwood¹

¹ Dalhousie University

² Rush University

Background/Objectives: Limbic-predominant Age-related TDP-43 Encephalopathy (LATE) is a recently described entity associated with an amnesic dementia syndrome. LATE neuropathological changes (LATE-NC) have been reported in more than half of individuals in some autopsy series studies. Previous work has demonstrated that frailty modifies the

effect of neuropathology in dementia expression. Here, we extended these analyses to investigate whether the relationship between LATE-NC and dementia is modified by frailty.

Methods: This was a cross-sectional analysis of data from the Rush Memory and Aging Project, a clinico-pathological study of older adults, most of whom live in a retirement community in the USA. Participants were followed with annual clinical and neuropsychological evaluations and at time of death all had an autopsy. TDP-43 immunohistochemistry was performed on the amygdala, hippocampus, midfrontal, midtemporal, and entorhinal cortices using a rat phosphorylated monoclonal TAR5P-1D3 TDP-43 antibody. LATE-NC was quantified by TDP-43 pathology staging. Stage 1 indicated pathology limited to the amygdala, stage 2 indicated pathology had spread to the limbic cortex including the hippocampus, and stage 3 indicated significant spread of pathology to the neocortex. Frailty was operationalized using the deficit accumulation approach, with a frailty index constructed from 41 health variables including function, comorbidities, symptoms, and signs; the frailty index was binned in increments of 0.1 for regression analysis. Dementia status was determined by clinical

Results: A total of 601 older adults (89.86.1 years at death, 68.4% female) were eligible for inclusion. At time of death, 27.0% were determined to have had MCI, and 39.3% to have had dementia. Frailty index scores ranged from 0.04-0.91, with a mean of 0.420.17. LATE-NC was seen in 56.7% of the sample: 20.8% with stage 1, 21.0% with stage 2, and 15.0% with stage 3. Frailty did not differ across LATE-NC stages. At all LATE-NC stages, frailty index scores were significantly higher among both MCI and dementia groups, compared with no cognitive impairment and in the dementia group compared to MCI. Ordinal regression analyses demonstrated that frailty and LATE-NC were independently associated with dementia status ($\beta=0.27$, $p<0.001$ for each 0.1 frailty index increment; $\beta=0.27$, $p<0.001$, for each LATE-NC stage); their interaction was non-significant.

Conclusion: Conclusions: Our results suggest that LATE-NC and frailty are independent processes that each contribute to dementia expression. Each 0.1 increase in frailty index and each stage increase in LATE-NC corresponded to a 27% increase in odds of dementia status transition (i.e. from no cognitive impairment to MCI, or MCI to dementia). These analyses provide important context for understanding the magnitude of the contribution of this new conceptualization of TDP-43 neuropathology to clinical dementia expression. Further, these results suggest that age-related deficit accumulation is important to the clinical expression of dementia, even when neuropathology is known.

Dual-task gait assessment may predict future cognitive decline in a memory clinic setting: a longitudinal study.

Stephanie Cullen ¹, Michael Borrie ², Susan Carroll ², Joel Mahon ¹, Yanina Sarquis-Adamson ¹, Manuel Montero-Odasso ¹

¹ Gait and Brain Lab, Lawson Health Research Institute, Western University

² Division of Geriatric Medicine, Schulich School of Medicine and Dentistry, Western University

Background/Objectives: Dual-task gait testing (walking and simultaneously performing a cognitively demanding task) has been recently investigated as a measure of cognitive-motor interface in older adults. The dual-task gait cost (DTC) is the magnitude of gait slowing due to complexity of the added cognitive task, expressed as a percent of usual gait speed. Recently, dual-task gait velocity and DTC have been shown to predict progression to dementia in patients with mild cognitive impairment (MCI). The purpose of this study was to determine if poor performance on dual-task gait testing is predictive of future cognitive decline in a memory clinic setting.

Methods: Patients from the Aging Brain and Memory Clinic in London, Ontario, were included in this study if they were at least 50 years old and able to ambulate six meters without assistance. Patients had to have been seen for a baseline visit in the clinic and a follow-up assessment (minimum six months later). Patients performed two dual-task tests: counting backwards by ones and naming animals. DTC for each test was calculated as: $([\text{usual gait velocity} - \text{dual-task gait velocity}] / \text{usual gait velocity}) \times 100$. Cognitive decline was classified as having significant decline on cognitive tests and by clinical consensus at the follow-up visit. Cox proportional hazard models were used to evaluate the association between high DTC (>20%) at baseline and cognitive decline at follow-up.

Results: 47 patients (mean age=71.2 years [SD=10.1]; 51.5% female) were included in analyses with baseline diagnosis of subjective cognitive impairment (SCI; n=4), MCI (n=26), or mild dementia (n=17). 30 of these patients showed evidence of cognitive decline at the follow-up visit (mean=17.5 months later [SD=7.0]). Hazard models showed that patients with a DTC higher than 20% on the counting backwards task were at higher risk for future cognitive decline (hazard ratio [HR] =1.34, 95% CI 0.52-3.45, p=0.54). Similarly, high DTC (>20%) on the naming animals task posed the highest risk for future cognitive decline (HR=2.92, 95% CI 0.94-9.09, p=0.06). Due to the limited sample, these results did not reach statistical significance.

Conclusion: Our results show that poor performance on dual-task gait testing, indicated by a high DTC, may be a predictor of future cognitive decline. Dual-task gait testing may therefore be useful in identifying patients at high risk for cognitive decline in a clinical setting. Small sample size likely limited statistical significance and future analyses are warranted after more patients have returned for follow-up.

Validation of Kimberley Indigenous Cognitive Assessment tool for the diverse population of Nepal

Nabina Sharma ¹, Jennifer Walker ²

¹ School of Rural and Northern Health, Laurentian University

² Canada Research Chair (Tier II) in Indigenous Health, Assistant Professor, School of Rural and Northern Health, Laurentian University

Background/Objectives: The rate of increase in people with dementia is predicted to be three to four times higher in developing countries than in the developed region. By 2010, 71% of all people with dementia will be living in developing countries. In Nepal, there is estimated to be 13,5000 people living with dementia which will double in 20 years. The standard cognitive assessment tools help in the assessment and recognition of dementia in resource constraint region. However, most of the cognitive assessment tools have been developed in Western- English-speaking countries which shows language, cultural and education bias in a different setting.

Methods: The Kimberley Indigenous Cognitive Assessment (KICA) was developed in the Kimberley region of Australia as a culturally appropriate tool for the Indigenous population. This tool will be adapted and validated in the diverse population of Nepal. The quantitative community based participatory action research will be carried out in partnership with the community advisory group in the urban region of Kathmandu. The community advisory group will comprise a neurologist, psychologist, geriatrician, nurses, community people, and language experts. Adaptation of the tool will be done in consultation with the community advisory group, and Nepali and English versions of the tool will be developed. The adapted KICA will be piloted, reliability tested and validated with different sample size in people aged 45 years and above from different ethnic communities. An equal number of male and female with different cognition level identified by health worker will be recruited.

Results: The results obtained from assessing cognitive level using the adapted KICA will be compared with the Geriatric Assessment as a gold standard diagnosis of dementia. The most appropriate cut-off for an adapted KICA score that best indicates the presence of clinical dementia will be explored. Sensitivity and specificity values and cut-off scores will be explored using the receiver operating characteristic (ROC) curves. The overall utility of the adapted KICA will be calculated using receiver operating characteristic (ROC) curves. Cohen's Kappa and the Intra Class Coefficient will calculate the inter-rater reliability of each item.

Conclusion: The adapted KICA will be the first valid, reliable, and culturally adapted tool without language and education bias for assessing dementia in the Nepalese context. This

research will have an implication for informing resource allocation, policy and planning dementia care services in Nepal. Furthermore, this tool will eventually emerge as a case-finding tool for dementia and conducting an epidemiological study in shaping the future health policy on dementia in Nepal.

Relationship between caregiving burdens and clinical characteristics in the Ontario Neurodegenerative Disease Research Initiative (ONDRI)

Derek Beaton ¹, Angela Roberts ², Doug Munoz ³, Richard Swartz ⁴, David Breen ⁵, Anthony Lang ⁶, Sandra E. Black ⁷, Michael Borrie ⁸, Corrine Fischer ⁹, Corrine Fischer ¹⁰, Sanjeeve Kumar ¹¹, Morris Freedman ¹², Dallas Seitz ³, Andrew Frank ¹³, Elizabeth Finger ¹⁴, Lorne Zinman ⁷, David A. Grimes ¹⁵, Mario Masellis ⁷, Kelly M. Sunderland ¹², Brian Tan ¹², Malcolm A. Binns ¹², Stephen C. Strother ¹², Jennifer Mandzia ¹⁶, JB Orange ⁸, Carmela Tartaglia ⁶, Paula McLaughlin ³, Donna Kwan ³

¹ Rotman Research Institute, Baycrest Health Sciences

² Northwestern University

³ Queen's University

⁴ Sunnybrook Health Sciences

⁵ University of Edinburgh

⁶ University Health Network

⁷ Sunnybrook Health Sciences Centre

⁸ Western University

⁹ St. Michael

¹⁰ St. Michael's Hospital

¹¹ Centre for Addiction and Mental Health

¹² Baycrest Health Sciences

¹³ Elisabeth Bruyere Hospital

¹⁴ Western University, Parkwood Institute, London

¹⁵ The Ottawa Hospital

¹⁶ London Health Sciences Centre

Background/Objectives: Many persons living with neurodegenerative disorders are often cared for by informal caregivers (e.g., family, friends). Informal caregivers experience various types of stress and strain. Few studies have attempted to parse the multidimensional aspects of caregiving burdens across neurodegenerative disorders. We need to understand the different ways informal caregivers experience caregiving burdens. The Ontario Neurodegenerative Disease Research Initiative (ONDRI) is well positioned to uncover types of caregiving burdens across neurodegenerative disorders. In our study we identified (1) various caregiving burdens and (2) relationships between caregiving burdens and demographic, cognitive, and clinical characteristics of participants and study partners.

Methods: We used the Zarit Burden Inventory, with 504 partner-participant dyads across five neurodegenerative disorders: vascular cognitive impairment, Parkinson's disease, Alzheimer's disease/amnestic mild cognitive impairment, frontotemporal dementia (FTD), and amyotrophic lateral

sclerosis (ALS). Participants were administered the Montreal Cognitive Assessment (MoCA), and study partners provided information about the participant for the Neuropsychiatric Inventory and Activities of Daily Living (ADLs). Responses on the Zarit's were ordinal thus we applied multiple correspondence analysis with split-half resampling, which revealed five reproducible components of caregiving burdens.

Results: Component 1 showed overall burden with modest group effects of FTD and ALS and moderate to strong correlations with MoCA subscales, neuropsychiatric symptoms and ADLs. Component 2 revealed concerns about care with modest contributions by the ALS group and both ages (study partner and participant). The remaining components showed no group effects. Component 3 was driven by social & financial concerns vs. dependency and correlated with MoCA subscales, iADLs, and participant age. Component 4 dissociated social and financial burdens and primarily associated with neuropsychiatric symptoms and ADLs. Component 5 dissociated well-being vs. social and financial burdens, and was modestly correlated with household income.

Conclusion: The breadth of the ONDRI study provided a valuable perspective to understand contributions to caregiving burden across neurodegenerative disorders. Resource allocation and policy initiatives could be driven by these types (components) of, and contributions to, caregiving burden. Our results reveal the potential for general and disease-specific caregiver education and training programs, as well as the other initiatives for overall health and well-being of patients and caregivers; initiatives that will become crucial with the increase in both persons living with neurodegenerative disorders and the associated costs.

Ethynyl-Biphenyl Derivatives as Amyloid-Beta Aggregation Inhibitors

Amna El Shatshat, Praveen P.N. Rao
University of Waterloo

Background/Objectives: Alzheimer's disease (AD) is a progressive and neurodegenerative disorder, with characteristic symptoms such as memory loss and cognitive decline. AD is characterized by the formation of dense amyloid β (A β) plaques and neurofibrillary tangles (NFTs) in the central nervous system (CNS), and subsequent decline in cognitive function. The amyloid β cascade hypothesis has been put forth, wherein an increase in insoluble amyloid β aggregates initiate the neurodegenerative cascade observed in AD. The objective of this project is to design, synthesize and evaluate novel ring scaffolds that can prevent the aggregation of A β 1-40/42 aggregation, by utilizing the medicinal chemistry principles.

Methods: In this regard, the structure-activity relationship (SAR) data for a library of 15 small molecules based on

ethynyl-biphenyl system was obtained. Molecular modeling was utilized to investigate their binding modes within the Aβ_{1-40/42} model and, the chemical library was screened by conducting anti-Aβ_{1-40/42} aggregation experiments by fluorescence spectroscopy and transmission electron microscopy (TEM) experiments to identify lead candidates.

Results: Our investigations demonstrate that all the 15 small molecules based on ethynyl-biphenyl systems tested exhibit anti-aggregation properties by preventing both Aβ₄₀ and Aβ₄₂ fibrillogenesis (ranging from (□35% to 80 % inhibition at 25 μM). Molecular docking studies conducted, using the dimer models of Aβ₄₀ peptide, suggest that these ethynyl-biphenyl systems interact in the aggregation prone Phe19-Ala21 and the β-turn region (Asp23-Lys28) whereas a similar study with Aβ₄₂ dimer and oligomer models, indicate that the ethynyl-biphenyl systems were oriented in a hydrophobic region (Gln15, Leu16, Leu17 and Leu34).

Conclusion: These results, suggest that small molecules based on ethynyl-biphenyl systems are capable of directly interacting with both Aβ₄₀ and Aβ₄₂ peptides. These studies will have implications in developing potential therapeutics for Alzheimer's disease.

