Abstracts from the 11th Canadian Conference on Dementia

Better and Earlier Detection of Dementia in a Changing Landscape; November 2 – 4, 2023; Toronto, Ontario

https://doi.org/10.5770/cgj.27.736

Bridging Academia and Community to Support People Living with Dementia and Their Care Partners

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Background/Objectives: As age-related diseases such as dementia increase, care is moving from hospitals into homes, and family care partners are at the centre of a crisis. There is a need to bridge academia and the community, and more specifically to make medical and other healthcare students aware of the impact of dementia on persons living with the illness as well as the impact on their care partners. Universities can play a very important role in providing post-diagnosis dementia education and support to the community. The McGill University Dementia Education Program was founded in 2017 by Claire Webster, a former care partner.

Methods: The program offers a comprehensive range of free resources and cutting-edge teaching and learning techniques, including simulation to educate and support persons living with dementia, family and informal care partners, healthcare professionals, medical students and the public at large. Among the many resources on our website; a Dementia Companion Guide available to download in 10 different languages with many more translations in development, "McGill Cares" webcast series consisting of close to 100 educational webinars and podcasts featuring leading healthcare experts, virtual support groups for care partners including "young carers", and an online education program to be launched in the Fall of 2023 for care partners. McGill University has also fully embraced the "person/patient centred care approach" into its medical curriculum by making it mandatory for all first-year medical students to attend Claire Webster's lecture on "Navigating the Journey of Caring for a Person Living with Dementia".

Results: Within only 5 years of its inception, the McGill University Dementia Education Program has reached thousands of care partners and has received national and international recognition, becoming one of the most successful community outreach programs within McGill University's Faculty of Medicine and Health Sciences, raising over $4 million in funding. In May of 2019, the program was recognized at Quebec's National Assembly by MP Jennifer Maccarone for educating citizens on the reality of caring for a person with dementia. In June of 2019, the program was awarded Gold in the category of Best Community Outreach Initiative by the Canadian Council for the Advancement of Education. In December of 2020, the Academic and Medical Directors of the program were selected by Alzheimer's Disease International to write the 2021 and 2022 World Alzheimer's Reports on the inter-related topics of diagnosis and post-diagnosis management.

Conclusion: Universities can play a critical support role, bridging academia and community to provide service to society. They can institute community outreach programs that leverage the wealth of expertise within their institution, and they can integrate caregiver awareness and education into their medical school curriculum.

My Personhood Summary©: An Updated Biographical Summary Tool to Support the Provision of Person-Centred Care to People Living with Dementia and Geriatric Mental Health Conditions

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Background/Objectives: Gaining insight into individuals' life experiences, important connections, individual preferences, and other psychosocial and environmental factors is crucial in delivering person-centered care. From the beginning of Behavioural Supports Ontario (BSO), teams have embraced different biographical summary tools to uncover this information and apply it in caring for individuals with dementia, complex mental health issues, substance use disorders, and other neurological conditions. In response to the demand for a standardized BSO biographical summary tool, we established a working group to enhance an existing tool called PIECES of my PERSONHOOD and broaden its application.

Methods: To begin with, we conducted an extensive examination of 15 biographical summary tools specifically designed for the BSO population. Through a content analysis, we identified the most commonly included elements. Drawing upon the valuable insights from our working group, which consisted of professionals and individuals with firsthand experience, we created multiple drafts. These drafts were then reviewed by healthcare providers and individuals with lived experience. Subsequently, the final draft tool was tested at thirteen pilot sites across long-term care, community, and hospital settings. Valuable feedback was collected from these pilot sites through surveys, which played a crucial role in refining both the content and design of the tool.

Results: In October 2022, we officially launched the finalized version of the tool, now named My Personhood Summary©. This comprehensive tool spans two pages and is available in both English and French. It can be easily downloaded free of charge as a fillable PDF and Microsoft Word Fillable Form. To facilitate its effective implementation, we have also provided accompanying guidelines for usage, completed examples, and a poster template. These additional resources serve as valuable aids in incorporating the tool into practical settings. Within the initial four months of its release, the tool received a total of 823 downloads. Among these downloads, nurses accounted for 34%, managers accounted for 9%, and personal support workers accounted for 9%. The remaining downloads were distributed among various other disciplines and roles.

Conclusion: Personhood is vital when caring for individuals with dementia and other geriatric mental health conditions as it recognizes their humanity and unique experiences. The My Personhood Summary© Tool facilitates person-centered care by providing a comprehensive biographical summary, including life history, relationships, and preferences. It empowers healthcare providers to tailor their approach, promote engagement, and create a supportive environment for individuals, enhancing their well-being and quality of life.

Evaluating an Introductory E-Learning Module About Sexuality and Dementia

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Background/Objectives: Many healthcare providers (HCPs) apply personal values and beliefs to make sense of the sexual expressions of people living with dementia; while doing so, they run the risk of labeling these expressions as pathological and/or inappropriate. Without an understanding of evidence-based approaches, HCPs may stigmatize people living with dementia, separate them from peers, and administer unnecessary medications. Challenging these harmful practices requires HCPs to increase their knowledge, expand their skillset, and change their perceptions of the sexual and intimacy needs of people living with dementia.

Methods: To promote positive practice change, we developed a free e-module, Dementia, and Sexuality: An Introduction. This e-module employs four narratives, which underscore the importance of diversity, 2SLGBTQ+ representation, and communication. While engaged with the narratives, HCPs are invited to consider how people living with dementia express their unmet sexual and intimacy needs, and how they may work collaboratively to address such needs.

Results: We invited learners, who accessed the e-module from November 2021 to May 2022, to participate in pre-and post-surveys, during which they voluntarily evaluated the content and design of the e-module. From the total sample size (n=507), we matched pre- and post-survey data for 280 participants, revealing statistically significant improvements in self-efficacy ($p<0.001$). We also identified that learner satisfaction with the e-module (measured out of 5) was high, with an average score of 4.62.

Conclusion: We will draw from the results of the evaluation to inform our efforts in developing subsequent e-modules, which will be available in 2024.

Facilitating Person-Centred Transitions Across Sectors Using 'My Transitional Care Plan'

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Background/Objectives: The process of transitioning individuals with dementia and geriatric mental health conditions between care settings poses significant risks due to complex illnesses and inadequate information exchanges. The COVID-19 pandemic further exacerbated these challenges. To address this, the Behavioural Support Integrated Teams (BSIT) Collaborative developed 'My Transitional Care Plan during the COVID-19 Pandemic' (MTCP-C19) in October 2020. Recognizing the ongoing value of the tool, the BSIT Collaborative re-adapted MTCP-C19 into a broader version, known as 'My Transitional Care Plan' (MTCP).

Methods: The re-adapted version of MTCP was trialed in seven pilot sites across Ontario in the summer of 2022. Feedback was collected from healthcare providers and care team members involved in the transitions using a survey. Additionally, input from the BSIT Collaborative informed edits to the tool and its guidelines. Following the finalization of the re-adapted tool, additional products were created to support its implementation, such as guidelines for use and completed examples.

Results: MTCP is an effective tool for supporting transitions across sectors of individuals with dementia and geriatric mental health conditions. Feedback from healthcare providers and care team members indicated that MTCP improved information exchange, coordination of care, and continuity of support during transitions. The tool was found to be user-friendly and adaptable to various care settings. The availability of resources supporting MTCP implementation, such as guidelines for use and completed examples, further enhanced its usability.

Conclusion: MTCP enhances information exchange, coordination of care, and continuity of support, ultimately improving efficiency, staff communication, and patient outcomes. The availability of accompanying resources further facilitates its implementation. These results support the broader adoption and implementation of MTCP across care settings, providing a standardized approach to person-centered care during transitions. Continued efforts to disseminate MTCP and provide ongoing support and education for healthcare providers and care teams are crucial for maximizing its benefits and ensuring optimal outcomes for individuals transitioning between care settings.

The Potential of Social Policies in Preventing Dementia: An Ecological Study Using Systematic Review and Meta-Analysis

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Background/Objectives: Low everyday stress level, better cardiovascular health, more advanced education, cognitively demanding job/leisure activities, and social connectedness are acknowledged as protective factors against dementia. However, the exposure to individual protective factors is unequal across societies due to the differences in their political and social backgrounds. In countries with more progressive social policies, people face less stress caused by difficulties in meeting basic needs, better access to primary healthcare is associated with better cardiovascular profiles, less inequality in income and gender demonstrated more egalitarian access to competencies and education and a more diverse and secure social life.

Methods: Objective: This ecological study using systematic review and meta-analysis, explores the associations between indicators of social policies on social security, access to healthcare, income and gender inequality in OECD countries, and the resilience to AD dementia (ADw/oD). We estimated this association in an ecological study using systematic review and meta-analysis. ADw/oD was defined as death without dementia in people with clinically significant AD brain pathology. The indicators of social policy were extracted from the Organisation for Economic Co-operation and Development statistical database (OECD). The pooled prevalence of ADw/oD and its association with social policy indicators is assessed in the three-level meta-regression analytical model.

Results: Out of 1993 abstracts screened, 18 studies were retained for the final analysis. Nearly fourty percent (39% (25% - 53%)) of donors who died without dementia had moderate AD brain pathology during their lives. The heterogeneity was as high as Q= 170.5(p-value< .001), with 77% of the total variance of true prevalence attributable to the difference at the country level. The probability of ADw/oD with moderate AD brain pathology was inversely associated with the Gini index for disposable income, poverty rate, and certain public expenditures on healthcare. A small portion, 8%(4% - 13%), of brain donors with advanced AD brain pathology had no dementia at the time of death. The heterogeneity was as high as Q=254(p-value< .0001), with no total variance of true prevalence attributable to the difference at the country level. The expenditures for long-term care were the only social policy indicators

Conclusion: Social policies may play a pivotal role in maintaining and sustaining of cognitive health of older people with moderated AD pathology.