Pharmacogenomics services for Ontarians living with dementia: an environmental scan

Julia Teves¹, R Jack Bodkin², Joanne M-W Ho³

¹ School of Pharmacy, University of Waterloo

² Department of Medicine, McMaster University, Grand River Hospital

³ Department of Medicine, McMaster University, Schlegel Reserach Institute for Aging

Background/Objectives: Dementia is a common progressive neurocognitive disease associated with disability, death and high societal and health care costs. The response to pharmacologic therapy varies between individuals. Pharmacogenomics is increasingly marketed as a tool for personalized prescribing and to decrease adverse drug events. However, its current practical utility for real world patients with dementia is unknown. We sought to understand the landscape of available pharmacogenomics services and the implications for patients considering acetylcholinesterase inhibitor therapy.

Methods: We conducted an environmental scan by searching online for companies providing pharmacogenomic testing to patients in Ontario, Canada starting May 29, 2019 to June 6, 2019. We included all for-profit and not-for-profit companies; testing available solely through academic health centers was not included in this review due to its selective availability to the public. We reviewed each company's website and contacted them (through email or telephone) for information regarding their referral process, sample collection and

storage, data storage and privacy policies, cost, final pharmacogenomics report content, and end user marketing strategy. We identified genotypes relevant to the pharmacodynamics or pharmacokinetics of acetylcholinesterase inhibitors available and we assessed the evidence supporting their clinical relevance using a grading system.

Results: The online search yielded seven companies that met the inclusion criteria. The mean cost for pharmacogenomics testing was \$439 (Standard Deviation +/- \$112). While most of the companies (n=5) stated they may be covered under patient's private insurance or health savings accounts, none were publically funded by Ontario's provincial health insurance. Most companies (n=5) operated labs and data servers either in Ontario or Quebec while two services processed their DNA samples outside of Canada. Two pharmacogenomics companies provided de-identified data to insurance companies which covered the cost of the test. Of the 12 genes with potential to influence acetylcholinesterase inhibitor efficacy and safety, five were graded: butyrylcholinesterase, cholinergic receptor nicotinic alpha 7 subunit, choline O-acetyltransferase, acetylcholinesterase and cytochrome P450 family 2 subfamily D member 6 (CYP 2D6). All seven companies tested for CYP2D6 metabolizer status, however none of the other genes with graded evidence are specifically tested by the included companies.

Conclusion: An increasing number of for-profit commercial companies are offering pharmacogenomics testing. At this time the benefit of testing a patient's pharmacogenomics status in the context of acetylcholinesterase inhibitor use is unclear for both the patient and the prescriber.

Developing prognostic models for predicting short-term falls in older adults with dementia using a vision-based gait monitoring system

Sina Mehdizadeh¹, Elham Dolatabadi², Kimberley-Dale Ng¹, Twinkle Arora¹, Melody Jizmejian¹, Avril Mansfield¹, Alastair Flint³, Babak Taati¹, Andrea Iaboni¹

¹ Toronto Rehabilitation Institute

² Vector Institute for Artificial Intelligence

³ Department of Psychiatry, University of Toronto

Background/Objectives: Falls during walking are a major cause of injury, and mortality in older adults with dementia. Their annual incidence of falls is twice the incidence of falls in cognitively intact older people. Therefore estimating the probability of falls based on factors that contribute to fall is important. Our aim was to examine the ability of three separate prognostic models comprising a clinical measure of balance (Performance Oriented Mobility Assessment-POMA-B), and quantitative assessment of gait speed and stability, in predicting the probability of falls in the next 5 days or the next month in older adults with dementia.

Methods: A vision-based system (called AMBIENT) comprised of a Kinect camera was used to record natural gait of participants on a Specialized Dementia Unit. The 3D joint motions during walks captured by the Kinect. Gait speed was calculated as the displacement of the sacrum along the anterior-posterior direction divided by the elapsed time. Gait stability was estimated using the margin of stability (eMOS) in medio-lateral direction and calculated as the minimum distance between estimated extrapolated centre of mass to the ankle in medio-lateral direction. Gait speed and stability were averaged over a two-week baseline period. Clinical (POMA-B) and demographic measures were collected, and falls were tracked throughout the participants' admission. Survival analysis was performed by employing Cox proportional hazard models to predict time to first fall. Models' discriminative and predictive ability at 5 and 30 days were examined using Harrel's c-index, specificity, sensitivity, and area under the receiver operating curve (AUC).

Results: Fifty-two participants with dementia took part in this study. 28 (53.8%) of participants fell within a mean observation period of 50 ± 26 days, with a mean time to first fall of 23 ± 26 days. The age- and sex-adjusted prognostic models for POMA-B and eMOS models had c-index scores of 0.75, and in contrast to gait speed, were statistically significant predictors of time to fall. The eMOS model predicted risk scores were closer to observed values. Overall, the POMA-B and eMOS models' sensitivity (0.67) and specificity (0.70) were higher than the gait speed (sensitivity=0.64, specificity=0.66) model with gait stability model having better discrimination at 30 days. The AUC of the gait stability model was 0.92 and 0.74 at 5 and 30 days, compared to 0.83 and 0.63 for gait speed and 0.80 and 0.68 for POMA.

Conclusion: Clinical and quantitative measures of gait stability are better short-term predictors of falls in people with dementia compared to gait speed, with a vision-based estimate of gait stability showing the highest predictive performance. Gait stability can be assessed using a vision-based gait monitoring system and is a good predictor of an imminent fall.

Investigation of the Positron-Emission Tomography [18F] MK-6240 Tau Ligand in Genetic Frontotemporal Dementia

Jake Levy¹, Melissa Savard², Tharick Pascoal², Elizabeth Finger³, Jean-Paul Soucy⁴, Pedro Rosa-Neto⁵, Simon Ducharme¹

¹ McConnell Brain Imaging Centre, Montreal Neurological Institute, McGill University

² Translational Neuroimaging Laboratory, The McGill University Research Centre for Studies in Aging

³ Department of Clinical Neurological Sciences, Schulich School of Medicine and Dentistry, Parkwood Institute, Lawson Health Research Institute, University of Western Ontario

⁴ Montreal Neurological Institute, McGill University

⁵ Translational Neuroimaging Laboratory, The McGill University Research Centre for Studies in Aging

Background/Objectives: Tau is one of several proteins which can pathologically aggregate and cause frontotemporal dementia (FTD). While knowing which protein is causing a patient's disease is crucial - particularly for recruiting patients for trials of anti-tau drugs and tracking their progression - no biomarker currently exists for identifying the pathogenic protein in vivo. The objective of this project is to investigate the potential for the MK-6240 PET tracer to bind to tau in FTD. Importantly, recent studies have suggested that MK-6240 binds effectively to tau in Alzheimer's disease (AD), but results have been negative thus far outside of AD.

Methods: We are currently enrolling subjects with genetic FTD, who constitute an ideal population for testing because their pathology is already known. Each participant recruited so far was submitted to tau-PET scanning with MK-6240, amyloid-PET imaging with NAV-4694 to rule out confounding AD pathology, high-resolution structural MRI, and a full battery of neuropsychological tests. We are scanning patients with MAPT mutations (which cause accumulation of tau leading to FTD; therefore these patients are expected to show tau binding) as well as patients with FTD due to mutations such as C9orf72, GRN, and VCP (which cause accumulation of TDP-43; thus these patients act as disease controls without tau and are expected to not show abnormal MK-6240 binding). Images were processed using a previously validated pipeline; MK-6240 standard uptake value ratios from 90-110 minutes were calculated for both anatomical regions of interest and voxel-by-voxel maps using cerebellum gray matter as a reference region.

Results: We have at this point obtained results from six patients. Of note, before the conference we will have results from several more patients, including at least one additional symptomatic MAPT mutation. We have scanned two symptomatic MAPT patients, whose tau-PET scans both demonstrated binding in expected regions (eg. orbitofrontal cortex, temporal lobes, basal ganglia, etc.) without significant off-target binding. We also analysed two asymptomatic MAPT carriers: one, estimated to be five years from disease onset, showed MK-6240 binding especially in anterior frontal and medial temporal lobes; the other was approximately 30 years from disease onset and did not demonstrate any binding. We additionally scanned two individuals with symptomatic FTD caused by a non-tau mutation (one C9orf72; one VCP): their scans both did not reveal any MK-6240 binding, suggesting their disease is caused by something other than tau. All eight amyloid-PET scans were negative.

Conclusion: Our findings of MK-6240 binding specifically in regions known to be implicated in FTD in two symptomatic MAPT patients and one asymptomatic MAPT carrier within

five years of disease onset are promising, particularly when combined with the absence of binding in our participants with C9orf72 and VCP mutations (who are both not expected to have tau). Although preliminary, these results are encouraging for eventually developing a test for detecting tau in vivo in FTD. Further patient recruitment is ongoing to determine clinical applicability.

DataDay: Self-management app for people with MCI or dementia

Arlene Astell¹, Felicia Martins¹, Shannon Waller², Parminder Flora³, Chris Morland⁴, Steve Donovan⁵

¹ University Health Network

² Primary Care Memory Clinics (Oshawa, ON)

³ Ontario Shores Centre for Mental Health Sciences

⁴ Citrus Suite

⁵ Citrus Suite (Liverpool, UK)

Background/Objectives: Self-management is an important approach to empowering individuals with chronic conditions to live as well as possible. DataDay is a self-management app co-created with people living with Mild Cognitive Impairment (MCI) or early dementia and is accompanied by a similarly co-created clinician portal. DataDay comprises four modules (cognition, mood, physical activity, and nutrition) that people are invited to use every day. Feasibility and usefulness have been undergoing testing in Durham Region of Ontario through the Primary Care Collaborative Memory Services (PCCMS). The aim is to examine the impact of self-management through daily tracking on health service utilization.

Methods: Twelve people with MCI or early dementia diagnosed through Durham Region Primary Care Memory Clinics have been offered the opportunity to test out DataDay at home, with ten participants continuing to test it for a minimum of 6 months. Of those ten participants, eight were female, the mean age was 76, eight had owned a smartphone and five had owned a tablet at the time of consent. Participants complete each module once a day and can view their progress through the app on a handheld device. Five PCCMS staff also participated. They were all female with a mean age of 35, and their roles included Occupational Therapists, Registered Nurses, and Social Workers. Daily data are uploaded into cloud storage and can be reviewed by the individuals themselves as well as any of five participating members of the PCCMS they grant access to. The PCCMS team can track their client's progress

Results: Data collection of Phase 1 is just completed with the majority of participants recording entries into the app for over 50% of the days they had access to it, with some up to 80%. Analysis of the data is currently underway and includes analysis of the participants' health service utilization prior to and during their use of the app, and comparing these rates of utilization to summative rates reported by the Central

East LHIN for the previous 5 years. The patterns of mood, cognitive function, physical activity and dietary reporting over time. The majority of people with MCI or dementia using DataDay find the ability to track their progress helpful, and the knowledge that Memory Clinic team members can remotely do the same reassuring. Some people have found the nutrition module time-consuming to complete but overall the feedback is positive and provides support for encouraging self-management for people with

Conclusion: The majority of people with MCI or dementia using DataDay find the ability to track their progress helpful, and the knowledge that PCCMS team members can remotely do the same is reassuring. Some participants have found the nutrition module time-consuming to complete but overall the feedback is positive and provides support for encouraging self-management for people with MCI and dementia. Feedback from PCCMS staff is similarly positive, with them highlighting the benefits of being able to spot changes in functioning and seeing if this persists or just represents "a bad day".

Mixed Reality Technologies to support people with dementia: a human centred study

Arlene Astell¹, Deborah Fels², Shital Desai³

¹ University Health Network

² Ryerson University

³ York University

Background/Objectives: Mixed Reality technologies (MRTs) including Augmented Virtuality and Augmented Reality - could offer functional support to people with dementia to continue doing their everyday activities. 'Presence' is an experience with technologically mediated perceptions that generates a feeling of being there and the illusion of non-mediation. The cognitive impairment experienced by people with dementia adds a layer of complexity to our understanding of presence in relation to mediated real and virtual environments. This study examines what constitutes an experience of presence for people with dementia when they interact with Mixed Reality technologies.

Methods: Nine people with dementia (MoCA = 13 to 25, mean MoCA = 21, Age = 63 to 90 years mean age = 79) were observed playing games on two MRTs: Osmo and HoloLens. The participants played Tangram on Osmo and Young Conker on HoloLens. The study was conducted in participant homes and at Memory and Company, a memory health club for seniors with dementia. The game play was video recorded for analysis. The data were analysed to identify elements of participant interactions with the two technologies (Osmo and HoloLens) that promote an experience of presence. The interactions of the participants in the virtual space, the physical space, and their attention crossover between the two spaces were coded in Noldus Observer XT 14.1 to identify themes

representative of participant experiencing a feeling of being part of the real world with mediated elements around them.

Results: The study found that affordances, perceptual elements (in both physical and virtual environments), a degree of realism and the social aspect are crucial to the experience of being present for people with dementia. People with dementia mostly used physical affordances to determine actions to be performed in the two environments. The effect of sound was found to be the most immersive element to contribute to the degree of realism. It was more effective in grabbing the participant's attention than either visual prompts or animated images. However, clarity of sound was very important for correct understanding of the prompts.

Conclusion: This study confirmed that people living with dementia can experience presence when using MRTs and this is most tangible with physical affordances. These findings support the potential of MRTs to be further developed to provide scalable solutions that are affordable, adaptable and that can be easily adopted and deployed.

Dementia or Mild Cognitive Impairment in the workplace: exploring the role of technology

Arlene Astell¹, Jennifer Boger², Parminder Flora³, Karan Shashtri², Deanna Persaud⁴, Sheida Marashi², Ann-Charlotte Nedlund⁵, Anna Mäki-Petäjä-Leinonen⁶, Louise Nygård⁷, Mervi Issakainen⁶, Charlotta ryd⁷

¹ University Health Network

² University of Waterloo

³ Ontario Shores Centre for Mental Health Sciences

⁴ Ontario Technology University

⁵ Linköping University

⁶ University of Eastern Finland

⁷ Karolinska Institutet

Background/Objectives: Individuals receiving a diagnosis of Mild Cognitive Impairment (MCI) or dementia whilst still in the workforce face multiple challenges that have relatively under-explored. The international MCI@work project is examining the situation of adults living and working with MCI or dementia to identify their needs across a range of domains, including technological barrier and facilitators, legal rights and responsibilities and individuals' needs and preferences. Here we report our findings in relation to the use of technology to support continued participation in the workforce.