The Dynamic Model of Health Assets for Cognitive Health of Older Adults: A Secondary Analysis of the Longitudinal SHARE Data.

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Background/Objectives: Recent literature emphasizes the importance of studies on protective factors against dementia. Some of them are already described (lifestyles, personality traits, etc.). Meanwhile, there is no theoretical model to consider the complexity of interaction between them and their wider contexts. The Dynamic model of health assets connects circularly individual traits, actions, environments, and social support (informal, from family and friends, and institutionalized, from social policies). Each previous component contributes to the following and directly to the "positive cognitive health" (brain resistance and resilience). This study evaluates the independent contribution of Model component in predicting positive cognitive health among older adults.

Methods: Participants of the Survey on the Health, Aging, and Retirement in Europe, Waves 5 (2013) and 7 (2019) were included in analyses. The dependent variable ("Positive cognitive health") was operationalised for cross-sectional analysis as six or more words recalled of the 10-word delayed recall test at baseline. For the longitudinal analysis, positive cognitive health was operationalized as six and more recalled word both at baseline and at follow-up. Personality traits, activities (directed to the "better me" or the "better world"), neighborhood characteristics (cleanness, walkability, proximity of essential services), and social support (given, received; the institutionalized social support was approximated by the country of residence) presented health assets. Two series of multilevel logistic regression (cross-sectional and longitudinal) were constructed with the expectation that the addition of health assets in the model, including already socio-demographic and risk variables, would improve the model's explicative/predictive value.

Results: The study included 66,065 participants; out of them, 41,475 completed the follow-up. After applying the inclusion criteria, 28,948 were aged between 60 and 85 years old remained, and 25,091 had complete information. Country of residence, age, gender, and social class explained 14% and 30% of the variability in cognitive health cross-sectionally and longitudinally. The inclusion of risk variables lightly improves the model's explicative and predictive capacities: up to 16% in the cross-sectional and up to 31% in the longitudinal models. The model including assets and risk factors for dementia explains more variability in cognitive health than the model only including socio-demographic and risk variables, both cross-sectionally and longitudinally. Cross-sectionally, including assets variables improves the pseudo-R-square from 16% to 18% and the area under the ROC curve from 72.3% to 73.9%. Longitudinally, the pseudo-R-square increase from 0.31 to 0.33, and the area under the curve (AUC) increases from 77.8% to 79.5%.

Conclusion: Information on health assets in the models of positive cognitive health is at least equally important as the information on dementia risk factors. The Dynamic model of health assets is more helpful for the longitudinal modeling of positive cognitive health. It may be used in predicitve models in further research. However, further research is needed to better understand the relationships between the Model's components and to refine the operationalization of it concepts.

Social Class and the Risk of Dementia: A Systematic Review and Meta-Analysis of the Prospective Longitudinal Studies

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Background/Objectives: People of higher social standing have better access to education, cognitively demanding occupations, and complex leisure activities. In addition, they experience less chronic stress due to better access to housing and healthcare. Finally, their living places show less air, noise, and light pollution and higher greenness and walkability. The combination of these factors results in a lesser risk of dementia, as documented in several individual studies. However, a meta-analysis of these studies has yet to be performed. In the present work, we sought to summarize the results of prospective, longitudinal studies on this topic.

Methods: We conducted a systematic review and meta-analysis of prospective, longitudinal studies measuring the association between indicators of social class and the risk of all-cause/Alzheimer's dementia. The search was conducted in four databases (Medline, Embase, Web of Science, PsychInfo). Criteria for inclusion in this systematic review and meta-analysis were: (1) longitudinal prospective study; (2) age 60 years and more at baseline; (3) issued from the general population; (4) no dementia at baseline; and (5) mention of social class as exposure. Exclusion criteria are as follows: (1) study of rare dementia types (ex.: frontotemporal dementia); (2) abstract-only papers; (3) articles without full text available. The Newcastle-Ottawa scale was used to assess the risk of bias in individual studies. We calculated the overall pooled relative risk of dementia for different social class indicators, both crude and adjusted for sex, age, and the year of the cohort start.

Results: Out of 4,548 screened abstracts, 15 (76 561 participants, a mean follow-up of 6.7 (2.4 - 25) years, the mean age at baseline was 75.1 (70.6 - 82.1), the mean percentage of women was 58%) were included in the final analysis. Social class was operationalized as levels of education, occupational class, income level, neighborhood disadvantage, and wealth. Education (RR=2.48 (CI: 1.71, 3.59)) and occupational class (RR=2.09 (CI: 1.18, 3.69)), but not income (RR=1.28(CI: 0.81, 2.04)) were significantly associated with the risk of dementia in the adjusted model. Some of the limitations of this study are the inclusion of studies predominantly conducted in high-income countries and the exclusion of social mobility in our analysis.

Conclusion: We conclude that there is a significant association between belonging to a social class and the risk of dementia, with education and occupation being the most relevant indicators of social class regarding this risk. Studying the relationship between belonging to a disadvantaged social class and dementia risk might be a fruitful path to diminishing the incidence of dementia over time. However, a narrow operationalization of social class that only includes education, occupation, and income may reduce the potential for such studies to inform social policies.

The Impact of the Early Waves of the COVID-19 Pandemic on Acute Care Service Use and Mortality Among Persons Living with Dementia in Canada

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Background/Objectives: The COVID-19 pandemic has disproportionately affected persons living with dementia (PLWD), with higher risk of severe illness and death. The indirect effects of the pandemic included increased adoption of telehealth, decreased access to medical and community services, and social isolation. We estimated the overall impact of the first two waves of the COVID-19 pandemic on all-cause acute care use and mortality among community-dwelling PLWD and those residing in long-term care (LTC) homes in Canada.

Methods: We conducted cross-provincial exploratory meta-analyses using administrative databases from Ontario, Saskatchewan, Alberta, and Quebec. We identified retrospective cohorts of PLWD on March 1, 2020 (pandemic) and March 3, 2019 (pre-pandemic). We stratified cohorts as community and LTC populations. We measured rates of emergency department (ED) visits, hospital admissions, intensive care unit (ICU) admissions, and mortality outcomes in the three following pandemic periods: first wave (March-May); interim period (June-August); second wave (September-December) and compared patterns with corresponding pre-pandemic periods. We adopted a two-step meta-analytic approach. In step 1, we estimated incident rate ratios [IRR (95%CI)] with a generalized estimating equation negative binomial model (2020/2019). In step 2, we performed random-effects meta-analyses on the province-specific pre-calculated effect estimates.

Results: Pre-pandemic and pandemic cohorts included 167,095 vs. 173,240 (community) and 93,374 vs. 92,434 (LTC) individuals. In community population, acute care visits were generally lower throughout the first year of the pandemic: ED visits during both waves (0.64 [0.59,0.69] and 0.60 [0.39,0.92]); hospitalizations during the first wave (0.75 [0.59,0.95]) and interim period (0.83 [0.70,0.97]); and ICU admissions during the interim period (0.74 [0.62,0.89]) and the second wave (0.75 [0.74,0.77]). Mortality was lower during the interim period (0.83 [0.71,0.97]) and higher during the second wave (1.10 [1.04,1.16]) among community population. In LTC, we found lower ED visits (0.60 [0.39,0.92]) and hospitalizations in the first wave (0.78 [0.66,0.91]) and lower ICU admissions throughout the three pandemic periods. Mortality was higher during the first wave (1.36 [1.00,1.84]) among LTC population.

Conclusion: During the first pandemic year, many health sectors were impacted in Canada. While PLWD in community experienced less ED and hospital utilization throughout the year, first wave reduction was significant in LTC. Higher mortality in both LTC and community may be due to COVID-19 breakouts. Our findings underscore that health authorities must have contingency plans for future health public emergencies while sustaining accessible and equitable healthcare services for PLWD under regular circumstances.

Mild Behavioral Impairment-apathy and Alzheimer's Disease-related Biomarkers

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Background/Objectives: Apathy is amongst the most common neuropsychiatric symptoms in Alzheimer's Disease (AD) dementia, but it can also manifest in individuals who are cognitively normal (CN) and who have mild cognitive impairment (MCI). Apathy is associated with accelerated progression to AD, and apathy in AD is associated with lower quality of life, greater caregiver distress, and higher morbidity and mortality. The goal of this study was to identify emergent and persistent apathy, known as mild behavioral impairment (MBI)-apathy, in non-dementia samples and combine this syndrome with AD-biomarkers, including beta-amyloid (Aβ), phosphorylated tau (p-tau), and total tau (t-tau), to better predict AD dementia.

Methods: Dementia-free participants in the Alzheimer's Disease Neuroimaging Initiative (ADNI) were stratified as MBI-apathy and no neuropsychiatric symptoms (no-NPS) based on Neuropsychiatric Inventory (NPI) and NPI-Questionnaire (NPI-Q) scores at two consecutive visits. Covariates of interest included age, sex, apolipoprotein ε4 (APOE ε4) carriership, years of education, Mini Mental State Examination (MMSE) score, and the questionnaire NPS status was derived from. Linear regressions assessed the association of MBI-apathy (predictor) with Aβ40, Aβ42, p-tau181, t-tau, Aβ40/Aβ42, p-tau181/Aβ42, and t-tau/Aβ42 (outcome variables). We also used linear mixed effect models for repeated measures to investigate change in our outcome variables across a two-year period. All covariates of interest previously mentioned as well as apathy total between scores and apathy total within scores made up the fixed effects for the model while participant ID numbers made up the random effects for the model.