Methods: Interviews were conducted with six individuals with MCI or early dementia plus one personal supporter in Ontario, Canada. Of the six participants with MCI or dementia aged between 46-65 (mean 55) years of age, two were still working full-time, three were on medical leave and one was retired. The interviews lasting between 60 and 180 minutes were recorded, transcribed and examined using Thematic Analysis.

Results: The participants reported using 19 different technologies to support them at work plus six additional technology-based tools. They discussed the function of the tools in their workplace as well as the challenges they experienced. The participants also made suggestions for future technological developments to support their continued participation at work.

Conclusion: Younger adults living with MCI or dementia incorporate a wide variety of technologies into their daily routine to support their continued participation. However, technology-related challenges linked to either progressive cognitive impairment or use of the technologies themselves, present obstacles to continued occupation. The findings are being used to inform development of a technology-based support for people with MCI or dementia in the workforce in addition to informing the wider experience of this population.

Chinese-Speaking People Living with Dementia Playing Touchscreen Games

Yuhan Pan¹, Phil Jodrell², Erica Dove³, Arlene Astell³

¹ Toronto Rehabilitation Institute, University Health Network

² University of Sheffield

³ Toronto Rehabilitation Institute, University Health Network

Background/Objectives: While approximately 3.25% of all Canadians speak the Chinese languages (e.g. Mandarin and Cantonese), few dementia interventions have focused on this population. We have previously demonstrated that tablet devices are accessible for people with dementia and they enjoy playing both familiar and novel unfamiliar games. This two-part study aims to examine how Chinese-speaking people with dementia learn to play tablet games over time, and whether cultural differences influence gameplay outcomes.

Methods: Familiar digital games are based on traditional Chinese games such as Mahjong. Unfamiliar digital games are ones participants have not seen or played before, such as Bubble Explode. Phase One: Chinese-speaking participants with dementia living in long-term care (n=6; mean MoCA =16.7 (range=5-24), mean age 71.8 (range 58-81) were recruited. Participants were assigned to play either familiar (Mahjong=4) or unfamiliar game (Bubble Explode=1; Fruit Matching =1) on a tablet, three times over a seven-day period. Phase Two: Chinese-speaking participants with dementia living in long-term care (n=5; mean MoCA =7.4 (range=2-14), mean age 87.5 (73-97) were recruited. Participants were asked to choose between two familiar (Mahjong and Chinese Cards) and two unfamiliar (Fruit Matching and Popping Stars) games. In both phases video recordings were collected and analyzed using ObserverTM behavioural coding software to look at learning and indicators of engagement.

Results: Phase One showed reduced game completion time by session 3, with high (>80%) or increased number of

successful screen touches during game play. Participant engagement measured through the average gameplay time spent looking at the screen were above 98% for all the games. In Phase Two, preference towards novel games (Fruit Matching: 28.57%, Popping Stars: 35.71%) were observed, as the familiar games were chosen less frequently (Mahjong: 21.42%, Chinese Cards: 14.29%).

Conclusion: The findings confirm that Chinese-speaking people living with dementia can learn to use tablets and play tablet games, while being highly engaged in gameplay. When offered a choice, they selected novel, digital games over familiar, traditional ones. As a result of the study being presented at the City of Toronto Long Term Care Homes and Services Youth Summit 2018, the city passed a proposal to implement tablets into their programming and are currently receiving training from the research team. These results may support other services to adopt or expand their technological repertoire for residents of Chinese heritage.

Digital Storytelling Experience Among People Living with Dementia

Yuhan Pan ¹, Hollis Owens ², Elly Park ³, Lili Liu ³, David Kaufman ², Arlene Astell ¹, Natalie Simonian ⁴

¹ Toronto Rehabilitation Institute, University Health Network

² Simon Fraser University

³ University of Alberta

⁴ University of Toronto

Background/Objectives: Digital storytelling is an active process for creating short narratives using relatively simple technology. It has been suggested that digital storytelling offers a legacy, contributes to a sense of identity, and is a method of self-expression, allowing individuals to be remembered in the way that they wish to be remembered. Building on this previous work, researchers collaborated with older adults living with dementia in British Columbia, Alberta and Ontario to examine the experience of directly involving them in the creation of their digital narratives. Some participants were in the earlier stages whilst others had lived with dementia for years.

Methods: Twenty participants were recruited to develop their digital stories: Vancouver: Six participants (2 females, 4 males) from retirement residences and Alzheimer's Society; Edmonton: Seven participants (3 females, 4 males) from the Alzheimer's Society; Toronto Site: Seven participants (4 females, 3 males) recruited from Alzheimer's Society York Region and Memory & Company. The storytelling methods varied slightly according to the needs and wishes of the participants. Over six to eight weeks, researchers met with participants individually to develop their stories and to input photos, voiceover, music and sound effects. In cases where

no personal photographs were available, researchers acquired freely available images from the Internet that illustrated the participant's narratives, for example street scenes or sports teams from a certain era. Each participant was invited to share their completed digital story with their care partners and families.

Results: It is possible to directly involve people living with dementia in creating their own digital stories. Videos ranging from 3 to 7 minutes covered personal accounts of war, family, travel, employment, hobbies and advocacy for the dementia community. Sharing the digital stories evoked joy and sadness, and shared reminiscing. Family members expressed that the digital format allowed them to share and connect with other family members and foster conversation with their loved ones. "I've never seen that before... I love going back to the beginning (of the video)." (participant quote). One family member expressed that the project came along at the right time when the participant was still able to recall and tell certain parts of their story, and those stories were preserved in the video.

Conclusion: People with dementia can participate in creating digital stories and enjoy the process. Some participants commented that the time and method used to create the digital stories made them realize that they could remember more about their past than they thought. The finished digital stories appeared to convey participants' stories in ways that enhanced connections between younger and older generations. The project provides insights into best practices for facilitating digital storytelling workshops for persons with dementia. We have produced a manual with detailed instructions for developing digital stories to assist organizations that are interested in offering this activity.

Behavioural biomarkers for processing speed deficits in a vascular cognitive impairment cohort

Ying Chen ¹, Kelly Sunderland ², Julia Fraser ³, Joel Ramirez ⁴, Donna Kwan ⁵, Paula McLaughlin ⁵, Manuel Montero-Odasso ⁶, Rick Swartz ⁴, Stephen Strother ², Doug Munoz ¹

¹ Queen's University, Ontario Neurodegenerative Disease Research Initiative (ONDRI)

² Rotman Research Institute Baycrest, Ontario Neurodegenerative Disease Research Initiative (ONDRI)

³ University of Waterloo

⁴ Sunnybrook Hospital, Ontario Neurodegenerative Disease Research Initiative (ONDRI)

⁵ Ontario Neurodegenerative Disease Research Initiative (ONDRI)

⁶ University of Western Ontario

Background/Objectives: Processing speed is a core cognitive process that can adversely impact executive functioning in vascular cognitive impairment (VCI). Deficits in speed of

processing are common to VCI. Different tasks have been used to measure speed of processing in VCI; however, reliable behavioural biomarkers for decline of processing speed have not yet been identified and validated. Our goal is to identify behavioral biomarkers of processing speed deficits in VCI by fusing measures from three different behavioural tasks, saccadic eye movements, gait, and neuropsychological tests, in a large sample of VCI participants (n=161) recruited into the Ontario Neurodegenerative Disease Research Initiative (ONDRI).

Methods: Participants performed two saccadic tasks: pro-saccade (looking directly toward a visual target), anti-saccade (voluntarily looking away from stimulus in the opposite direction) requiring cognitive control to suppress an automatic pro-saccade to the target. Saccade reaction time (SRT), variability of SRT, and anti-saccade direction errors were included in analysis. Participants performed three walking tasks, single-task (walking at their preferred speed), fast walking (walking as fast as they could), and dual task (walking while concurrently counting backward, or generating animal names) involving cognitive processes. Gait velocity plus dual cost were included in analysis. Among neuropsychological batteries, time to complete DKEFs color-word interference (Stroop naming colors, reading words, inhibition, and switch) and Trail-Making test (TMT-A & B) as well as the number of responses in DKEFs verbal fluency and Symbol Digit Modalities test (SDMT) were used in analysis. Effect of demographic and vascular risk factors was controlled in analysis.

Results: Individual principal component analysis on variables from each of the three tasks showed a separation of assessments for automatic vs. more cognitively demanded tasks. Then, multiple factor analysis was performed to investigate how and whether these measures from the multi-modality tasks are related. Our results showed that some saccade variables (e.g. variability of anti-saccade RT) grouped with most of neuropsychological variables, and some other saccade variables grouped with gait and neuropsychological variables (e.g., anti-saccade direction error rate, gait dual task cost, and times of Stroop inhibition and switch conditions).

Conclusion: The correlation of variables from the three different behavioural tasks suggests a fusing pattern of cross-task measures for speed of processing deficits in VCI, which could be used as indicators to tracking disease progression and developing early prevention.

Association between benzodiazepines and neurocognitive disorders : a study from the Canadian Health Survey matched with a provincial medical administrative database.

Diego Legrand¹, Pasquale Roberge², Alain Vanasse²,
Christian Bocti³

¹ University of Sherbrooke

² University of Sherbrooke, CHUS Research Centre

³ University of Sherbrooke, Research Centre on Aging

Background/Objectives: In Canada, and all over the world the prevalence of dementia will increase dramatically over the next few decades. This is a public health priority. A link between exposure to benzodiazepines and cognitive impairment has been suggested by several studies; if this association is confirmed, it could represent a potentially modifiable factor.

Methods: We conducted a systematic review, including all recent original studies (2009 - 2019) and all benzodiazepines molecules, to examine any possible association between benzodiazepines utilization and cognitive impairment, dementia, or Alzheimer's disease.

Results: Preliminary results indicate that there is an association between benzodiazepines exposure and presence of dementia or cognitive disorders. Benzodiazepines have anterograde amnesia among their documented side effects, which may explain an increased risk of neurocognitive disorders during use. However, a major limitation of most of these studies is reverse causality bias when studying past use of these drugs. In light of recent knowledge about the prodromal period before a clinical diagnosis of dementia (which may be more than 10 years), this literature should be reinterpreted. In most studies the exposition duration is insufficient to exclude reverse causality.

Conclusion: There is a need for a study on this topic with a longer observation period. A project is in development to assess this association, hopefully overcoming protopathic bias (reverse causality). We will study this relation with the Torsade cohort (n = 90 000), including the participants from the Canadian Community Health Survey - Annual Component (CCHS) (2007-2016), matched with the merged provincial medical administrative database with 20 years of data (1997-2016).

Exploring perceived educational needs of primary care providers for online training and education in dementia

Lorraine Pirrie¹, Carolyn Steele Gray², Pria Nippak¹,
Dallas Seitz³, Dave Coughlan⁴

¹ Ryerson University

² Bridgepoint Collaboratory for Research and Innovation,
Lunenfeld-Tanenbaum Research Institute, Sinai Health
System

³ Queens University

⁴ ICI Medical Communications

Background/Objectives: High quality, standardized, cost-effective strategies in Canadian primary care provider (PCP) education and training in dementia care and management is lacking. Elearning is a potentially good option, but requires first understanding barriers and facilitators that hinder or

promote elearning behaviours. This user-needs assessment evaluated perceived educational needs and preferences of primary care providers for training and education in dementia within an online environment. A Theory of Planned Behavior framework facilitated the identification of themes according to underlying attitudes towards the perceived value of learning, subjective norms regarding expectations and perceived behavioural (control) factors that may influence primary care provider learning.

Methods: This is prospective, qualitative research study that recruited Ontario primary care providers (I.e. general practitioners and nurse practitioners). Participants were recruited through the authors' professional network, and a total of 19 participants took part in the study. Four focus group sessions, consisting of 2-5 participants, were conducted over a 6 month period (October 2018 - March 2019). Four one-on-one interviews were subsequently conducted in March 2019 to allow for a more in-depth discussion on specific themes identified during the focus group sessions. Focus groups and interviews were conducted in person and remotely via an online video conferencing platform. The Theory of Planned Behaviour constructs of "Intention," (i.e. the behaviour of interest), "Attitudes," Subjective Norms," and "Perceived Behavioural Control" were used to organize and frame the semi-structured questions used during the sessions. These theoretical constructs also helped to organize and identify themes arising from the content analysis of the transcripts.

Results: Theory of Planned Behaviour constructs highlight themes shaping providers' intentions towards learning in the primary care setting. For example, underlying attitudes towards learning demonstrated a salient need for decision supports through educational tools/resources, but also via peer connections. This information-seeking occurs when it is applicable and relevant to clinical practice. The subjective norms construct revealed social pressures to apply standards expected by the College and formal education. In addition, expectations of peers, patients, families/caregivers and self-expectations of patient care and the provider role can influence decision-making, especially with complex conditions like dementia. Self-expectations of what it means to be "a good quality professional practitioner" adds another layer to this paradigm. Finally, the perceived behavioural control (factors) construct highlighted when, why and how learning may happen. Some themes identified are the influence of flexibility of time and source of learning, credibility of information, patient/disease context and motivation on the learning process.

Conclusion: Our analysis reveals important links between theoretical constructs that can create underlying tensions that can promote or discourage primary care provider learning. Tensions between subjective norms (like credibility) and perceived value (relevance of information) can influence provider motivation to learn. Clinical applicability and relevance of information can also conflict with flexibility and time allotted

for learning (perceived behavioural control), when deciding when, how or what to learn. An elearning solution can address these learning tensions by offering 1) potential flexibility, 2) tailoring to clinical needs and 3) providing access to credible sources, which can improve engagement in continuing medical education.

Developing the first Canadian long-term care research consortium

Johannes Teselink¹, Nathan Hermann¹, Dallas Seitz², Fawn Rasquinha¹, Krista Lancot¹

¹ Sunnybrook Health Sciences Centre

² Queen's University

Background/Objectives: Older adults with dementia in long-term care (LTC) represent some of the most vulnerable and exposed consumers of health care services. Neuropsychiatric symptoms (NPS) like agitation, aggression, apathy, anxiety, depression, and psychosis affect 80% of LTC residents with dementia and are a major risk factor for LTC admission. We propose to establish a Canadian alliance of LTC facilities for the performance of randomized controlled trials (RCTs) of innovative pharmacological, non-pharmacological, and education interventions aimed primarily at preventing and treating NPS. In order to be utilized for research purposes, we will determine the characteristics of the recruited facilities and their residents.

Methods: We recruited 22 long-term care homes across Canada for our network and distributed site surveys in order to determine facility and resident characteristics. We asked recruited sites to provide information regarding facility characteristics such as bed count, distance of LTC from closest hospital, frequency of psychiatric services utilized by the LTC, and satisfaction with overall access to mental health services at LTC as well as resident characteristics such as estimate of residents with dementia and estimate of residents with NPS.

Results: Team 11 identified 22 highly motivated LTC facilities that span 7 provinces across the country to create a national network to facilitate research opportunities. These institutions included both profit and not-for-profit, and rural and urban homes, recruited proportionate to population size. According to our survey findings, 17 LTC facilities reported more than 51% of residents with dementia, 3 LTC facilities reported more than 51% of residents with severe dementia, and 3.3 individuals on average were transferred out of facility due to challenging behaviour related to dementia in the past year. Additionally, 90% of the LTC network reported using the MMSE and 50% reported using the MoCA to assess residents with dementia, 100% of the LTC network reported utilizing electronic access, and facilities reported 25-45 minutes as the average time an RN spends per resident per day.

Conclusion: Based on the characteristics gathered on these LTC facilities, an educational intervention regarding optimizing prescribing of anti-psychotics in LTC was implemented in 10 facilities. An application for touch-screen technology was developed and implemented in 10 facilities to help prevent and manage NPS. 12 pilot projects have utilized this network to implement and examine educational, pharmacological, and non-pharmacological interventions aimed at preventing the onset of NPS and minimizing their severity. Upcoming projects include a multicentre trial of Nabilone for Agitation Intervention Trial (NAB-IT) in dementia. Our LTC network has stimulated research across Canada on the prevention and treatment of NPS.

**Family caregiver resilience for older adults with dementia:
A concept analysis**

*Jodi Webber, Kevin Woo
Queen's University*

Background/Objectives: Most older adults with dementia live at home, cared for by network of unpaid family and friends. Caring for a person with dementia is demanding, placing a significant, often negative, impact on the health and well-being of family caregivers. Healthcare systems will need to specifically understand how to support this caregiver resilience if they are to continue to harness and depend on that source of unpaid labour.

Methods: Walker and Avant's concept analysis was used to examine family caregiver resilience while caring for a person with dementia. A literature review using PubMed, CINAHL, PsychInfo and Medline was used for the years 2000-2017. Of the original 73 unique titles, 23 articles met the criteria for inclusion.

Results: Dementia caregiver resilience is characterized by attributes that are linked to hardiness, self efficacy, and rebounding. Social supports, self-concept and a sense of humour are considered the key antecedents. The consequences of resilience - quality of life issues, coping, and mental health - are explored. Results of this analysis will inform health care providers and policy maker strategies to enhance resilience in family caregivers.

Conclusion: Resilience study presents an opportunity to examine family caregivers of older adults with dementia from a strengths-based approach. Concept analysis is a necessary first step in working towards a theory of caregiver resilience. The Canadian healthcare system depends on the vitality and robustness of caregivers and building resiliency skills will be essential if persons with dementia are to be cared for in the community. Further empirical study should include input from caregivers and care recipients.

Can a Group Exergame Intervention Impact Balance, Movement Confidence, and Cognitive Function in People with Dementia or Mild Cognitive Impairment?

Erica Dove¹, Arlene Astell²

¹ *University of Toronto*

² *Toronto Rehabilitation Institute*

Background/Objectives: Participation in exercise programs can benefit people with cognitive impairment (PCI; e.g. dementia). However, many exercise programs offered to this population are passive, unengaging, and repetitive, resulting in poor engagement and long-term adherence. The potential of integrating video games and exercise programs (i.e. 'exergame' programs) is being explored to encourage exercise participation among PCI. However, the impacts on key variables including balance, movement confidence, and cognitive function have yet to be determined. This study aims to examine the impacts of a group exergame 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-four PCI are being 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 at three time points (start, middle, and end) to capture physical indicators of movement confidence (e.g. fluency of motion, visual focus, hesitation) during the intervention. At post-test, 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).

Conclusion: The exergame 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 video game-based exercise interventions to PCI. There is also potential for the MBT intervention to positively impact cognitive function of PCI (as measured through MoCA score). This work can be used as the basis for developing both specific software and future video game-based exercise programs for PCI.

Let's Connect: Family caregiver experiences of playing tablet games at home with relatives with dementia

*Erica Dove, Elicia Chamoun, Arlene Astell
Toronto Rehabilitation Institute*

Background/Objectives: Touchscreen technologies offer the potential of meaningful engagement for people with dementia, but family caregivers often feel they do not have the time or knowledge to support their relatives to use them. Here, we examine the implementation of a home-based, caregiver-supported touchscreen tablet program for people with dementia (Let's Connect) on social isolation, collateral quality of life, and caregiver burden.

Methods: Twenty-six family caregivers (mean age=68.69 years) were trained to support their family member with dementia (n=26; mean age=77.37 years) to play touchscreen tablet games at home, twice per week for four weeks. Caregivers completed the 10-item Social Provisions Scale (SPS-10), the Zarit Burden Scale (Zarit), and the Quality of Life in Alzheimer's Disease (QoL-AD) scale at pre- and post- participation. Post-study interviews were conducted to identify benefits and barriers to implementing touchscreen tablets at home; interviews were then transcribed and analyzed to identify emerging themes.

Results: While SPS-10 (p=0.167) and Zarit (p=0.219) scores did not show changes from pre- to post- intervention, quality of life as assessed by the QoL-AD improved significantly (p=0.021). This suggests that family caregivers felt their loved one with dementia's quality of life improved as a result of the tablet program. From the interviews, five themes emerged regarding caregivers' experiences of introducing tablet games at home: (a) relative's enjoyment, (b) appreciating the shared experience, (c) challenging misconceptions, (d) ongoing support required, and (e) disinterest.

Conclusion: The findings to date, demonstrate that family caregivers enjoyed the experience of playing touchscreen tablet games at home with their loved one living with dementia. Touchscreen tablet games created an outlet for both the caregiver and the person with dementia to partake in a common objective, which created a positive experience for both parties. This work confirms the potential benefits for family caregivers and their relatives with dementia to enjoy touchscreen tablets at home and the success of the Let's Connect training model to deliver these. Additional data from four new sites will be presented.

People with dementia using touchscreen technologies: Tackling stigma and social isolation

*Elicia Chamoun, Erica Dove, Arlene Astell
Toronto Rehabilitation Institute*

Background/Objectives: Social isolation is a primary obstacle faced by people with dementia, with stigma adding to feelings of isolation. These obstacles negatively impact the quality of life of people with dementia as a result of reduced opportunities to engage in the community and the environment around them. To address this issue, we are examining the benefits of a community-based volunteer and staff-supported touchscreen tablet program for people with dementia (Let's Connect), on reducing social isolation and stigma regarding the capabilities of people with dementia.

Methods: Forty-four adult day program clients with dementia (mean age=81.9 years; mean MoCA=9.18/30) participated in a four-week (8 session) touchscreen tablet program, facilitated by trained staff and volunteers (n=30; mean age=46.33 years). Before and after the program, staff and volunteers completed the Dementia Attitudes Scale (DAS), while clients completed the Social Provisions Scale (SPS-10) and Quality of Life in Alzheimer's Disease Scale (QoL-AD). Participants also completed a post-study interview to capture their experiences regarding the tablet program, such as barriers and facilitators to implementation, as well as benefits of the program to themselves and others.

Results: Pre- and post- comparison of clients' SPS-10 and QoL-AD revealed that scores were maintained (SPS-10: p=0.950, QoL-AD: p=0.122). Although there were no significant changes in social isolation as reported on the SPS-10, interviews revealed that participants enjoyed the social aspect of learning and playing together. Pre- and post- comparison of staff and volunteer DAS total scores revealed a significant improvement (p=0.037), largely due to improved scores on the 'Comfort' subscale (p=0.006). Thematic analysis of post-study interviews identified benefits and challenges experienced by clients, staff, and volunteers during the tablet program.

Conclusion: The findings to date, confirm the potential for training staff and volunteers to support people with dementia to engage with touchscreen technology. Additionally, the program provides staff and volunteers opportunities to interact with people with dementia in a new way, thereby by challenging misconceptions regarding their abilities and tackling stigma. Finally, tablets have now become the standard of care in many of the day programs involved in the study, demonstrating the feasibility of implementing and sustaining community-based touchscreen tablet programs for people with dementia. Additional data from four new sites will be presented.

People with dementia learning to play Kinect bowling

*Erica Dove, Arlene Astell
Toronto Rehabilitation Institute*

Background/Objectives: Participation in meaningful activities is a key aspect of living well with cognitive impairment.

Motion-based technologies (MBT) can provide leisure activities to people with cognitive impairment (PCI), but requires a good understanding of how best to support their participation. Errorless learning is used to teach PCI new information or skills, but its application to MBTs has not been explored. The current study examines the longitudinal application of errorless learning techniques to empower PCI to use MBT.

Methods: Thirty-eight PCI (mean age=75.39 years; mean MoCA=12.43/30; 20F) from three community-based adult day programs participated in a group MBT activity (Xbox Kinect bowling) twice per week for ten weeks (20 sessions). Video recorded data from the initial, mid-point, and final sessions were coded to track: (1) number of prompts required by participants per turn, (2) participants' ability to complete turns independently, and (3) duration of participants' turns. Coded data from 23 participants, who were captured on film during all three time points, were compared using repeated measures ANOVA.

Results: Errorless learning techniques such as verbal, gesture, and physical assistance prompts were useful in teaching PCI to use MBT. Repeated measures ANOVA with post-hoc analyses revealed a significant decrease in the number of prompts provided per turn ($p < 0.0001$), a significant increase in the percentage of turns completed independently ($p < 0.0001$), and a significant decrease in the duration of participants' turns over time ($p < 0.0001$).

Conclusion: The results demonstrate that PCI learnt to bowl using Xbox Kinect and improved over time as indicated by requiring fewer prompts from the facilitator, greater number of turns completed independently and faster turns. Errorless learning techniques were applicable when teaching PCI to use MBT, with longitudinal application of these techniques decreasing over time. The findings of this study confirm the benefit of errorless learning and the potential for PCI to benefit from using MBTs, thus challenging negative stereotypes regarding their learning capabilities.

Imaging characteristics of pre-symptomatic familial frontotemporal dementia: a systematic review

Valérie Coulombe¹, Frédéric St-Onge², Synthia Meilleur-Durand², Marianne Lévesque², Caroline Dallaire-Théroux², Leila Sellami², Emmanuelle Paquette-Raynard³, Robert Laforce Jr.²

¹ Cervo Brain Research Center-Université Laval

² CHU de Québec Research Center-Université Laval

³ Bibliothèque de l'Université Laval, Université Laval

Background/Objectives: Frontotemporal dementia (FTD) is a highly genetic disorder, where almost 40% of cases are due to mutations on the MAPT, GRN or C9orf72 genes. Multiple studies report brain changes in pre-symptomatic participants,

but the methodology is highly variable between centers. We aim to document all studies describing changes in the brain of mutation carriers (MAPT, GRN or C9orf72) on structural (T1, T2), functional (fMRI, diffusion tensor imaging (DTI), arterial spin labelling (ASL)), metabolic (fluorodeoxyglucose positron emission tomography (FDG-PET) or Single-Photon Emission Computed Tomography (SPECT)) and molecular (tau-specific tracers for PET scans; tau-PET) imaging procedures.

Methods: Criteria for inclusion in this review are as follows: Report on one of the target imaging methods (MRI, Metabolic or Molecular), Include at least one clearly identified and distinct group of participants with mutations on the targeted genes, Report results on asymptomatic carriers, Report on human adults, and Must report at least baseline measures for participants. No filter will be applied for language and time of publication. MedLine, Embase, AgeLine, Web of Science, CINAHL Plus, Cochrane Controlled Register of Trials (CENTRAL) and Google Scholar will be searched using a free word strategy and an indexed word strategy (where applicable). The Grey Literature will be searched using the tool "Grey Matter: a practical tool for searching health-related grey literature" and a free word strategy on the ProQuest Dissertations & Theses Global database. Risk of bias will be assessed by using the Cochrane Collaboration Tool for Assessing the Risk of Bias.

Results: Main outcomes (differences between carriers and non-carriers on each imaging modality) will be included in separate tables for each genetic group. Single case studies will be reported in the text. Measured cognitive deficits, expected age of onset of participants and differences between asymptomatic and symptomatic participants will be included if available.

Conclusion: This systematic review will highlight to clinicians and researchers what are the earliest changes in the brains of pre-symptomatic carriers of FTD. It will also underline the strengths and weaknesses of current studies in the field and propose new avenues to future researchers.