Results: Of the 253 participants (127 CN); 51 had MBI-apathy. MBI-apathy was found to be significantly associated with baseline p-tau181/Aβ42 ($p<0.05$) and t-tau/Aβ42 ($p<0.05$) ratios. MBI-apathy was also found to be significantly associated with changes in Aβ42 ($p=0.001$), Aβ40/Aβ42 ($p<0.01$), p-tau181/Aβ42 ($p=0.001$), and t-tau/Aβ42 ($p=0.001$) levels and ratios over two-years.

Conclusion: To our knowledge, this is the first study examining the relationship between MBI-apathy and AD-related biomarkers. Results suggest that MBI-apathy is significantly associated with several AD-related biomarkers both cross-sectionally and longitudinally. Combining the presence of persistent and emergent apathy with these biomarkers might serve as a prognostically useful approach for predicting AD dementia at a time when there is opportunity for intervention.

The Association Between Mild Behavioral Impairment-apathy and Cognitive Impairment

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Background/Objectives: Apathy may appear as a less acute and impactful neuropsychiatric symptom (NPS) in neurodegenerative disease, however it contributes to several adverse outcomes for patients. Apathy in non-dementia individuals is associated with accelerated progression to dementia, and apathy in dementia is associated with lower quality of life and higher morbidity and mortality. The multitude of negative outcomes associated with apathy highlight the importance of research whose primary goal is to investigate the association between apathy and cognitive impairment to inform the development of more effective and targeted interventions while also enhancing the quality of life for older adults affected by apathy.

Methods: All participants enrolled in the Canadian Platform for Research Online to Investigate Health, Quality of Life, Cognition, Behaviour, Function, and Caregiving in Aging who had complete MBI-Checklist (MBI-C) scores were eligible. Total apathy severity was measured by summing all six MBI-C apathy domain severity related items. Cognitive behavioural, and emotional apathy severity was measured by summing the first and second, third and fourth, and fifth and sixth MBI-C apathy-related items, respectively. Everyday cognition was measured by summing all ECog severity scores. Negative binomial regressions assessed the association between total, cognitive, behavioural, and emotional apathy severity with everyday cognition severity. Covariates included age, sex, years of education, and non-apathy MBI (affective dysregulation, impulse dyscontrol, social inappropriateness, psychosis) severity.

Results: 953 participants were included in this study. As hypothesized, greater MBI-apathy severity was found to be significantly associated with greater cognitive impairment ($p<0.001$). Exploratory analyses revealed that greater cognitive ($p<0.01$) and behavioural ($p<0.001$) apathy severity were also significantly associated with greater cognitive impairment. There appeared to be no association between emotional apathy and cognitive impairment.

Conclusion: To our knowledge, this is the first study to examine the relationship between MBI-apathy and the syndromic apathy domains with cognitive impairment. Results suggest that even after adjusting for severity in the other four MBI domains, total apathy and two of the syndromal apathy domains still remained significantly associated with cognitive impairment. These findings provide valuable insight into the complex interplay between apathy and cognitive function, with potential implications for the development of targeted interventions to enhance the quality of life for those affected by apathy-related cognitive deficits.

Home-based Exercise in Primary Progressive Aphasia: The Protocol of a Pilot Study

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Background/Objectives: Research shows that physical activity induces neuroplastic changes in older age and exerts a protective effect against cognitive decline. Despite several intervention studies on physical activity in patients with Alzheimer's disease, the benefits induced by exercise during the process of atypical neurodegenerative disorders, like Primary Progressive Aphasia (PPA), have not been investigated. The current pilot study aims to evaluate the feasibility of a home-based exercise intervention in adults clinically diagnosed with any of the three main variants of PPA (semantic, non-fluent/agrammatic or logopenic).

Methods: A total of 12 participants will be recruited through McGill University's Douglas Research Institute and will complete a 6-month home-based multimodal intervention program. They will train two to three times a week for 45 minutes and be supervised via videoconference by a kinesiologist from the EPIC Center at the Montreal Heart Institute. If desired, participants will be accompanied by a close friend or relative to facilitate communication, especially if they have difficulty understanding instructions or expressing themselves. To assess changes in cognition, physical and psychological functions, participants will complete neuropsychological and functional assessments in-person at baseline. These assessments will also be completed at three and six months post-intervention.

Results: The feasibility outcomes will be available during the summer of 2024 and will be based on: 1) total recruitment and recruitment rate, 2) program completion rate, 3) compliance and 4) participants' ability to train at home with or without a caregivers' presence.

Conclusion: The knowledge gained from this pilot project will be used to assess the feasibility of a full randomized control trial aimed at assessing the effects of multimodal exercise intervention in PPA patients. Ultimately, an increased understanding of the potential beneficial effects of physical exercise in PPA will allow for more tailored rehabilitative approaches in this clinical population.

Environmental Scan of Available Services for Older Adults Living in and Around Four Rural Memory Clinics, and the Experiences of Service-Users

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Background/Objectives: As part of a larger study, and in collaboration with rural primary care teams, RaDAR (Rural Dementia Action Research) rural primary care memory clinics (RMCs) have evolved and continue to spread in communities across southeast Saskatchewan. This study focuses on the geographical areas of the four communities where RMCs were first developed and implemented, and the available services and supports available to RMC patients/families living in these areas. Our goal was to identify and describe existing programs and gaps, create inventories/maps, and describe the program and service experiences of family caregivers and people living with dementia (PLWD) in these areas.

Methods: Using a mixed methods design, an environmental scan of services was conducted from December 2020 to April 2021 using focus groups (n=4) with health care providers/managers (n=12), a secondary source (i.e., program brochures) review, and a systematic internet search targeting RMC communities and surrounding areas via community websites, online resources, and the 211 Saskatchewan service database. Data were then analyzed using content analysis; findings informed semi-structured interviews with caregivers (n=5) conducted from March to July 2022, which were analyzed thematically. Geographic areas explored in this study covered an area of approximately 5666 km2.

Results: From the scan, 43 services were identified, categorized into 7 service types, and mapped by location. Most were social/leisure activities (n=14), then general support/referrals (n=13), transportation (n=7), information/education (n=4), respite (n=2), in-home care (n=2), and safety (n=1). Service levels included local (n=24), provincial (n=17), and national (n=2), and were offered in-person, remotely (or both) with 20 services across 4 service types offered remotely. 17/43 services were dementia-related. In general, most services involved no fees, were accessed by referral by self/other, and providers had a range of education/training. Key interview themes reflected the need for locally available, accessible services that offer i) individualized, needs-based approaches, and continuity of care, ii) flexible in-home care options, and iii) both formal and informal supports. Gaps in services and recommendations to address gaps are reported and discussed. In general, service providers were more often female, program participants were mixed, and program content was gender neutral.

Conclusion: Findings show a range of available services, and a number of varied service-user experiences, in these areas. Key service gaps were identified, and recommendations were made by health care professionals and caregivers of PLWD. Findings may inform future service delivery, interventions, and improve local program participation.

Outdoor Based Support for People Living with Dementia: An Exploratory Study

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Background/Objectives: This paper reports on the potential of outdoor based support and care for people living with dementia from the perspectives of people living with dementia, their care partners and older adults, and organizations providing outdoor based or recreation and social support to people living with dementia. This work addresses both a policy and practice concern about how to best provide support to people living with dementia in the future as well as a gap in knowledge about alternative forms of care and support to the day care or senior care models of care that are largely provided indoors in Canada.

Methods: Data collection with two participant groups, 1. older adults, people living with dementia and care partners and 2. organizations providing outdoor, recreation or social programming, took place between January and June 2023. 37 participants from participant group 1 (people living with dementia (PLWD) n =15, care partners (CP) n=9 and older adults (OA) n=13) took part in one of six focus in South West Ontario. Two outdoor based walking focus groups were conducted with 17 PLWD/CP/OA participants. The second participant group comprised 39 participants, 17 participated in one of four focus groups and 12 participants took part in 1-1 interviews. All focus groups, other than the walking focus groups where field notes were used, were audio-recorded and fully transcribed verbatim. A thematic analysis, within and across each participant group datasets, was conducted following Miles et al.'s (2014) phases of: i data condensing, ii. data display iii. drawing conclusions.

Results: We will share our key thematic findings. First we will draw attention to the different issues emerging from organizations and those raised by people living with dementia/care partners/older adults. Namely, organization specific themes of; Understandings of outdoor based care; and Program development and implementation considerations; and perspectives of people living with dementia, care partners and older adults relating to two broad thematic areas: Suggested possible outdoor based activities and Challenges to participating in outdoor based activities. We will also share the perspectives of outdoor walking focus groups participants and the 2 key themes of Positives of participating in the outdoor experience; and Ideas to improve outdoor based activity experiences. We will consider the four common themes across both participant groups: Challenges of achieving full participation in outdoor based activities; Perceived physical, social and mental health benefits of outdoor activities; Stigma/concerns about disclosing a dementia diagnosis and; Overcoming perceived risks.

Conclusion: This study presents our analysis of an investigation of outdoor based support and care and support for people living with dementia in Canada. It aligns with the World Health Organization focus on dementia as a public health priority requiring creative approaches to provide high quality support and care. It has implications for our academic knowledge as well as care policy and practice relating to the promotion of (social) health and wellbeing for people living with dementia.

Education Needs of Canadian Physiotherapists Working with People Living with Dementia: An Online Survey

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Background/Objectives: Physiotherapy for people living with dementia (PLWD) can improve mobility and maintain independence. The Dementia Strategy for Canada (2019) included the goal to develop a skilled healthcare workforce in this area. Research from other countries has identified lack of educational opportunities, negative attitudes and low confidence among healthcare professionals working with PLWD. Therefore, it is important to identify the knowledge, confidence and impact of dementia on rehabilitation practices among physiotherapists to identify barriers and facilitators to care delivery. The objective was to evaluate the knowledge, confidence and education needs of physiotherapists in working with PLWD.

Methods: An online survey in English or French was completed by physiotherapists registered to practice in Canada. Data were collected on demographics, training experience in dementia, Confidence in Dementia Scale (Elvish et al. 2014), Dementia Knowledge Assessment Scale (DKAS) (Annear et al. 2015), Impact of Cognitive and Behavioural Symptoms on Physiotherapy Treatment (Staples & Killian 2012) and strategies for cognitive and behavioural symptoms (McGilton et al. 2007). Descriptive statistics were used to summarize the survey responses.

Results: 130 physiotherapists completed the survey (age=39.8(10.7) years and 12.5(11.0) years of practice). Knowledge of dementia was 60% on the DKAS, with sub-scores of 60% in causes and characteristics, 67% for communication and behaviour, 50% for care considerations and 65% for risks and health promotion. Confidence in working with people with dementia was 67.4%. Education on dementia and working with PLWD was reported by 55% during entry-to-practice training and 65% after graduation. Only 47.3% reported being satisfied their training was sufficient. Training was reported as sufficient by 60.3% in mild dementia, 49.6% in moderate dementia and 29.2% for severe dementia. People reported they had strategies to address behavioural symptoms for anxiety (67%), agitation (61%), and aggression (49%). People reported they had strategies to address cognitive symptoms for memory problems (79%), decreased initiative (62%), lack of insight (52%) and language impairment (50%). Overall, 59.7% reported good job satisfaction in working with PLWD.

Conclusion: The study found confidence and job satisfaction was fair overall. Education needs included knowledge of dementia and rehabilitation strategies for addressing behavioural and cognitive symptoms that can be employed across disease severity. Education to build confidence and competence needs to begin in entry-to-practice training and be available in post-professional courses. Providing optimal physiotherapy care to PLWD will pose serious challenges for healthcare providers if their training has not prepared them for the unique challenges and opportunities for working with PLWD. This study will inform the development of education content for physiotherapy students and physiotherapists working with people living with dementia.

Resting State EEG Abnormalities in Alzheimer's Dementia and their Relationship with Cortical Excitability

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Background/Objectives: Previous literature have identified slowing of resting state electroencephalography (rsEEG) rhythm and abnormal cortical excitation in Alzheimer's Dementia (AD). However, the relationship between these two divergent functional abnormalities are not well understood. Objectives: (1) To compare resting state EEG spectral power between AD and healthy controls (HC). (2) To examine the relationship between resting state EEG power and cortical excitability.

Methods: Resting state EEG signal was recorded in participants with AD and HCs for 5 minutes with eyes closed. Relative resting state EEG power was measured for the five frequency bands. Participants underwent a single pulse transcranial magnetic stimulation (TMS) combined with EEG. Cortical evoked activity (CEA) was assessed using TMS-evoked potential (TEP) rectified area under the curve (AUC) from 25 to 80 ms post-TMS stimulus.

Results: Compared to 32 HC (18 females; mean ± SD age: 69.3 ± 7.9 years), 52 participants with AD (32 females; 74.2 ± 8.5 years) had higher relative theta power of than HC ($t(66.6) = 5.34$, $p<0.001$). AD participants also had a significantly lower alpha power ($t(76) = -3.03$, $p=0.003$) and beta power ($t(76) = -2.51$, $p=0.014$) than HC. Controlling for sex, age and years of education, AD participants showed a positive correlation between theta power and CEA (rpartial=0.573, $p=0.008$); and a negative correlation between alpha power and CEA (rpartial=-0.471, $p=0.036$).

Conclusion: This study showed a positive association between resting state EEG slowing and increased cortical excitability in AD, indicating a possible shared mechanistic pathway between these abnormalities.

Perioperative Approaches to Prevent Delayed Neurocognitive Recovery and Postoperative Neurocognitive Disorder in Older Surgical Patients: A Systematic Review and Meta-Analysis

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Background/Objectives: About 10 to 25% of older patients undergoing major non-cardiac surgeries experience delayed neurocognitive recovery (DNR) and postoperative neurocognitive disorder (P-NCD). DNR and P-NCD are associated with worse postoperative outcomes including functional decline, reduced quality of life, and increased mortality. The high prevalence and the risks of worse outcomes make DNR and P-NCD important targets for prevention and intervention. The objective of this systematic review and meta-analysis of randomized controlled trials (RCTs) is to assess the effects of different anesthetic, pharmacological, and non-pharmacological approaches for the prevention of DNR and P-NCD in older patients undergoing non-cardiac surgery.

Methods: An information specialist conducted the literature search for articles from inception to June 2022 using the OVID platform for the following databases: MEDLINE, MEDLINE In-Process/ePubs, Embase Classic + Embase, Cochrane Database of Systematic Reviews, and Cochrane Central Register of Controlled Trials. The search was updated in May 2023. Inclusion criteria were 1) patients 60 years or older; 2) undergoing non-cardiac surgery; 3) receiving intervention for DNR and/or P-NCD; 4) sample size of 100 patients or greater; 5) RCTs with a comparator group; and 6) English language. Qualitative analysis was conducted where detailed descriptions of study characteristics, patient demographics, and postoperative outcomes of DNR and P-NCD were reported. We performed a meta-analysis of interventions to prevent DNR compared to controls. Data were summarized as risk ratios (RR) with 95% confidence intervals (CI). A random effects analysis was chosen over the fixed effects analysis to model the amount of between-study heterogeneity.

Results: Thirty-nine RCTs (9,632 patients) were divided into two categories: 1) anesthetic techniques (25 RCTs, 7,422 patients) and 2) other pharmacological and non-pharmacological approaches (14 RCTs, 2,210 patients). Seventeen trials (5,409 patients) that investigated four interventions for DNR were included in the meta-analysis. The results showed that perioperative dexmedetomidine (RR: 0.59, 95% CI: 0.35, 0.97; P = 0.04) and propofol-based total intravenous anesthesia (TIVA) (RR: 0.81, 95% CI: 0.66, 0.98; P = 0.03) significantly decreased the risk of DNR compared to control. There was no significant decrease in the risk of DNR with regional anesthesia (RA) (RR: 0.89, 95% CI: 0.63, 1.26) or bispectral index (BIS) monitoring (RR: 0.79, 95% CI: 0.60, 1.04) versus the control groups. Evidence regarding the effects of interventions on P-NCD is limited. Although all included trials were at low risk of bias, the quality of the meta-analysis pooled estimates was low.

Conclusion: Our meta-analysis of 17 RCTs shows that dexmedetomidine and TIVA decrease the risk of DNR in older patients undergoing non-cardiac surgery compared to the control group. On the contrary, RA and BIS monitoring did not significantly decrease the risk of DNR. To date, the evidence bases for perioperative approaches to decrease the risk of DNR and P-NCD are limited. Further RCTs with adequate power and sound methodology investigating the effects of interventions on DNR and P-NCD are warranted. Our work summarizes the existing literature and creates an impetus for further research.

Examining Depression in Older Surgical Patients: An Observational Cohort Study of Individuals with and Without Cognitive Impairment

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Background/Objectives: Depression affects individuals across various ages and populations but is of particular significance in the older surgical population due to its adverse impact on cognitive function, surgical recovery, and overall quality of life. This study aimed to (1) determine the prevalence of depression in older surgical patients with and without cognitive impairment (CI) preoperatively, 30-, 90-, and 180 days postoperatively, and (2) compare the preoperative and postoperative trajectory of depression between patients with and without CI at these timepoints.

Methods: Participants aged ≥65 undergoing elective non-cardiac surgery were recruited from preoperative clinics at Toronto Western and Mount Sinai Hospitals in Toronto. Participants were excluded if they had a diagnosed dementia, uncorrected visual and/or hearing impairment, substance misuse, or those undergoing neurosurgery. The Telephone Montreal Cognitive Assessment (T-MoCA) and Modified Telephone Interview for Cognitive Status (TICS-m) were administered over the telephone preoperatively and postoperatively at 30-, 90- and 180-days. Additionally, participants were asked to complete an online survey containing the Ascertain Dementia Eight-item Questionnaire (AD8), Center for Disease Control and Prevention (CDC) single cognitive question, and the 15-item Geriatric Depression Scale (GDS). Preoperative CI was defined as meeting the cut-off for the AD8 (≥2), CDC single question (“Yes”), T-MoCA (£18) or TICS-m (£31). A GDS cut-off of ≥5 was used to define depressive symptoms (mild, moderate, or severe). A linear mixed-effects model was used for data analysis.

Results: Among 307 participants (mean ± SD age: 72.9 ± 5.5; 56.0% female), 38.4% screened positive for CI. The mean GDS score was significantly higher in those with preoperative CI than those without, preoperatively (mean ± SE: 3.69 ± 0.26 vs 1.90 ± 0.21, P<0.0001), at 30- (3.52 ± 0.31 vs 2.66 ± 0.24, P = 0.0192), 90- (3.21 ± 0.36 vs 1.93 ± 0.25, P = 0.0037), and 180-days postoperatively (3.13 ± 0.39 vs 1.53 ± 0.29, P = 0.0022). Mean GDS score decreased over time in both groups (P = 0.0013) with no significant difference in trajectories. Participants with CI had a higher prevalence of depressive symptoms than those without, preoperatively (32.2% vs 11.6%, P<0.0001), at 90- (25.5% vs 10.0%, P = 0.0037) and 180-days postoperatively (25.6% vs 6.5%, P = 0.0067). Preoperatively, of those with depressive symptoms, 73.3%, 16.7% and 10% were mild, moderate, and severe, respectively.