Volunteer-led activity engagement in residents living in long-term care with dementia

Nicole D. Anderson¹, Sandra Gardner², Lorraine van Zon³, Sally Moy², Mariam Sidrak¹, Janis Sternhill⁴, Gary Naglie¹, Sidney Feldman⁵, Jurgis Karuza⁶, Anna Berall²

¹ Rotman Research Institute, Baycrest

² Kunin-Lunenfeld Centre for Applied Research and Evaluation, Baycrest

³ Toronto Catholic District School Board

⁴ Volunteer Services, Baycrest

⁵ Baycrest

⁶ SUNY Buffalo State

Background/Objectives: More than half of long-term care home residents in Ontario have dementia. Although we are

currently unable to cure dementia-related cognitive impairment, recent evidence indicates that we can stimulate and maintain cognitive functioning in people with dementia, which can have beneficial effects on quality-of-life. There is also evidence that volunteers can be trained to deliver activity engagement programming, augmenting the services provided by staff. Our objective was to evaluate the feasibility of two types of volunteer-led activity engagement (a cognitive stimulation program and a spontaneous leisure activity program), compared to standard volunteer friendly visits, and their effects on resident engagement.

Methods: 73 residents from three Toronto long-term care homes were recruited and assigned to standard friendly visiting (n=26), cognitive stimulation (n=23), or the Program for Leisure Engagement for Active and Spontaneous Experiences (PLEASE; n=24) for approximately three months, with the goal of three ~20-minute volunteer visits per week. The cognitive stimulation program involved a series of graduated reasoning, memory, and attention exercises, while the PLEASE program facilitated person-centered and meaningful leisure activities including games, music, iPad use, drawing, and conversation based on the interests of the residents to support social activity engagement. At each visit, the volunteers rated the residents' social interest, active and passive engagement, disengagement, pleasure, negative affect, and sadness. Cognitive functioning was also assessed prior to and after the program, using the Dementia Rating Scale and the Hopkins Verbal Learning Test.

Results: The average age of the residents was 87.8 years (SD=8.1). 26 participants completed the full cognitive assessment, and 42 were able to complete at least part of it; on average, the residents were severely impaired, and cognition did not change from pre- to post-test. 71 residents received visits and participated in an average of 13.7 sessions (SD=7.5, n=22) in cognitive stimulation, 25.1 (SD=5.8, n=24) in PLEASE, and 17.4 (SD=10.4, n=25) in friendly visiting. Volunteer ratings indicated that residents were socially interested and actively engaged the majority of the time spent in their sessions. Residents showed signs of pleasure and also displayed some passive engagement. Disengagement, negative affect, and sadness were rarely observed. Challenges included recruiting and retaining volunteers, as well as the fact that residents were not always available or wanting to engage with the volunteers.

Conclusion: Long-term care residents can engage in meaningful cognitive and leisure activities, even when they have severe dementia, and these activities can be facilitated by trained volunteers. Residents are able to stay socially interested and actively engaged over the course of the intervention. While it can be challenging to recruit and retain volunteers, and to negotiate residents' schedules and readiness to engage, volunteer-administered programs such as these nevertheless provide a resource-friendly way to keep residents with severe dementia socially and cognitively engaged.

Developing methods to assess time and effort related to caregiving using a continuous, unobtrusive home-based assessment system.

Neil Thomas¹, Nora Mattek², Thomas Riley², Christina Reynolds², Jennifer Marcoe², Nicole Sharma², Jeffrey Kaye²

¹ *Bruyere Research Institute*

² *Oregon Health and Science University*

Background/Objectives: Caregivers of individuals with dementia experience higher levels of medical comorbidities and stress. Current assessment methods involving significant participant interaction, such as caregiver diaries, can be considered an extra source of burden by caregivers. Developing unobtrusive methods to detect burden levels could improve upon current techniques and complement subjective assessment measures. Home-based assessment systems can detect changes in physical and health outcomes in individuals with cognitive impairment. These systems could also be employed to assess caregivers living with these individuals. We report findings from a natural history clinical trial enrolling participants with MCI or AD living with a caregiver.

Methods: Data is derived from caregivers enrolled in EVALUATE-AD (Ecologically Valid, Ambient, Longitudinal and Unbiased Assessment of Treatment Efficacy in Alzheimer's Disease), a clinical trial to detect standard dementia treatment transitions. A sensing and computing system is installed in each couple's home for up to two years that continuously provides data on health and functional outcomes related to caregiver engagement (e.g. time spent together, activity level, total sleep time and awakenings). Caregivers complete the Zarit Burden Interview (ZBI), the Neuropsychiatric Inventory (NPI-Q), and Functional Assessment Scale (FAQ) at baseline and every three months, and these measures are compared to the sensor-based objective outcomes.

Results: Twenty-five homes with 50 participants have been enrolled. Caregivers have a mean age of 72 years old and baseline mean ZBI score of 10.5 (range 1-25). NPI-Q and FAQ scores for individuals with MCI or AD are 4.2 (range 0-12) and 9.2 (range 0-25) at baseline. Caregivers with high reported levels of burden at enrollment had a significantly higher total daily step count. Changes in their activity level are measured continuously over the duration of the monitoring period. There have been no participant drop outs after deployment of the system. Two participant homes completed the trial and both caregivers strongly agreed with the statements "I do not mind being monitored unobtrusively in my home" and "I did not find the sensor system was an extra source of stress" on the study exit survey.

Conclusion: Unobtrusive, home-based monitoring offers a novel method to assess time and effort spent on

caregiving-related tasks that is well accepted by caregivers living with individuals with dementia. A validated group of sensor-based measures that differentiates high versus low levels of burden could serve as an objective outcome in caregiver studies. The system collects data continuously and could be deployed before, during and after caregiver-directed interventions, to better measure their impact on burden levels. This assessment method could also evaluate changes in caregiver-related activities in studies examining treatments aimed at reducing behavioural and psychological symptoms in individuals with dementia.

The utility of the Rey Auditory Verbal Learning Test as a telephone screening tool for detecting amnesic cognitive impairment in older adults with subjective cognitive decline

*Shreya Jagtap, Shlomit Rotenberg, Susan Vandermorris, ND Anderson, DR Dawson
Baycrest Health Sciences*

Background/Objectives: People with subjective cognitive decline (SCD) are concerned their cognition is declining but have intact cognition (Tales, 2015). Individuals with amnesic mild cognitive impairment (aMCI) also have cognitive concerns, in addition to memory deficits, but no significant functional deficits. Efficient research recruitment requires an effective screening tool to distinguish SCD from MCI and/or AD. The Rey Auditory Verbal Learning Test (RAVLT) has clinical utility for detecting aMCI (Zhao et al., 2015). However, its utility as a telephone screening measure in older adults is unknown. We examined the utility of a telephone screen RAVLT in distinguishing SCD from aMCI.

Methods: Eighty-three community-dwelling older adults (mean age = 71.37, SD = 6.96) completed the RAVLT as part of a screening procedure for a larger study. In order to be eligible for the study, participants had to meet criteria for SCD. Participants who confirmed memory concerns at phone screening by either endorsing (a) having current memory problems or (b) noticing a decline in their memory over time, were invited to complete a neuropsychological assessment. This assessment included the Hopkins Verbal Learning Test (HVLT), Brief Visuospatial Memory Test-Revised (BVMTR) and the incidental recall trials from Digit Symbol Coding. Participants were defined as having SCD if they had scores below 1.5 standard deviations of age-matched norms in no more than two memory sub-tests administered. Two clinical neuropsychologists consulted on individuals who had multiple scores within the impaired range to determine if they had SCD (n = 55) or aMCI (n = 28).

Results: The telephone RAVLT total learning score was significantly correlated with HVLT scores during the in-person assessment, ($r = .53, p < .001$), indicating the validity of the

telephone RAVLT. Specificity and sensitivity analyses at a cut-off of 43.5 revealed that the RAVLT was 75.0 % sensitive and 67.3 % specific at identifying aMCI (AUC = .765).

Conclusion: The RAVLT shows potential for use as a telephone screen. A cut-score of 43-44 provides reasonable sensitivity and specificity. While research on other samples is necessary, we suggest that the RAVLT may be useful for streamlining research.

Patients Not Paperwork: Efficient & Excellent Documentation by Design

Catherine Chater¹, Jaspreet Soor²

¹ VHA Home Healthcare/University of Toronto - Adjunct Lecturer

² VHA Home Healthcare

Background/Objectives: Reallocating clinician time away from administration and back to direct patient care has proven a challenge in a health system that increasingly relies on documentation to demonstrate regulatory adherence and performance metrics. In many healthcare settings, patients receive much less of a clinician's time than does paperwork. Burnout & job dissatisfaction rates reflect the resultant stress on clinicians and ensuing impact on client care. Despite their significant advantages for care coordination/privacy/reporting, even the introduction of electronic medical records does not reduce a clinician's charting time. Restructuring of the documentation process itself is needed to reduce documentation burden.

Methods: Documentation practices were overhauled in the course of developing new paper-based chart forms and an electronic medical record. Rigorous review of regulatory, accreditation, funder metrics, risk management & policy was blended with a synthesis of the clinical best practices applicable to the defined scope of this community-based practice environment. By therein identifying, with accuracy and precision, the essential required content of a clinical documentation record, design innovations to efficiently align to these targets were developed in collaboration with point of care users and tested/refined through use of in-field continuous QI testing and chart audit data. Change management strategy was employed to identify and ameliorate inaccurate and imprecise habitual and culturally-embedded charting practices.

Results: Data entry has been attuned to real-life workflow, clinical analysis/prompts now cue best practice decision making, and documentation volume has been cut by up to 60%. The tool's design has been so successful, that voluntary uptake of the paper-based PDSA trials has reached over 90%. Chart audit data reflects more consistent application of documentation/practice standards. Early formal survey results strong satisfaction by users.

Conclusion: Effective clinical design of documentation is of paramount importance to optimize use of limited health resources. Thoughtful examination of standards with clinical best practice and provider workflow, can positively impact both client care and provider job satisfaction.

Multi-modal Optical Coherence Tomography imaging as non-invasive biomarker of Dementia

Xiang Ji¹, Morgan Koo¹, Jordana Compagnone², Peter Kertes³, Sandra E. Black¹

¹ LC Campell Cognitive Neurology Research Group, Sunnybrook Hospital

² C Campell Cognitive Neurology Research Group, Sunnybrook Hospital

³ Ophthalmology & Vision Sciences, Sunnybrook Hospital

Background/Objectives: Early detection of Alzheimer's Disease (AD) biomarkers may enable prevention measures to slow disease progression. Therefore, the search for reliable techniques to detect and monitor for early biomarkers is very important. The retina is a unique window into the brain, as it shares similar embryological origins. Spectral-domain Optical Coherence Tomography (SDOCT) is a noninvasive system that can provide in vivo high-resolution retinal images and its vessels. This prospective, observational study aims to compare retinal measurements between AD, mild cognitive impairment (MCI) and normal control (NC) cohorts, and between the two eyes acquired within one visit as an estimate of reliability.

Methods: All participants with no known retinal diseases underwent non-mydratric SDOCT for segmentation of retinal nerve fiber layer (RNFL) thickness, macular thickness, and para-foveal vascular measurements using OCT's on-board algorithms. Retinal findings were compared between patients and NCs with independent-sample t-test, and comparisons between the right and left eyes as estimates of reliability was analyzed with intra-class correlation (ICC) statistics using Statistical Package for Social Studies software (SPSS). Specifically, groups were compared on: 1) peripapillary RNFL thickness (μm) across the four 90-degree retinal quadrants; 2) macular retinal ganglion cell (RGC) layer thickness (μm); 3) area of the foveal avascular zone (FAZ, mm^2); and 4) para-foveal vessel density across the ETDRS grid (mm^{-1}). ICC values were calculated for each of these retinal measurements to given an estimate of reproducibility between the two eyes using SDOCT.

Results: These preliminary results were obtained from both eyes in 17 participants (62-81 years of age). The mean peripapillary RNFL thickness did not show significant differences between AD/MCI patients and NCs across each the four retinal quadrants ($p = 0.44-0.87$). Moderate to excellent reliability was shown for all quadrants (ICCs = 0.60-0.95). The mean RGC layer thickness was reduced by $10\mu\text{m}$ in the

patient cohort in comparison to NCs, but this difference was not significant ($p = 0.44$). Excellent reliability was shown for SDOCT's RGC measurement (ICC = 0.95). The patient cohort showed lower para-foveal vessel density (difference of $2\mu\text{m}$, $p = 0.47$) and larger FAZ (difference of 0.04mm^2 , $p = 0.88$) than NCs. Furthermore, poor reliability estimate was demonstrated for vascular density (ICC = 0.21), whereas good reliability was shown for FAZ measurements (ICC = 0.77).

Conclusion: The preliminary ICC data showed that SDOCT measurements including structural thickness and vascular parameters can be highly reproducible. In addition, the OCT was able to show some RNFL and macular thickness reductions as well as slight FAZ enlargement in the patient group when compared to NCs, albeit not statistically significant given the current limited sample size. The present study showed that the OCT can provide early in vivo retinal biomarkers of neurodegenerative disease; further studies with a larger sample size and longitudinal design will be able to confirm retinal changes in the AD cohort.

Use of Medium chain triglyceride (MCT) oil in subjects with Alzheimer's Disease: a randomized double-blind placebo cross over study, with an open label extension.

Angela Juby¹, Diana Mager¹, Christopher Davis¹, David Jay², Toni Blackburn³

¹ University of Alberta

² Grant MacEwan University

³ Alberta Health Services

Background/Objectives: Cerebral glucose metabolism is impaired in subjects with Alzheimer's disease (AD). Under conditions of low glucose availability the brain has the capacity to use ketones as an alternative energy source. The usual source of ketones is break down of stored triglycerides, and occurs in fasting or low calorie intake states. This endogenous ketone production has been shown to be helpful in other neurological diseases, such as epilepsy, but not in AD. Practically, it is difficult to reduce calories sufficiently for an endogenous ketogenic response. Medium chain triglycerides (MCT) are known to be an exogenous (dietary) source of ketones.