Conclusion: Depressive symptoms are prevalent preoperatively, and postoperatively at 90- and 180-days in older surgical patients with preoperative CI. Those with CI had significantly higher mean GDS scores at all timepoints. One of the six participants with severe depressive symptoms agreed to consult a psychiatric clinic for further evaluation, whereas two refused and three were already on medication for depression. Our novel study findings enable better understanding of the complex interplay that occurs between CI and depression in older surgical adults. These findings have important implications for optimizing perioperative care to improve mental health outcomes in this vulnerable population.

Postoperative Functional Disability in Older Surgical Patients with Cognitive Impairment: An Observational Cohort Study

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Background/Objectives: Approximately half of all surgical procedures are performed in older adults aged ≥65 years, and this number will likely increase with the projected growth of the older population. Older surgical patients with medical comorbidities have an increased likelihood of developing adverse postoperative outcomes. This study aimed to (1) determine the prevalence of preoperative cognitive impairment (CI) in older surgical patients using four remote (virtual/telephone) cognitive screening tools and (2) compare the preoperative and postoperative trajectory of functional disability between patients with and without CI.

Methods: Participants aged ≥65 years scheduled for elective non-cardiac surgery were recruited from Mount Sinai and Toronto Western Hospital, Toronto. Exclusion criteria included diagnosed dementia, clinically evident neurovascular diseases, uncorrected sensory impairment, substance misuse, and neurosurgical procedures. Participants completed an online REDCap survey containing the Ascertain Dementia Eight-item Questionnaire (AD8), CDC single cognitive question, and World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0) preoperatively and postoperatively at 30-, 90-, and 180-day. The Telephone Montreal Cognitive Assessment (T-MoCA) and Modified Telephone Interview for Cognitive Status (TICS-M) were conducted over the telephone. A positive CI screen required meeting the cut-off on ≥1 of the four cognitive screening tools: AD8 (cut-off ≥2), CDC single cognitive question (responded yes), T-MoCA (cut-off ≤18), and TICS-M (cut-off ≤31). A higher WHODAS 2.0 score indicated greater functional disability. Data analysis was performed using a linear mixed effects model with the covariates of time, cognition, and their interaction.

Results: Of 216 participants (mean ± SD age: 72.9 ± 5.7; 58.4% female), 80 (37%) screened positive for preoperative CI on ≥1 of the four screening tools. Twenty-five (31.3%) screened positive on the online survey alone, 41 (51.3%) scored below the cut-off on the telephone assessments alone, and 14 (17.5%) overlapped on both the online survey and the telephone assessments. Those with preoperative CI had a significantly higher WHODAS 2.0 mean score preoperatively (10.4 ± 8.2 vs 6 ± 5.9, P<0.0001) and at 90-day postoperatively (10.5 ± 7.6 vs 5.2 ± 5.5, P=0.0002) than those without CI, indicating greater functional disability. While the WHODAS 2.0 scores decreased for both groups after surgery (P for time<0.0001), the CI group had a higher rate of decline over time from preoperatively to 180-day postoperatively (P for interaction=0.0003), indicating greater improvement in functional disability.

Conclusion: There is a high prevalence of preoperative CI in older surgical patients undergoing non-cardiac surgery. Those with CI had significantly poorer functional disability preoperatively and postoperatively at 90-day. We showed the feasibility of administering remote cognitive assessment tools to screen for CI among older surgical patients and its association with worse preoperative and postoperative functional disability. These findings provide an impetus for early identification of CI and to explore whether management strategies could reduce the risk of CI and postoperative functional disability.

The Effects of Musical Mnemonics on the Behavioural Mechanisms and Related Brain Plasticity of Verbal Learning and Memory in Amnestic Mild Cognitive Impairment

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Background/Objectives: Amnestic Mild Cognitive Impairment (aMCI) is a neurological disease characterized as an early stage of cognitive decline, primarily in memory function. aMCI is considered a salient group to research, due to their substantial vulnerability to progress to dementia. Memory training which induces neuroplasticity in the brain can have potential benefits. Studies investigating the effect of music-assisted learning have consistently shown it to be an effective aid for verbal memory, focusing primarily on dementia, neglecting aMCI. The present study intends to determine whether this influence of musical mnemonics is apparent in the transitional stage between healthy older adults and dementia.

Methods: 30 individuals with aMCI are currently being recruited with The Alzheimer's Society of Toronto and St.

Joseph's Health Centre as active recruitment partners. The study protocol involves three 2-hour sessions over the duration of 4 weeks. Baseline functioning will be measured through a two-pronged standardized assessment of mood and cognition. The study protocol will be reciprocal to that of Thaut et al., 2014, involving the administration of an ordered word-list task while simultaneously undergoing electroencephalography (EEG) recording. This within-subject study paradigm will measure behavioural differences in memory recall of an ordered word list, presented either sung as a musical mnemonic or spoken. The g.Nautilus EEG 32-channel headset by G.tec Neurotechnology will be utilized for noninvasive task-related imaging, with high temporal resolution of the brainwave measures. Analyses will determine the effects of musical mnemonics as an aid in verbal memory, in amalgamation with the associated system-level brain plasticity.

Results: Anticipated results are that musical mnemonics will influence short-term, system-level brain plasticity. Older adults with aMCI will exhibit significantly different learning-related neural synchronization between verbal learning and non-musical memory of an ordered word list with a musical template and without a musical template. Older adults with aMCI will consistently demonstrate improved verbal learning of an ordered word list using musical mnemonics, and improved short-term memory for an ordered word list with a musical template compared to those without a musical template. Older adults with aMCI will be consistent in exhibiting significantly different neural synchronization between verbal learning and non-musical memory of an ordered word list with a musical template or rhythmic structure and spoken without a musical template. Serial order and word chunking will be significantly improved for an ordered word list presented with a musical template or a rhythmic structure, compared to spoken without a musical template.

Conclusion: The need for effective early interventions that address memory loss in aMCI has been heavily stressed in the current literature, making this research of critical importance. A proactive approach to memory interventions for the aMCI population is encouraged to prevent further deterioration in cognition, allowing for individuals to maintain independence and improve their quality of life. My research aims to determine the short-term and long-term effects of music-assisted learning on memory and verbal learning in aMCI. Fewer dementia cases will have a positive domino effect on the public health system, creating more space and availability for resources and for clinicians.

Exploring the Impact of Embedding Community Resources in the Emergency Department

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Background/Objectives: Persons living with dementia (PLWD) visit the emergency department more often, return faster, stay longer and are admitted to hospital at a higher rate than those without dementia. Hospitalization of PLWD is associated with longer stay, poorer outcomes and worsening cognitive status. PLWD are often brought to emergency departments for non-acute reasons due to caregiver burnout and inability to cope with the behavioural and psychological symptoms of dementia. Innovations to avoid non-acute admission to hospital for PLWD are important to be explored to release pressures on the health care system and to improve the quality of life of PLWD.

Methods: A retrospective analysis of hospital admission avoidance among 457 PLWD presenting to the Emergency Department of a hospital within the Brantford Brant Norfolk region from April 2021 to April 2023 was conducted. The study evaluated PLWD who interacted with the Integrated Dementia Resource team. The team, an initiative of the Brantford Brant Norfolk Ontario Health Team, consists of Hospital Navigator, Home and Community Care Coordinator and Community Resource member. Coined the DREAM Team (Dementia Resource Education Advocacy and Mentorship), the team works at the bedside to educate PLWD and their caregivers about available community resources, behavioural management techniques and coping strategies, as well as mentor ED staff. Admission avoidance data was manually collected by the hospital navigator and was counted when all members of the team were present in the emergency department.

Results: An average admission diversion rate of 64.7% was achieved during the time period of the study. Over this time, the team diverted 296 hospital admissions. The team were present in the Emergency Department from 8am to 4pm weekly. Data on dementia visits to the emergency department show no real trend over a three year period, showing diversion data is not skewed by time of day. Visits to the emergency department by PLWD remained consistent prior to and during the early phases of the pandemic and spiked post pandemic. The admission rate for persons with dementia decreased during this period from an average of 45.2% (prior two years) to 40.2%, correlating to the time period the embedded community resource was in place. Of the admissions diverted who received respite, only two returned to the emergency room, both for acute reasons.

Conclusion: It is evident from initial data that a significant hospital admission diversion is occurring through implementation of the integrated team-based model. Value to the healthcare system from hospital diversions amount to over 12.2 million dollars (with 4.0 million in potential Alternate Level of Care prevented) based on average length of stay for PLWD (24 days) and average cost per day. Other benefits of the program include low return visit rate (1.2%), subsequent decreased alternate level of care and reduced caregiver burnout and stress through resiliency education and respite.

Co-Designing a Nature-Based Pilot Research Project with People Living with Dementia and Care Partners: Lessons Learned

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Background/Objectives: This paper presents the process and outcomes of a co-design project with people living with dementia and their care partners. Including the views of people living with dementia in the research process has long been acknowledged as important with many developments in the last decade. The co-design process resulted in the development of a nature-based social health and wellbeing pilot program. This paper aims to contribute to the growing discussions surrounding participatory approaches and co-design in dementia care, while providing valuable insights into this co-design process and lessons learned.

Methods: A participatory approach was employed, involving people living with dementia (n=2), care partners (n=2), and a former care partner (n=1). The co-design process consisted of collaborative sessions aimed at identifying the needs, preferences, and aspirations of the participants. Iterative feedback loops and ongoing dialogue facilitated the development of a pilot project tailored to the requirements and desires of the target group. Practical exercises, such as visiting locations to include in the pilot project demonstrate the importance of abstract and practical engagements in the co-design of research.