Methods: This study is to evaluate the impact, if any, of MCT oil supplementation in AD subjects. It is a six month randomised, double blind, placebo, cross over study, with 6 month open label extension evaluating MCT oil versus olive oil on cognition, behavior and activities of daily living function in community dwelling AD subjects. One month dose titration (15mls-30mls-45mls or maximum tolerated dose (MTD) daily) followed by 3 months of MTD, occurred in the cross-over phase. This was followed by 6 months of open label extension of MTD MCT oil. Subjects were allowed to continue all medications including cholinesterase inhibitors, memantine and antidepressants provided the doses remained

stable during the study. This study was approved by the Health Canada (HC) and the local Ethics Board. Patients with comorbid Diabetes were not included as per HC requirement.

Results: Twenty AD subjects completed the first 6 months, and 19 completed the full 15 months. Participant's age ranged from 54-84yrs (average age of 72.6yrs), and included 11 men and 9 women. 70% had College/University education. Baseline Mini Mental status Examination (MMSE) score 22.6/30 (10-29). Montreal Cognitive Assessment (MoCA) 15.6/30 (4-30). Baseline Cognigram® Part 1 ranged from 65-106, Part 2 from 48-107. There were no significant differences between the two groups at baseline. Apo E4 status was homozygous in one subject, and heterozygous in nine (50% overall positive ApoE4). Average MCT oil consumption was 1.8 tablespoons daily (25.2g, 234kcal). There was individual variability in MMSE and MoCA over the course of the study, but most remained stable or improved. Four (20%) declined more rapidly than expected (based on their initial MMSE). There was no difference in average MCT intake in "decliners". No change in serum lipids or % body fat occurred.

Conclusion: Only recently has attention been drawn to the use of MCT oil as a source of ketones for AD subjects, with the hope that this may improve their brain metabolism and thereby cognitive function. The objective of this study is to evaluate the impact, if any, of MCT oil on cognition, activities of daily living (ADLs) and behavior in AD subjects. Preliminary analysis shows stabilization in cognition. This is not what would have been expected in these established AD patients. The differences between responders and decliners is being evaluated further.

Assessing the ketogenic response in blood after varying doses of Medium Chain Triglyceride (MCT) oil given to subjects with and without Alzheimer's disease.

Angela Juby¹, Dion Brocks¹, Christopher Davis¹, David Jay², Diana Mager¹

¹ University of Alberta

² Grant MacEwan University

Background/Objectives: Medium chain triglyceride (MCT) oil intake is increasingly being used as a source of exogenous ketones given its potential to improve cognitive performance. In the limited literature using MCT oil formulations, the assumption is always made that there is a linear dose response in the production of ketones with increasing doses. This study is the first to look at a ketone dose response in different ages and disease states, to varying doses of MCT oil.

Methods: Pharmacokinetic study evaluating the ketogenic response to 3 doses of MCT oil (14g, 28g, 42g) in healthy subjects with no cognitive deficits <65years, ≥65years, and those with Alzheimer's Disease. The test oil used was

Bulletproof Brain Octane® MCT oil which is 100% C8:0. Test oil was given in a standardized fruit drink at baseline. B-hydroxybutyrate (BHB) levels were measured at baseline, and every hour thereafter for a total of 5 hours (using a finger stick sample). Water was provided ad libitum during the study day. Subjects attended for four different days for the four different doses (0g, 14g, 28g, 42g). Each participant started at the lowest dose to assess tolerability to continue the study. Side effects (gastrointestinal upset, etc) were documented by trained personnel. Data was also collected on body composition, BMI and pre-study breakfast. The study was approved by Health Canada and the local HREB.

Results: 25 participants, all completed all 4 days of the study and the total daily evaluation. There were 8, 9 and 8 participants in the respective groups, with an average age of 44yr (25-61), 79yr (65-90) and 78.6yr (57-86) respectively. Pooled data showed the expected linear dose response relationship with baseline corrected area under the blood vs. time curve ($r^2=0.98$) and maximum concentrations ($r^2=0.97$). There was no difference between pooled data of the 3 groups. However, there was marked individual variability in response with the maximum BHB response to the 42g dose varying from 0.4 -2.1mmol/l. In addition, the time to reach the maximum BHB response at each dose varied depending on the dose, and varied within an individual. This did not seem to be related to age or BMI. Four participants (16%) experienced "flu-like" symptoms with either the 28g or 42g dose, or both, which lasted approximately 2 hours.

Conclusion: This study is the first to look at comparative individual responses in blood to varying MCT doses. The large inter-individual variability poses challenges in interpreting clinical responses in trials. Eighteen (72%) subjects experienced some minor GI discomfort which was not necessarily related to the measured blood BHB level. 28% subjects experienced no side effects. Further analyses are under way to see if there are any predictors of the BHB response and tolerability to the MCT oil.

Spatial distributions of white matter hyperintensities in the corpus callosum can help distinguish mixed dementia from Alzheimer's and vascular dementias

Hyunwoo Lee¹, Vanessa Wiggermann², Alexander Rauscher², Kevin Lam³, Roger Tam⁴, Karteek Popuri⁵, Mirza Faisal Beg⁵, Claudia Jacova⁶, Vesna Sossi⁷, Jacqueline Pettersen¹, Ging-Yuek Robin Hsiung¹

¹ Division of Neurology, Department of Medicine, University of British Columbia

² Department of Physics and Astronomy, University of British Columbia

³ Djavad Mowafaghian Centre for Brain Health, University of British Columbia

⁴ Department of Radiology and School of Biomedical

Engineering, University of British Columbia

⁵ School of Engineering Science, Simon Fraser University

⁶ School of Graduate Psychology, Pacific University

Oregon

⁷ Department of Physics & Astronomy, University of British Columbia

Background/Objectives: Alzheimer's disease (AD) and vascular dementia (VaD) coexist as 'mixed dementia' in a large proportion of clinically diagnosed AD cases as confirmed by autopsy.[Wang_2012][Langa_2004] VaD is difficult to differentiate from AD due to its heterogeneity.[O'Brien_2015] VaD tends to impact executive, frontal and semantic functions. However, areas of cognitive decline may overlap with those found in AD depending on the frequency and location of cerebrovascular events.[Suri_2014] Such heterogeneity is inherent in MD, which makes it challenging to diagnose premortem. Yet, distinguishing MD from AD or VaD is important because MD likely requires different therapies from those in 'pure' AD or VaD.

Methods: White-matter hyperintensities (WMHs) on MRI are a common feature among AD, VaD and MD. We investigated whether the spatial distributions of WMHs differed between AD, subcortical VaD (SVaD) and MD, within specific white-matter (WM) regions-of-interest (ROIs). Here, we focused on the corpus callosum (CC), whose genu and splenium are known to be affected by both VaD and AD.[Palesi_2018] In this cross-sectional study, N=17 participants (subtypes: 7 MD/5 SVaD/5 AD; Sex: 11M/6F; Age: 75±8yrs) were scanned on a 3T Philips Achieva. Areas of WMHs were segmented on Fluid Attenuated Inversion Recovery (FLAIR) images using a combination of intensity thresholding and manual correction. FLAIR images and WMH masks were individually registered linearly and then non-linearly to the FSL MNI-152 template. The CC-ROIs were obtained from the JHU-WM atlas (MNI-152 space). Within each ROI, the proportion of WMH volume to ROI volume was calculated (i.e. $(WMH \cap ROI \text{ voxels}) / (ROI \text{ voxels}) = WMH/ROI \text{ ratio}$).

Results: We used a general linear model to predict the ratios of WMH to ROI volume from the diagnosis-subtypes, adjusting for age, sex, and presence of cardiovascular conditions (to account for the effect of hypertension). The model yielded a significant diagnosis-subtypes effect in the genu of CC ($p=0.0045$). In the genu, the MD subtype was associated with a significantly higher WMH/ROI ratio compared to the AD ($p=0.005$) and SVaD ($p=0.0026$). The ratio was not significantly different between the AD and SVaD subtypes. Diagnosis-subtypes effects for the body and the splenium of CC were insignificant. Average total WMH volumes were (mean±SD) AD: 5191 ±4693mm³, MD: 34680 ±17059mm³ (significantly greater than AD), SVaD: 20896 ±14920mm³ (not significantly different from MD or AD). Average CC volumes were (mean±SD) AD: 33307 ±3826mm³, MD: 29521 ±4116mm³, SVaD: 26541 ±5847mm³.

Conclusion: The MD subtype of our study cohort was characterized by a significantly greater presence of WMHs in the areas associated with the genu of CC. Potential interaction between neurodegenerative and cerebrovascular pathologies could be synergistically mediating additional WM damage in this area, but our small sample size limits us from generalizing the findings. Larger follow-up studies are warranted to verify the involvement of CC damage, specifically the genu, in MD compared to other types of dementia.

Dementia-Care services among ethnic and racial minorities in Canada: a scoping review

Jessica Bindra, Lora Appel
York University

Background/Objectives: Following global changes prioritizing dementia-care, Canada passed Bill C-233, a National Strategy for Alzheimer's Disease and Other Dementias with definitive timelines, reporting structures, and measurable outcomes. Current policies have treated the senior population and their caregivers as homogeneous, consequently underrepresenting ethnic and racial minorities. Minorities face additional barriers to accessing healthcare, and thus Canadians should prioritize understanding the ways ethnic and racial intersectionalities affect people with dementia and their caregivers. This paper examines the extent and nature of dementia-care services among minorities in Canada and highlights gaps in programming and opportunities for the design and implementation of culturally-relevant services.

Methods: A scoping review (Arskey & O'Malley framework, 2005) was conducted using the five-step framework; of the 21,537 studies initially extracted, only 12 peer-reviewed publications met the inclusion criteria incorporating all the key concepts: minorities, dementia, and healthcare services. A systematic search was conducted using the York University Database in February 2019; relevant studies and reference lists were searched in the English language, an extraction form was used to chart the data, collate studies and conduct a thematic analysis. Contents from the journal were assigned a code and then were searched for patterns and themes across. Finally, themes were grouped chronologically by health care interaction.

Results: Study methodologies were predominantly qualitative semi-structured interviews and thematic analyses. These revealed three distinct points in time that impact minorities' experiences of dementia care: condition awareness, clinical diagnosis, and medical treatment. Lack of awareness on dementia and screening related to not having heard about dementia and/or ability to identify dementia-like symptoms to access services and cultural beliefs and attitudes about ageing and cognition. Structural barriers accessing a clinician and other associated factors such as biases, when obtaining

a clinical diagnosis. Finally, when people with dementia and their caregivers are unable to navigate through the health care system, this can result in treatment neglect. While the studies provided an in-depth understanding of the minority experience of Dementia, none articulated strategies for culturally-relevant programming and interventions to minimize barriers and increase awareness.

Conclusion: Research demonstrates that loss of language contributes to social isolation and hesitancy to use services, thus exacerbating difficulties minorities face when navigating their condition. Opportunities for culturally-relevant services should take place at distinct points in the medical pathway: awareness, diagnosis, and treatment. Canadians should further explore the availability of culturally-relevant dementia services as examples from other countries indicate positive health outcomes. There is room for critical analysis of policy research amongst ethnic-gerontology grounded in social critical theory and intersectional lens. Limitations with this method suggest wider research and understanding of culturally relevant programming for caregivers and people with dementia.

Is this progressive aphasia? Unblurring the line between linguistic and executive deficits in a case of neurodegenerative apraxia of speech.

Liziane Bouvier ¹, Laura Monetta ¹, Catherine Brodeur ², Paolo Vitali ³, Vincent Martel-Sauvageau ¹

¹ Université Laval

² Institut Universitaire de Gériatrie de Montréal

³ CIUSSS Nord-de-l'Île-de-Montréal

Background/Objectives: Progressive apraxia of speech is defined as a neurodegenerative disorder affecting articulatory planning or programming. When apraxia of speech is the only or predominant neurological deficit over the first two years, it should be referred to as primary progressive apraxia of speech (PPAOS). Despite the growing recognition of PPAOS, its differential diagnosis is still challenging. Its evolution, including the development of concomitant cognitive, linguistic and motor deficits, is still unclear. The objective of this study was to describe the evolution of the general cognitive profile of a case of PPAOS over 18 months.

Methods: This case-study reports the evolution of a 72 years-old French Canadian female with a neurological diagnosis of PPAOS, one year to three years post-onset. Assessment of motor speech, language and cognition was performed every six months over 18 months.

Results: At the first time of evaluation, the participant presented a profile of progressive primary apraxia of speech with predominant prosodic difficulties; concomitant orofacial apraxia and writer's cramp, and preserved language skills.

The equivocal presence of a slowdown in processing speech, dysarthria and upper limbs apraxia was also noted. She progressively developed spastic dysarthria, with equivocal hypokinetic signs, had slightly increased articulatory difficulties and increased phono-respiratory coordination difficulties. At the last follow-up, she had moderate-to-severe motor speech deficits, but also complained of lexical access and discourse comprehension difficulties. The evaluation revealed no language impairment per se, but a significant decrease in verbal fluency, inhibition and verbal working memory.

Conclusion: We report the evolution of a participant with degenerative apraxia of speech over 18-months. Although motor speech remained the most impaired domain, the patient had developed concomitant deficits by the last evaluation. What could have been seen as progressive agrammatic aphasia (i.e. linguistic deficit) was caused by the development of executive impairments, underscoring the importance of an in-depth evaluation of language and cognitive abilities.

Dementia, delirium and outcomes of hospitalization with acute respiratory illness

Melissa Andrew ¹, Judith Godin ², Shelly McNeil ³, Janet McElhaney ⁴

¹ Division of Geriatric Medicine, Dalhousie University

² Geriatric Medicine Research, Dalhousie University

³ Division of Infectious Diseases, Dalhousie University

⁴ Health Sciences North Research Institute

Background/Objectives: Dementia and delirium have important associations with acute care health service use and outcomes, yet are often incompletely considered in studies of other health conditions. We aimed to study the prevalence of dementia, cognitive impairment not dementia (CIND), and delirium and their association with outcomes in older adults admitted to acute care hospitals as part of active influenza surveillance in the Canadian Immunization Research Network (CIRN) Serious Outcomes Surveillance (SOS) Network.

Methods: During the yearly influenza season, patients admitted to SOS Network hospitals with broadly defined acute respiratory illness are enrolled and tested for influenza. Given the important burden of influenza in older adults, frailty and function are important considerations, and data collection includes multiple domains based on the principles of Comprehensive Geriatric Assessment for all patients aged 65+, as well as completion of the Clinical Frailty Scale (CFS). Here we pooled data across three influenza seasons (2011/12, 2012/13, and 2013/14). Baseline cognition was classified based on the best available clinical data (chart notes, interview with patient and/or caregivers) as normal cognition, CIND, or dementia. Clinical diagnosis of delirium was also identified using chart documentation and/or interview. Outcomes included length of stay (LOS), 30-day post discharge survival, and admission

to a Long-Term Care Facility (LTCF). Outcomes stratified by sex, influenza case/control status, and adjusted analyses will be presented.

Results: 11,379 inpatients were enrolled, of whom 7,524 were aged 65+; 6,298 had data for cognitive status. Among these 3,319(52.7%) were women and 2,427(38.5%) had laboratory-confirmed influenza. Baseline cognition was normal in 71.6%; 12.8% had dementia and 7.0% CIND. 10.9% had delirium. Compared to those without dementia, patients with dementia were older [mean 85.2(SD 7.0) years vs. 78.8(SD 8.2), $p<0.001$], had higher frailty [mean CFS 6.8(SD 1.2) vs. 5.2(SD 1.5), $p<0.001$], and had longer LOS [mean 12.6 days (SD 15.3) vs. 11.2(SD 12.6), $p<0.05$]. Patients with delirium were older, more frail, and had longer LOS (all $p<0.001$) compared to patients without delirium. Patients with dementia had higher mortality than those without (20.5% vs. 9.2%, $p<0.001$) and were more likely to be discharged to LTCF (33.4% vs. 6.5%, $p<0.001$). Among patients with delirium, 19.8% died (vs. 9.5% without delirium; $p<0.001$) and 12.6% were discharged to LTCF (vs. 9.6%, $p<0.05$).

Conclusion: Dementia and delirium are common among older inpatients admitted to hospital with acute respiratory illness in the context of active influenza surveillance, but likely remain under-recognized in these acute care populations. Dementia and delirium were associated with increased frailty and poor outcomes; a third of patients with dementia were discharged to LTCF. The associations between frailty, cognitive impairment, outcomes of other health conditions and health services use remain important areas of study.

Geriatric pharmacology information design materials to optimize prescribing: a protocol for a randomized controlled trial.

Thomas Laughton¹, Joanne Ho², Jennifer Tung³

¹ University of Waterloo

² McMaster University, Schlegel Research Institute for Aging, University of Waterloo

³ Grand River Hospital

Background/Objectives: Polypharmacy, multimorbidity and age-related changes put older adults at an increased risk for adverse drug events and complicate prescribing. Accessing text-based, drug information resources can be difficult for time-pressed clinicians. Information designs that combine text and images have been found to be more user-friendly and enjoyable to read compared to text-only formats. Though the use of infographics in healthcare has gained popularity, their ability to convey geriatric pharmacology information is unknown. In this randomized controlled trial, we will assess the efficiency and user-friendliness of GeriMedRisk Geriatric Pharmacology Information Design (GPI) materials compared to other geriatric pharmacology and pharmacotherapy resources.

Methods: We will conduct a randomized controlled trial with prescribing clinicians from January 31, 2019 to March 1, 2019. Consenting physicians, pharmacists and nurse practitioners are randomized to use either GPI materials ($n=50$) or their own usual pharmacological resources ($n=50$) to answer 5 case-based questions about safe prescribing in older populations. The Health Professionals' Inventory of Learning Styles (HPILS) will be used to assess how learning styles might affect the elements that clinicians value in GPIs. After the HPILS, all participants will complete a knowledge and retention test from memory. The primary outcome will be the amount of time participants take to answer the 5 case-based questions. A secondary analysis will include their knowledge retention, as defined by their test scores, to evaluate the relative effectiveness of the GPI materials. Additionally, participant feedback will be collected to further refine the GPI materials.

Results: This research is currently in progress. We anticipate that participating clinicians will have a variety of learning styles. GPI materials may be an efficient and effective method of conveying pharmacological information to optimize prescribing to patients of advanced age with complex medical and mental illnesses.

Conclusion: This research is currently still in progress.

The Case Finding study: a novel community-based recruitment approach for engaging participants with early cognitive decline.

Joseph B. Dubé¹, Tianzhen Lin², Sarah Best³, Julia Trueman³, Patricia L. Sargeant², Michael J. Borrie³

¹ Parkwood Research Institute

² Western University

³ Parkwood Institute

Background/Objectives: Recent cognitive randomized control trials and observational studies are seeking participants with early symptoms of cognitive decline. The Case Finding study, begun in 2009, which utilizes self-referral to identify and evaluate potential research participants for cognitive studies based on self-identified memory concerns.

Methods: Advertisements around London, Ontario, promoted the opportunity for cognitive study participation. Inclusion criteria were subjective memory concerns, age ≥ 55 years old, and an interest in cognitive research. Exclusion criteria involved secondary causes of cognitive impairment such as stroke or unmanaged depression. Participants' cognition, mood, and activities of daily living were assessed in-person by a research coordinator using clinical neurocognitive screening tools. A geriatrician determined a clinical suspicion of either subjective cognitive decline (SCD), mild cognitive impairment (MCI), dementia, or other condition. Participant demographics and study enrollment were analyzed retrospectively using t-tests, ANOVA, or chi-square analysis.

Results: Since 2009, 207 of 270 (77%) respondents presented for baseline in-person assessment. 95 participants (46%) were assessed as having SCD, 94 participants (45%) had MCI, and 18 (9%) had dementia. To date, 61 participants (29%) enrolled in cognitive studies while 11 participants (5%) did not meet additional study screening criteria and 135 participants (66%) have not yet screened for additional studies. The Case Finding Study has shown evidence of success in identifying motivated candidates for cognitive studies from the community and connecting them to cognitive research opportunities. Limitations of this study include incomplete demographic and additional study enrollment records which may have understated participant study enrollment.

Conclusion: This approach facilitates study enrollment for participants with SCD and MCI, and provides an approach for ongoing monitoring of potential participants' cognition and interest in a particular type of research study.

The Canadian Collaboration on Neurodegeneration and Aging – Platform 1 – COMPASS-ND Study. Planning and Implementation

Michael J. Borrie¹, Sarah Best², Jennifer Fogarty³, Nimi Bassi¹, Cynthia Di Prospero⁴, Victor Whitehead⁵, Randi Pilon⁵, Natalie A. Phillips⁶, Howard Chertkow⁷

¹ Parkwood Institute

² Parkwood Research Institute

³ Western University

⁴ Parkwood Institute, Canadian Consortium on Neurodegeneration in Aging

⁵ Bloomfield Centre for Research in Aging, Lady Davis Institute, Jewish General Hospital, McGill University

⁶ Concordia University, Lady Davis Institute for Medical Research

⁷ Baycrest Health Sciences and Rotman Research Institute

Background/Objectives: The Canadian Collaboration on Neurodegeneration and Aging (CCNA) is a study of people with cognitive impairment or dementia funded by CIHR and study partners engaging 360+ dementia researchers and 20 teams. The 8 platform supporting the teams include the Clinical Cohorts Platform; COMPASS-ND Study. Degenerative cognitive impairment can be caused by a heterogeneous group of disorders in interaction with a heterogeneous set of influences, including life experiences, sex differences, and other factors, that can be explained, characterized and predicted using an integrated multimodality approach.

Methods: 1. To create cohorts of participants with various cognitive disorders 2. Integrate a wide range of experimental, clinical, imaging and genetics expertise 3. Addresses causes, identification, management, treatment and prevention of cognitive conditions in aging population. 4. Collect biospecimens, imaging, genetics, and brain donation to support the 20 national research teams.

Results: In July 2014 a Clinical Cohort Working Group met monthly by teleconference (TC) to design a comprehensive clinical protocol. Since July 2015, the Platform Implementation Team has met weekly. The protocol includes clinical questionnaires, neurological examination, neuropsychology testing, blood and CSF biomarkers and MRI brain imaging. The 7 clinical cohorts include Subjective Cognitive Decline (244 for intervention trials in Toronto and Montreal and 56 from other sites) MCI (400), MCI with subcortical vascular lesions (200), mild dementia of mixed etiology (200), mild Alzheimer's Disease (150), Parkinson's Disease dementia spectrum (Lewy Body disease, Parkinson's dementia, MCI in Parkinson's disease) (200), frontotemporal disorder (FTD) (behavioural variant FTD, primary progressive aphasia, progressive subnuclear palsy and cortical basal syndrome) (200) for a total of 1600 participants. In addition, 660 normal elderly controls have been added.

Conclusion: To date 29 sites have completed signed agreements and contracts, and staff and have been initiated with a total of 32 sites anticipated. Over 900 participants have been recruited, with the largest group having MCI. Recruitment strategies are being implemented through TC's. COMPASS-ND Study is established, implemented and is actively recruiting.

Delirium Case Finding in COMPASS-ND

Sarah Best¹, Timothy Wong², Nada Elhayek², Michael J. Borrie², Monidipa Dasgupta³, Kenneth Rockwood⁴, Daniel Davis⁵, Niamh O'Regan³

¹ Parkwood Research Institute

² Parkwood Institute

³ Western University

⁴ Dalhousie University

⁵ University College London

Background/Objectives: Delirium occurs in at least 25% of acute older inpatients, affecting approximately 500,000 Canadians per year. It is independently associated with adverse outcomes with estimated annual costs of \$20 billion; this will only increase with population aging. Delirium and dementia have a bidirectional relationship. Delirium occurs in up to 89% of hospitalized patients with dementia. Reciprocally, delirium is a strong risk factor for incident dementia and worsening cognitive decline. Despite a greater appreciation of this emerging relationship, major questions remain, including the extent to which underlying mechanisms may be shared or distinct, and crucially, what might be modifiable. Nonetheless, it is clear that delirium could be a target for intervention, and hence presents a major opportunity for modifying cognitive trajectories in neurodegenerative disease and the secondary prevention of dementia. Embedding delirium case ascertainment within COMPASS-ND will provide a unique capacity to leverage the comprehensive profiling of this cohort to further

explore the relationship between delirium, neurodegenerative disease, and cognitive outcomes. COMPASS-ND is establishing a series of longitudinal cohorts with comprehensive measures of clinical characteristics, neurological examinations, neuropsychology testing, blood and CSF biomarkers and MRI brain imaging. A delirium questionnaire based on DSM-5 criteria has been embedded in the COMPASS-ND protocol to enrich these measures by ascertaining delirium through a combination of structured telephone interviews with participants and caregivers and validated chart review techniques. This will allow us to: (1) estimate the period prevalence of delirium per neurocognitive subgroup; (2) understand how dementia biomarkers predict delirium occurrence; (3) quantify delirium as a predictor of disease progression.

Methods: The delirium questionnaire will be administered at the COMPASS-ND baseline and follow-up assessments. Although novel to assess for delirium in studies such as this, the current methodology depends on participant / caregiver understanding of delirium presentation, and relies on their recollection of events over a two-year time-frame. More intensive delirium case-finding will be piloted at Parkwood Institute in London, ON through a two-stage approach 1) more frequent telephone interviews with participants and caregivers to both administer the questionnaire and enquire about hospitalizations; 2) augmented case finding by chart review in those who had been hospitalized. The participants that are identified to have had delirium symptomology will have an expert assessment leading to a diagnosis of probable or possible delirium.

Results: In July 2014 a Clinical Cohort Working Group met monthly by teleconference (TC) to design a comprehensive clinical protocol. Since July 2015, the Platform Implementation Team has met weekly. The protocol includes clinical questionnaires, neurological examination, neuropsychology testing, blood and CSF biomarkers and MRI brain imaging. The 7 clinical cohorts include Subjective Cognitive Decline (244 for intervention trials in Toronto and Montreal and 56 from other sites) MCI (400), MCI with subcortical vascular lesions (200), mild dementia of mixed etiology (200), mild Alzheimer's Disease (150), Parkinson's Disease dementia spectrum (Lewy Body disease, Parkinson's dementia, MCI in Parkinson's disease) (200), frontotemporal disorder (FTD) (behavioural variant FTD, primary progressive aphasia, progressive subnuclear palsy and cortical basal syndrome) (200) for a total of 1600 participants. In addition, 660 normal elderly controls have been added.

Conclusion: To date 29 sites have completed signed agreements and contracts, and staff and have been initiated with a total of 32 sites anticipated. Over 900 participants have been recruited, with the largest group having MCI. Recruitment strategies are being implemented through TC's. COMPASS-ND Study is established, implemented and is actively recruiting.

Deprescribing of inappropriate medications among elderly people with advanced dementia - Preliminary results from the OptimaMed-LTC study

Edeltraut Kröger¹, Daniela Furrer¹, Mabelle Wilcheski², Michèle Morin³, Philippe Voyer³, Pierre-Hugues Carmichael¹, Nathalie Champoux⁴, Johanne Monette², Anik Giguère³, Michèle Aubin³, Pierre Durand³

¹ Centre d'excellence sur le vieillissement de Québec, CERSSPL- Université Laval

² McGill University

³ Université Laval

⁴ Centre de recherche de l'institut universitaire de gériatrie de Montréal

Background/Objectives: Long-term care (LTC) residents with severe dementia frequently receive multiple medications, including medications of questionable benefits. With the progression of the disease to severe dementia, a palliative care approach is indicated. Accordingly, medications should be reviewed, and, when necessary, deprescribed, because of reduced life expectancy or changes in their harm-benefit ratio. The aim of this controlled demonstration study was to evaluate the effects of an interprofessional intervention based on knowledge exchange (KE) sessions, medication review and interprofessional consultation to decrease the use of medications of questionable benefits among LTC residents in Quebec City.