Results: Through the co-design process several key priorities emerged, including the importance of connections to nature and the outdoors, social connections, and accessibility. Insights and learnings were gained for future co-design work with people living with dementia, including tools for group priority setting and ways to ensure participation and understanding. The collaborative effort led to the creation of a pilot project that addresses these themes, offering a novel approach to social health and wellbeing for individuals living with dementia and their care partners.

Conclusion: The co-design process underscored the value of involving individuals with lived experience in the development of interventions for dementia care. The insights gained from this process contribute to the growing body of knowledge on inclusive and participatory approaches in dementia care. The findings highlight the significance for people living with dementia and for the research design of incorporating the voices and perspectives of individuals living with dementia and their care partners, promoting person-centered and holistic care practices.

Heterogeneity of Cognitive Function in Older Adults with Mild Cognitive Impairment and Remitted Depression: A Latent Profile Analysis

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Background/Objectives: Remitted major depressive disorder (rMDD) is a known risk factor for developing Alzheimer's dementia (AD). Nearly half of older patients with rMDD have cognitive impairment, and a third meet diagnostic criteria for mild cognitive impairment (MCI), a known prodrome to AD. However, there is a large degree of heterogeneity in the cognitive profiles of older patients with rMDD and rMDD+MCI.

Methods: We analyzed baseline data from the Prevention of Alzheimer's dementia with Cognitive remediation plus transcranial direct current stimulation in Mild cognitive impairment and Depression (PACt-MD) clinical trial. We included participants with rMDD without MCI (rMDD; n=60) or with MCI (rMDD+MCI; n=118) who completed a comprehensive neuropsychological battery assessing verbal memory, visuospatial memory, processing speed, working memory, language, and executive function. We used latent profile analysis to identify data-driven homogeneous cognitive profiles. We also examined differences between the data-driven cognitive groups on demographic, clinical, and regional cortical thickness variables.

Results: We identified three latent profiles: Profile 1 (poor cognition; n=75, 42.1%), Profile 2 (intermediate cognition; n=75, 42.1%), and Profile 3 (normal cognition; n=28, 15.7%). Compared to participants with Profile 3, those with Profile 1 and 2 were older, had lower education, experienced higher burden of medical comorbidities, and were more likely to have MCI. The profiles did not differ on depression scores, age of onset of MDD, number of depressive episodes, current psychotropic medication, cerebrovascular risk, or family history of depression, dementia, or Alzheimer's disease. The profiles differed in cortical thickness of 15 regions, with the largest effects for left precentral ($F(2)=11.2$, $p=6.34E-04$, $\eta 2=0.10$) and pars opercularis ($F(2)=8.6$, $p=3.65E-03$, $\eta 2=0.08$), and right inferior parietal ($F(2)=11.1$, $p=6.34E-04$, $\eta 2=0.12$) and supramarginal ($F(2)=7.8$, $p=4.40E-03$, $\eta 2=0.09$).

Conclusion: Older adults with rMDD or rMDD+MCI can be divided into three clinically relevant subgroups based on their cognitive performance. Future research should validate these subgroups longitudinally to determine their differential risk for developing dementia.

Latent Profiles of Modifiable Dementia Risk Factors in Later Midlife: Associations with 15-Year Risk of Alzheimer's Dementia and Vascular Dementia

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Background/Objectives: In 2020, the Lancet Commission identified 12 modifiable risk factors that may increase dementia risk at the population level. At the individual level, these risk factors may co-occur and may also cluster differently between sexes. Therefore, this study aimed to identify profiles of dementia risk factors in later midlife, to examine differences of profiles between males and females, and to explore associations of these profiles with dementia risk.

Methods: Dementia-free adults aged 60-64 who identified as Caucasian were identified from the UK Biobank. Data for each risk factor (education, hearing loss, traumatic brain injury, hypertension, alcohol consumption, obesity, smoking, depression, social isolation, physical inactivity, air pollution, and diabetes) were collected using a standardized clinical assessment or through linkage of inpatient records. Incident cases of all-cause dementia and dementia due to Alzheimer's disease and vascular impairments were ascertained via hospital admission or death records. A multigroup latent class analysis was performed to identify sex-specific latent profiles of modifiable dementia risk factors. Associations between profiles and risks of all-cause, Alzheimer's, and vascular dementias were explored using the Bolck, Croon, and Hagenaars (BCH) method.

Results: Among n=117,275 participants (males: n=53,426, females: n=63,849), a 4-class solution was identified based on model fit statistics. Invariance testing revealed significantly different class solutions between sexes ($\Delta\chi^2$=11,615,Δdf=52,$p< 0.01$). In general, the following four profiles were identified in males and females: cardiometabolic, psychosocial, substance use, and low risk. Compared to the low risk profile, elevated risks for all-cause dementia were observed in the cardiometabolic (males: OR[95%CI]=2.21[1.98,2.47]; females: OR[95%CI]= 1.39[1.34,1.44]) and psychosocial risk (males: OR[95%CI]=1.40[1.32,1.49]; females: OR[95%CI]=1.52[1.15,2.02]) profiles. The substance use profile demonstrated elevated risks of all-cause dementia in females (OR[95%CI]=1.25[1.24,1.27]) but not males (OR[95%CI]=0.85[0.76,0.95]). When considering Alzheimer's dementia, the psychosocial risk profile demonstrated the highest risk in males (OR[95%CI]=1.13[1.09,1.17]) and the substance use-related risk profile demonstrated the highest risk in females (OR[95%CI]=1.35[1.29,1.41]). The cardiometabolic risk profiles demonstrated the highest risks of vascular dementia in both males (OR[95%CI]=3.93[2.45,6.30]) and females (OR[95%CI]=6.69[2.44,18.39]).

Conclusion: In adults in later midlife, four sex-specific profiles defined by modifiable dementia risk factors were associated with different risks of all-cause dementia, Alzheimer's dementia, and vascular dementia, suggesting potential differences in the effects of profiles on underlying dementia etiology. These findings may help inform targeted strategies for dementia prevention. Studies might further examine the effects of these risk factor profiles on dementia-related pathophysiological changes.

Robustness of Cerebrospinal Fluid (CSF) Amyloid-β 1-42/Amyloid-β 1-40 (Aβ42/Aβ40) and Phosphorylated Tau/Amyloid-β 1-42 (pTau181/Aβ42) Biomarker Ratios in Classification of Amyloid Positron Emission Tomography (PET) Positivity in Routine Clinical Use

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Background/Objectives: Cerebrospinal fluid (CSF) amyloid-β 1-42/amyloid-β 1-40 (Aβ42/Aβ40) and phosphorylated tau (pTau181)/Aβ42 biomarker ratios demonstrated high concordance with amyloid positron emission tomography (PET) in people with cognitive impairment (CI). The robustness of a biomarker assesses how variability, which is expected in routine clinical settings, impacts clinical decision-making. This study aimed to evaluate and compare the robustness of CSF Aβ42/Aβ40 and pTau181/Aβ42 ratios for the diagnosis of Alzheimer's disease in people with mild CI (MCI) or subjective cognitive decline (SCD), with respect to the theoretical bias that may be observed in routine clinical use.

Methods: This retrospective analysis used the β-Amyloid(1-42) CSF and Phospho-Tau(181P) CSF immunoassays (Elecsys®, Roche Diagnostics International Ltd, Rotkreuz, Switzerland) and the research use only β-Amyloid(1-40) CSF immunoassay (Roche Diagnostics International Ltd, Rotkreuz, Switzerland) to measure biomarkers in frozen samples from subjects with MCI/SCD enrolled in the BioFINDER1 cohort, who had a visual amyloid PET result. For each biomarker ratio, biomarker status was compared with amyloid PET status to determine positive and negative percent agreement (PPA and NPA, respectively) for the respective optimal cut-off values (Aβ42/Aβ40: 0.050; pTau181/Aβ42: 0.022). To estimate robustness, reclassification rates and changes in PPA and NPA were calculated with respect to the maximum theoretical bias expected in routine clinical use (±10% bias added to each biomarker).

Results: When comparing the performance of the biomarker ratios with amyloid PET status, for CSF Aβ42/Aβ40 (area under the curve [AUC]: 0.94), the PPA was 0.96 and NPA was 0.88; for pTau181/Aβ42 (AUC: 0.95) the PPA was 0.92

and NPA was 0.89. Following adjustment for theoretical bias, up to 10.5% of people tested with CSF Aβ42 (+10%)/Aβ40 (-10%) would be reclassified (ΔPPA: -20% and ΔNPA: +4.2%) vs. 1.4% tested using pTau181 (-10%)/Aβ42 (+10%; ΔPPA: +3.7% and ΔNPA: -3.6%).

Conclusion: Compared with CSF Aβ42/Aβ40, pTau181/Aβ42 shows greater robustness to bias, and is likely to have greater diagnostic performance and a lower risk of misclassification due to fewer borderline results.

Assessing Knowledge of Alzheimer's Disease at the Workplace: A Comparison Between Employees of a Company in Italy, Portugal, Latin America and Canada

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Background/Objectives: Despite the prevalence of dementia, knowledge of AD is limited, and people often form misconceptions. Knowledge gaps in AD can perpetuate public stigma and act as a barrier for diagnosis as symptoms emerge. Identifying and addressing knowledge gaps in AD may counter misconceptions around the disease and help to facilitate early diagnosis, reduce stigma, lead to improvements in modifiable risk factors of AD and improve QoL for both people living with AD and care partners. The aim of this study is to evaluate current knowledge and awareness of AD in employees of Roche Italy, Portugal, and Latin America and Canada

Methods: A non-interventional, cross-sectional, web-based, multinational study was conducted among employees of Roche Italy, Portugal, Latin America who voluntarily completed the Alzheimer's Disease Knowledge Scale (ADKS) and employees of Roche Canada who completed the Dementia Knowledge Assessment Scale (DKAS).