Methods: A six-month intervention was implemented in four LTC facilities in the Québec City region (Centre intégré universitaire des soins et des services de santé de la Capitale Nationale) while three comparable LTCs facilities served as controls. Validated, published and pilot tested lists of « mostly », « sometimes » or « exceptionnellement » appropriate medications, tailored for LTC facilities were presented. The intervention consisted in : 1) information leaflets and user committee presentations for residents' families on optimal medication use in severe dementia; 2) two knowledge exchange (KE) sessions in each intervention facility for nurses, pharmacists and physicians; 3) medication review by pharmacists for each participating residents using the tailored lists; 4) discussion of the pharmacist recommended changes with nurses and physicians. Agitation and pain/discomfort levels of participants were evaluated using the CMAI and PACSLAC scales at study beginning and at the end of follow-up.

Results: Among 298 eligible residents in the 7 LTC facilities, the families of 120 (59 exposed, 61 controls) residents consented. The residents' mean age was 84.8 years and 78% were women; 27 residents died before the end of the 6-months follow-up; the mean Charlson comorbidity index was 7. At study beginning the mean number of used medications was 7.1 in the control and 7.7 in the intervention group. Levels of agitation and comfort were acceptable (mean CMAI =

37.3/203, mean PACSLAC-F =4.4/60) and did not change noticeably during follow-up. Analyses on changes in polypharmacy and medication appropriateness during follow-up are currently being completed.

Conclusion: This interdisciplinary intervention to deprescribe medications of questionable benefits for LTC residents with severe dementia was well received by the seven LTC facilities of the CIUSSS-CN. Still, less than half of contacted families consented for their loved-one to participate in the study; hopelessness was a common motive for refusal to participate. Medication use at study beginning was below published averages for Quebec LTC facilities, possibly reflecting recent efforts to reduce polypharmacy and use of psychotropics. Final results will be presented at the conference.

Using a new MRI Diffusion Tensor Imaging marker to predict cognitive decline in patients with Mild Cognitive Impairment

*Jena Whiteside, Eric Smith
Hotchkiss Brain Institute*

Background/Objectives: Mild Cognitive Impairment (MCI) often precedes dementia, but there is a need for stronger predictors regarding prognosis of individual patients. A promising new technique is an automated MRI DTI marker called peak width of skeletonized mean diffusivity (PSMD). While it is known that higher PSMD is associated with greater cerebral small vessel disease (SVD) burden, whether PSMD could predict future changes in cognitive test scores has yet to be investigated. This study's objectives were to (1) investigate relationships between baseline cognitive data and PSMD, and (2) determine if an association exists between higher PSMD and greater cognitive decline over time.

Methods: 60 patients were enrolled for MRI; 57 were used for data analysis as two did not tolerate MRI and one had no data due to a technical problem. Baseline cognition was assessed with a series of common cognitive tests (Mini-Mental State Exam, Trail Making Test Part A, Trail Making Test Part B, Digit Symbol Substitution Test, Rey-Osterrieth Complex Figure Test, and California Verbal Learning Test). Follow-up data was collected yearly for 1-3 years. PSMD scores were calculated using FSL software and the freely available toolkit found at www.psm-d-marker.com. Potential relationships between (1) baseline PSMD scores and baseline cognitive data, and (2) baseline PSMD scores and magnitude of cognitive decline over time were then assessed using Pearson correlations and linear mixed regression models.

Results: Graphically, higher PSMD scores appeared to be mildly correlated with lower memory, executive function, and processing speed Z-scores, but these relationships were found to be insignificant ($r=-0.19$, $p=0.16$; $r=-0.21$, $p=0.11$;

and $r=-0.08$, $p=0.57$ respectively). No significant relationship was present between PSMD and Mini-Mental State Examination (MMSE) scores ($r=-0.24$, $p=0.08$); however, a strong association was found between higher PSMD and higher normalized volume of MRI T2 white matter hyperintensities ($r=0.615$, $p<0.001$). Using linear mixed models to analyze follow-up data, the main effects of time were found to be insignificant with confidence limits crossing one, and there was no significant difference in rate of change over time according to PSMD.

Conclusion: We failed to find strong associations between baseline PSMD and baseline cognitive impairment. However, review of scatterplots suggested mild correlations between higher PSMD and lower scores on MMSE, memory, executive function, and speed that should be further explored with larger sample sizes. By showing a strong association between higher baseline PSMD and higher baseline WMH volume, we confirmed the finding of a previous study suggesting SVD causes higher PSMD. Analysis of follow-ups found no significant relationship between baseline PSMD and cognitive changes over time, suggesting that larger samples, more follow-ups, and higher SVD burden may be necessary to see associations.

Detecting apathy in individuals with Parkinson's disease: a systematic review

*Bria Mele, Daria Merrikh, Zahinoor Ismail, Zahra Goodarzi
University of Calgary*

Background/Objectives: It is estimated between 17-70% of individuals with Parkinson's disease (PD) have apathy. Individuals experiencing apathy in PD have a lack of emotion, passion, and motivation. These individuals have greater cognitive impairment, disease progression, and motor difficulties; caregiver burden is also amplified, as apathy may be difficult to understand. To address issues described within the literature surrounding how to best diagnose apathy, it was the objective of this research to examine diagnostic accuracy of apathy-screening tools compared with a gold standard (clinician diagnosis) among adult outpatients with Parkinson's disease (PD).

Methods: A systematic review was conducted. Six research databases were searched to May 23rd, 2018. Diagnostic accuracy measures, including sensitivity and specificity were gathered. Prevalence of apathy was also collected. Pooled prevalence of apathy was calculated using Mantel-Haenszel-weighted DerSimonian and Laird Models.

Results: 1,007 full-text articles were reviewed with seven full-text articles included. The gold standard was considered a clinician diagnosis as apathy is not defined in the DSM/ICD. Eighteen apathy-screening tools were identified, six of

which were validated. Diagnostic accuracy measures were reported for the Lille Apathy Rating Scale (LARS) both informant- and observer-rated, Unified Parkinson's Disease Rating Scale (UPDRS), Apathy Scale (AS), Apathy Evaluation Scale (AES), Non-Motor Symptoms Questionnaire (NMS-Q), and Dimensional Apathy Scale (DAS). The AES had the best reported sensitivity and specificity values, both 90%. The AS had the highest reported specificity at 100%, with 66% sensitivity. Pooled prevalence of apathy was 29.1% (95% CI 21.5%–36.6%). There was significant heterogeneity associated with this value ($I^2 = 79.6\%$; $p < 0.01$).

Conclusion: While 18 screening tools exist to screen for apathy in PD, only six have been validated against clinician diagnosis. The AES had the highest reported sensitivity and specificity and is a brief, easy to use tool. The AS was designed specifically for use in PD populations and has the highest reported specificity. Clinicians should review available and validated tools, and choose the one that best fits their practice. Future research should focus on the development of an accepted gold standard, to further understand accuracy measures of all available apathy screening tools.

Reducing workplace injuries through early identification and personalized care plans for patients with responsive behaviours due to dementia

Judith Anne Seary¹, Heather Bulley², Allison Diciacca², Julia Esseltine², Erin Gaiger², Ivana Jankovic², Stephanie Mackenzie³, Meghan McBride²

¹ McMaster University

² Hamilton Health Sciences

³ BSO (HNHB LHIN) / Hamilton Health Sciences

Background/Objectives: Ensuring staff safety is one element of a health system with a culture of quality. In Ontario's health care sector workplace violence has been identified as a high priority issue and a new mandatory indicator measuring the number of incidents of workplace violence has been added as a requirement for the 2018/2019 Hospital Quality Improvement Plans. This mandatory indicator is supported by an Ontario regulation that amends the 2010 Excellent Care for All Act. Patients are often identified after there has been a violent incident, rather than proactively. As a result, there continue to be workplace injuries incurred during the care of patients with dementia. 1) Improve the safety of frontline staff caring for patients at risk of violent behaviour due to dementia. 2) Anticipate the care needs of patients with dementia.

Methods: A quality improvement approach was taken to identify opportunities to reduce workplace injuries and to engage frontline staff on an acute general internal medicine inpatient ward. Prior to the project the majority of staff had completed Gentle Persuasive Approach (GPA) training. The project was led by an interdisciplinary group with representation from

Behaviour Supports Ontario (BSO), clinical education, geriatric medicine, nursing, occupational therapy, pharmacy, and physiotherapy. The first initiative undertaken by the group was to proactively identify patients at risk for violent behaviour by asking the reminder question "Is your patient in physical restraints?" at the daily morning safety huddle. A positive response to this question prompts the follow up question "Does your patient have or need a care plan or Interdisciplinary Team (IDT) meeting?". If a patient is identified as needing an IDT meeting to develop a care plan for responsive behaviours then one is scheduled. Documentation of care plans was standardized and entered into the electronic medical record. Baseline and ongoing workplace violence incidents were tracked using the monthly reports from hospital's safety occurrence report database. Periodic audits of medications commonly used for management of responsive behaviours were completed.

Results: The baseline rate of injury due to responsive behaviours was 2.5 incidents month (total 30 between October 2017 and September 2018). The change in approach to care planning began in October 2018. Between October 2018 and May 2019 there was an average of 2 incidents per month (16 incidents total, 5 during October while the program was starting, and 7 due to a single patient in March). Patients who were pre-emptively identified as at risk for violent responsive behaviours were involved in all of the incidents. During the same time period the number of referrals to geriatric medicine and BSO did not increase. Follow up discussion with frontline staff indicated increased comfort with developing care plans and a sense of empowerment.

Conclusion: Care plans developed and implemented by frontline staff can reduce the rate of injury due to responsive behaviours.

Developing a RAI-MDS 2.0 behavior-based pain assessment scale for long-term care residents with advanced dementia

Jennifer A. Knopp-Sihota¹, Mathias Hoben², Jeffrey W. Poss³, Geoffrey S. Rachor², Carole A. Estabrooks²

¹ Athabasca University

² University of Alberta

³ University of Waterloo

Background/Objectives: In Canadian and many international long-term care (LTC) facilities, pain assessment frequently relies on data from the Resident Assessment Instrument – Minimum Data Set 2.0 (RAI-MDS). The RAI-MDS produces a two-item scale, measuring both pain frequency and pain intensity. This scale correlates well with self-reported pain in cognitively intact LTC residents, but despite repeated testing, is less valid for use in residents with more advanced cognitive impairment who are unable to self-report their pain. In this study we aimed to develop and validate a behaviour-based

pain assessment scale for long-term care residents using data available in the RAI-MDS.

Methods: To construct our initial scale, we reviewed the literature and compiled a list of observable indicators of pain (e.g., grimacing) and linked these with 28 similar items available in the RAI-MDS. Using Delphi techniques, we further refined this to 20 items. We then evaluated the psychometric properties of our scale using two independent, representative samples, of urban LTC residents in Western Canada. Exploratory factor analyses were conducted in sample one (n=16,282) and confirmatory factor analyses (CFA) were then conducted in sample two (n=15,785) in order to test, and confirm, our model.

Results: two-factor solution was identified grouping RAI-MDS items into subscales 1) change in status (e.g., new onset restlessness) and 2) behaviours (e.g., crying). Commonly recognized model fit indices were acceptable suggesting the adequacy of the two-factor solution.

Conclusion: Results provide preliminary support for the use of behavioural-based pain assessment scale using RAI-MDS data. Further evaluation and validation of our scale is warranted.

Experiences of Immigrant Seniors and Dementia Care in Canada: A Scoping Review

Ngozi Iroanyah
York University

Background/Objectives: Since 2011, the senior population of 65+ has outpaced the population of 0-14 years, 5.9 million compared to 5.8 million. Immigration patterns also differed from previous years. In 2016, 1 in 5 Canadians, identified as foreign born. By 2036, 24.5% to 30% of Canadian population estimates could be foreign born. Asia, for the 2nd time, was the primary continent source, and Africa, for the 1st time, was the secondary source continent for immigrants, these trends will have implications on the makeup of senior population into the 2030's, 2040's and 2050's and beyond. Dementia remains a prominent health concern. Statistics approximate 564,000 people live with the disease in Canada, with that number

expected to rise to 937,000 by 2031. Prevalence rates more than double every 5 years, from < 1% for 65-69 years, to > 25% for those 85+. This scoping review aims to find out what is known about the experience of ethno-racially immigrant seniors and dementia care services in Canada. This review will add to the growing literature on this population and help identify gaps in care and understanding that can be used to target more inclusive dementia care policy and programming.

Methods: This review follows the methodological framework of scoping studies as outlined by Arksey and O'Malley and centers on the question: What is known about the experience of ethnoculturally diverse immigrant seniors and dementia care services in Canada? The search strategy was conducting using the electronic databases of Google Scholar, Pubmed (including Medline) and the York University Library system. To obtain access to government documents provincial government Ministry of Health websites were also consulted, though no government publications were used. 35 abstracts were selected that mentioned any one of the key search words and were published between 2008-2019. Of these 35, 7 were duplicates and discarded. The remaining 18 abstracts were further reviewed and screened for applicability using the inclusion/exclusion criteria. Of these 18, 8 focused exclusively on general adult immigrant populations and was not able to provide insight in to the experiences of older adults. 10 full text articles were finalized for review and included in the study. There were no additional searches generated from the reference lists of the included articles. All included articles were sourced for publicly accessible databases, to mitigate against costly fee for service databases.

Results: The findings were organized into 3 main themes: 1. Culture and Language as main barriers to dementia services. 2. Barriers to adequate healthcare access and services. 3. Current paradigms of health and wellness and impact on health status.

Conclusion: This scoping review revealed a great paucity of research on the dementia experience for ethnic minority older immigrant adults in Canada, alongside the established and growing literature on immigrant mental health. The resulting impact is that more intersectional research is needed to include the lived experiences of ethnic minority older immigrant adults within dementia care to optimize health status.