Results: In total, 907 participants from Italy, Portugal, Latin America responded to the survey. Participants were mostly female (66.7%) and had post-secondary education (94.2%). Overall knowledge about AD was moderate (mean ADKS score (± SD) = 20.9 ± 3.0, overall % total ADKS score = 69.6% ± 9.9). There were statistically significant differences in total ADKS scores between countries (p = 0.000229) but no differences in total ADKS score between sexes (p = 0.086) and differing levels of education (p = 0.073) were observed. The domains with the lowest mean percentage of correct answers were "Risk factors" (54.3%), "Caregiving" (58.6%) and "Diagnosis and assessment" (70.0%). Compared to Canadian participants (n=352), there were not significant differences on the overall knowledge about AD which was also considered moderate (Mean DKAS score (± SD) = 23.06 ± 8.73).

Conclusion: The results revealed ongoing misconceptions in knowledge and understanding of AD in the workplace. There is a need to improve understanding of AD as significant knowledge gaps are present even in a highly educated population working in the pharmaceutical field. Addressing these knowledge gaps could benefit people living with AD and their care partners.

Are We Ready to Use Appropriately Biomarkers to Improve the Management of Patients with AD in Primary Care?

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Background/Objectives: Diagnosis and management of patients with dementia, primarily with Alzheimer's Disease (AD) is rapidly evolving, fuelled by evidence supporting the NIA-AA research framework and clinical staging, and advances in the biological understanding of AD. However, limited information is available about diagnostic and therapeutic decisions in primary care as it pertains to this changing landscape, and any potential barriers or gaps in incorporating biomarkers into clinical practice. The objective of this study was to evaluate factors associated with gaps and risk preferences regarding diagnostic and therapeutic choices in the management of patients with AD by primary care physicians (PCP) across Canada.

Methods: This non-interventional, cross-sectional pilot study assessed PCPs across Canada who evaluate patients with cognitive impairment, referred from the Canadian College of Family Physicians. To assess diagnostic and therapeutic decisions in AD diagnosis and management, ten simulated AD-related case-scenarios commonly encountered in clinical practice were presented. Results were analyzed using descriptive statistics.

Results: A total of 120 PCP completed the study. Regarding diagnostic decisions in Mild Cognitive Impairment vs Early AD diagnosis: - 94.4 % of PCPs decided to request further investigation instead of deferring initial those to the specialist. - Non-specific MRI findings were associated with higher referrals to specialists (58.7% vs 15.3%; p=p <0.0001). Therapeutic decisions: - Overall, only 21.6% of PCP initiated treatment with Acetylcholinesterase inhibitors and Memantine when the diagnosis was confirmed. - As expected, a similar low number of participants (18.4%) requested biomarkers (cerebrospinal fluid studies, PET scans).

Conclusion: The study findings contribute a better understanding of relevant factors associated with diagnostic and therapeutic decisions of PCP in the management of

AD. – Identification of participant’s preferences, the role of behavioral aspects such tolerance to uncertainty, aversion to ambiguity, and therapeutic inertia will help to create and subsequently design an educational intervention.

Variation of Circle of Willis in Posterior Cortical Atrophy

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Background/Objectives: Posterior Cortical Atrophy (PCA) is a rare type of Alzheimer Dementia presenting with early visual dysfunction followed by later cognitive impairment. The condition affects younger persons and may often be mischaracterized. The presence of atrophy in the posterior cerebral cortex noted on imaging can be a sign of the condition. In two cases, the goal was to describe and document the presentations in terms of their clinical, functional, and imaging characteristics together with a description of the Circle of Willis and to establish the feasibility of abnormalities in their presentations of dementia.

Methods: Two cases are presented describing the clinical features, and imaging abnormalities (CT, MRI and SPECT) correlating these with structural variations of the Circle of Willis characterized by Time of Flight MRI. Mathematical modelling of blood flow in the observed variants of the Circle of Willis are presented.

Results: These patients had abnormalities of their Circle of Willis particularly in their communicating arterial systems (anterior and posterior) together with other abnormalities in this structure.

Conclusion: Variations of the Circle of Willis may be important in determining blood flow to key areas of the brain resulting in the phenotype and presentation of Posterior Cortical Atrophy.

Impact of Rural Primary Health Care Memory Clinics: Perceptions of Team Members

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Background/Objectives: Rural persons living with dementia may face low access to specialized services and resources. To address the need for effective care, the Rural Dementia Action Research (RaDAR) Team developed and implemented rural memory clinics in collaboration with primary health care (PHC) teams in Saskatchewan. The aims of this study were to examine patient assessments conducted over a 4-year period in the first three rural memory clinics and to explore team member perceptions of the impact of memory clinics on dementia awareness, assessment and specialist referral, and benefits.

Methods: We completed a secondary analysis of rural memory clinic data and conducted focus groups with memory clinic team members. Patients included in the secondary analysis were assessed in the first three rural memory clinics between 2017 and 2021, guided by an adapted version of the Primary Care Dementia Assessment and Treatment Algorithm (PC-DATATM). Assessment data were entered into a PC-DATATM flowsheet embedded in the Med Access electronic medical record (EMR) system. This information was extracted and transferred to researchers for analysis. Quantitative data were summarized descriptively and thematic analysis undertaken with qualitative data. In January 2022, two focus groups were conducted by telephone with 12 members of three rural memory clinic teams. Focus group questions explored perceptions of dementia care after the implementation of memory clinics, compared to usual care. Audio recordings were transcribed and thematic analysis conducted.

Results: Sixty-two patients were assessed by three rural memory clinic teams over a 4-year period. The low number of patients was partly attributable to reduced clinics and staff shortages during the COVID-19 pandemic. The most common topics included in recommendation letters to patients/families after assessment were follow-up by memory clinic team members, diagnosis, medication, referral to or follow-up by other health professionals, and driving. Compared to usual care, memory clinic team members reported awareness of the memory clinics had resulted in patients/families being more proactive in seeking care. The dementia assessment process in rural memory clinics was described as more comprehensive, coordinated, and collaborative. Perceived benefits included an opportunity to build relationships with patients/families and provide support on the dementia journey, and improved understanding of other health professionals’ knowledge/resources.

Conclusion: Rural memory clinics implemented in collaboration with primary health care teams in Saskatchewan have had a positive impact on dementia awareness and assessment in rural communities. Multiple benefits were reported by memory clinic team members for patients, families, and health professionals. Interprofessional rural memory clinics embedded in primary health care offer coordinated, collaborative, and comprehensive care situated within patients’ local geographic areas, connect patients and families to local supports, and potentially reduce specialist referrals and travel to cities for specialist care.

Online Training and Certification Prior to Using the MoCA Test—Impact on Healthcare Professionals’ Knowledge

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Background/Objectives: The MoCA (Montreal Cognitive Assessment) test is a 10-minute cognitive screening tool developed in 2005 which has high sensitivity (90%) to detect mild cognitive impairment. The paper version is used around the world in over 100 languages. Since September 2020, certification is mandatory to administer the MoCA test. The 60-minute online module comprises a pretest, an interactive module, and a post-test. Certification is obtained once post-test result is at least 70%. This study is the first evaluation of this online training and certification. The main objective is to analyze its impact on the certification rate and on post-test results.

Methods: This study adopted a quasi-experimental one group pretest-post-test design. Participants were screened for eligibility and data from self-reported clinicians was analyzed. Inclusion criteria consisted of (1) being a clinician (i.e., a healthcare professional who self-identified as such), (2) completing the pretest, interactive module, and post-test, and (3) accepting the terms of use consent. They had to answer 20 random questions for the pretest, watch an interactive module, and answer 20 different random questions for the post-test. Data was collected from consecutive database entries between 2020 and 2022. Ethics approval was obtained prior to conducting a retrospective analysis of the database.

Results: A total of 6496 clinicians were included in this study. The mean score for the pretest was less than 70% (M=58.0%, SD=16.5). Participants scored significantly higher on post-test (M=78.8%, SD=14.2). The certification rate was 79.7% for the entire sample. A mixed ANOVA was conducted to compare the means of the three larger groups of participants who use the MoCA on a regular basis: physicians, nurses, and occupational therapists. The ANOVA revealed that each profession obtained a significantly higher score for the post-test. There was significant difference for the within-subjects analysis which accounted for 29.1% of the variance in the data. The effect size was 0.572. The improvement across all three groups was not identical. However, this interaction only accounted for 0.2% of the variance in the data and the effect size was small. The between-subjects effect is significant between groups, and this accounts for 1.6% of the variance.

Conclusion: In this study, we found that participants scored less than the passing grade (70%) at the pretest, and greater than the passing grade at the posttest, representing a statistically significant improvement. Interestingly, physicians who did not self-identify as neurologists, psychiatrists, geriatricians, or family physicians did not have a passing grade on the first post-test attempt. However, this retrospective study has several limitations including classification biases especially regarding medical subspecialties. This suggests a need for online training and certification to ensure the MoCA is scored, administered, and interpreted correctly.

Interprofessional Rural Primary Healthcare Memory Clinics: Patient and Family Experiences

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Background/Objectives: Primary healthcare (PHC) plays a critical role in dementia diagnosis, particularly in settings with few specialists, thus rural-specific models of PHC for dementia are needed. The Rural Dementia Action Research (RaDAR) team has collaborated with PHC teams in rural Saskatchewan to design and implement interprofessional rural memory clinics aimed at increasing access to early diagnosis and post-diagnosic support. Teams include a nurse practitioner or family physician, home care nurse/social worker, occupational and/or physical therapist, and Alzheimer Society First Link Coordinator. The objective of the current study was to explore the assessment and diagnosis experiences of clinic patients and families.

Methods: This analysis focuses on five communities in south-east Saskatchewan (populations 311 to 2,345; mean 2,250). A mixed-method qualitative and quantitative design was used. Semi-structured telephone interviews were conducted after the half-day clinic appointment (n = 8 interviews with 1 spouse, 2 patient and spouse together, 5 adult children). A take-home survey with Likert scale items and open-ended questions was provided at the end of the clinic and returned by mail (n = 25 surveys completed by 3 patients, 12 family/friend, 10 patient and family together). Interviews and open-ended survey questions were analyzed with inductive thematic analysis, and scale items using descriptive statistics. Data collection took place between Nov 2018 and Feb 2023. The number of available participants was affected by the COVID-19 pandemic which led to cancellation of non-acute care clinics in the health region.

Results: Four main themes were identified in the interviews. Local, rural clinics were convenient because travel to urban centres is stressful and tiring, and participants were comfortable with familiar team members. Being heard captures the therapeutic effect of being listened to by supportive, understanding healthcare professionals, and being able to say everything without feeling rushed. Team-based care saved multiple visits and was comprehensive, with more people to help them. Participants felt supported for the future through discussions about expected changes, how to manage them, and knowing help was available. Participants suggested providing more information about the appointment (length, team composition, assessment processes) prompting development of a pre-clinic brochure. Survey responses were also positive, with the majority indicating agree/strongly agree with statements that they felt free to talk about concerns, learned about what to expect and available supports, the team approach was helpful, team members were sensitive, and results thoroughly explained.

Conclusion: Patients and family members reported very positive experiences with the memory clinics. Local, rural-based clinics were important for comfort and convenience. Positive interactions with (and among) team members made families feel supported and heard. They appreciated the combined expertise of team members, which helped to get everyone on the same page. Learning about and being connected to local support services, and knowing they could contact the team if questions arose was reassuring and made them feel hopeful for the future. The benefits reported by patients and families support the expansion of interprofessional primary care based memory clinics in rural communities.

Getting Serious About Serious VR Games for People with Dementia: A Scoping Review of Applications Designed to Date

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Background/Objectives: There is increasing evidence of the effectiveness of game-based dementia treatments, with a growing investment in Virtual Reality (VR). VR-games offer a superior sense of immersion, interactivity, and imagination, providing players with exciting and life-like multisensory experiences. To date, there are no guidelines for their design or use and the number of available apps remains unclear. A systematic environmental scan was conducted to identify and describe currently available VR/AR-games for people with dementia (PwD), their functions and features, and design gaps to consider for increasing the chance of meaningful and long-term use in this unique population.

Methods: Following PRISMA methodology, 255 apps designed to be used in a VR/AR headset by PwD were extracted from popular game-engines (e.g., Oculus, Steam), as well as peer-reviewed and grey literature (e.g., Google, Google Scholar). After removing 42 duplicates, 213 apps were screened by three independent reviewers, resulting in 15 apps included in the analysis stage. Two apps were commercially available to download and as such were tested in a Meta Quest 2 VR headset. A third was available for download but only to tethered systems, like HTC Vive, and was not tested. Four were available for businesses, and eight were only described in the literature. In-depth thematic charting included available information on app purpose, indications for medical use, evidence of therapeutic benefits, user ratings, and design features specific to PwD (e.g., accessibility, safety, user instructions, interaction requirements).

Results: The included apps focused on wellbeing/relaxation/reminiscence (8/15), exercise (3/15), dementia diagnosis/detection (2/15), and cognition (2/15). Most (10/15) described dementia-specific features to support physical/cognitive limitations, social/emotional needs or safety (e.g., intuitive design, multi-modal instructions, familiar environments, remain seated). Three (3/15, for business) featured a “companion” tablet-app for a caregiver to select and monitor content. A minority (2/15) had cooperative capabilities enabling interaction between users in VR None reported compliance with standard accessibility guidelines or medical device certification. Most were in an initial stage of development involving content design and/or end-user engagement (7/15), had undergone early feasibility testing (5/15), or had no apparent validation efforts (1/15). Preliminary efficacy for PwD had been assessed in 2/15: Rendever, showed a positive impact on outcomes related to wellbeing, and Grady’s Game, which did not improve cognition for PwD.

Conclusion: The few VR-apps for PwD are heterogeneous in purpose and yet do not meet their complex needs. Although the majority include dementia-specific features, are theory-based, and have undergone end-user engagement/testing, VR-apps for PwD are in early stages of design/validation, with over half described only in literature. Rigorous studies evaluating efficacy and safety are required before VR-apps can be widely recommended for PwD. Results of this systematic environmental scan include a synthesized set of design considerations to support ongoing efforts to create VR-apps that are engaging and easy-to-use for PwD and serve as the basis for developing formalized guidelines.

Use of Natural Language Processing to Examine Real-World Clinical Practice Patterns in Patients with Dementia and Alzheimer’s Disease in one Primary Care Practice in Ontario, Canada

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Abstract: Primary care physicians (PCPs) play an important role in the early diagnosis of dementia and Alzheimer’s disease (AD) and facilitate access to specialized care and therapies. Diagnostic and screening tools used for AD in primary care are generally not captured in structured real-world data but rather in physician notes. Electronic medical records (EMR) are a rich data source to examine real-world practice patterns in primary care, which can be analyzed using Natural Language Processing (NLP) techniques. Our study objectives were to process EMRs in primary care practice to identify: 1) patients with dementia and AD; 2) diagnostic and screening tools used to assess patients; and 3) disease severity scores for these patients.

Methods: We utilized 10 years of de-identified EMR data from the Queen’s University Family Medicine Restricted Data Environment database from August 1, 2011 to July 31, 2021. The data were obtained from the Queen’s Family Health Team, an academic centre comprising 25 PCPs and 18,000 patients.

NLP was applied on the unstructured chart note data to identify patients with dementia or AD using dementia and AD related keyword search algorithms. Additionally, algorithms were developed to examine diagnostic and screening tools (e.g., Montreal Cognitive Assessment, neuroimaging, etc.) and disease severity scores used by physicians to assess patients' cognitive, behavioural, and functional capabilities. NLP algorithms were developed through multiple phases to extract diagnosis dates, diagnosis codes, and patient demographic information. For disease severity, our algorithm was designed to identify the scale scores and to extract the scores if they were in alignment with the valid scale range for comparison with other published work in the literature. To validate our algorithms, manual chart inspection was performed among a random selection of patient charts to compare and report the performance metrics. The sample size was determined using a calculator based on the following: 50% prevalence with expected sensitivity of 80%, specificity of 80%, with 95% confidence interval, and 10% precision. Quality measures examined included macro-precision, macro-F-score, macro-recall, and accuracy.

Results: There were several challenges with text processing, including contextual information processing, positive or negative sentiment detection, handling noisy or ill-formatted data, removing duplicate notes, recognizing patients and/or family members, identifying diagnostic or screening tools, and referral to other special clinics/services. The manual validation included 125 and 104 patients with dementia and AD, respectively. Our dementia algorithm was able to detect all dementia cases correctly (quality measures all equal to 1), while some false positives were detected by the AD algorithm (quality measures ranged from 0.72-0.89). Diagnostic and screening tools and associated disease severity scores were also identified successfully using NLP.

Conclusion: Using NLP, we were able to detect dementia and AD cases with high precision and accuracy. NLP techniques are a novel methodology that can be leveraged to analyze valuable information in EMR datasets, particularly in the field of dementia. Disclosure: The study was funded by Hoffmann-La Roche.

Workplace Accommodations for People with Early-Stage Dementia: A Survey of Human Resource Professionals in Nova Scotia

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Background/Objectives: People living with early-stage dementia are often capable and desire to continue meaningful work in paid employment. Adjustments to their work situation can make this a more viable option, but these options and are not always readily available. We sought to understand the extent human resource (HR) professionals in Nova Scotia thought their organizations would accommodate individuals with Mild Cognitive Impairment (MCI) or early-stage dementia.

Methods: We conducted an online survey of HR professionals in Nova Scotia. Participants were recruited through social media and convenience sampling. We had 304 respondents with different levels of tenure: 23% had less than 3 years of HR experience, 55% had 3-11 years, and 22% had 12 or more years. Participants were from for profit (54%), not-for-profit (14%), non-profit (8%), and government organizations (23%) of varying sizes: 27% had fewer than 100 employees, 19% had 100-249, 23% had 250 - 499, 12% had 500-999, and 19% had over 1000. We assessed participants' agreement that their organization would make the following accommodations for someone with MCI or early-stage dementia: 1) allocate job duties to another person, 2) transfer the person to a new role to continue meaningful work, 3) change hours, 4) alter the work environment. We used logistic regression to assess the relationship between organizational characteristics and agreement to accommodate.

Results: Compared to HR professions from organizations with fewer than 100 employees, those from organizations with 100-249 employees (OR=3.03, 95%CI=1.34, 7.40), 250-499 employees (3.66, 1.64-8.88), and more than 1000 employees (2.97, 1.31-7.25) had greater odds of agreement with at least one accommodation. HR professionals from organizations with >1000 employees had higher odds of agreeing to allocate duties to another person (2.62, 1.29-5.53), transfer individual (4.48, 2.13-9.87), change hours (2.80, 1.36-5.99), change work environment (2.41, 1.10-5.03) compared to those from small organizations (<100 employees). Compared to HR professionals from for-profit organizations, those from government (3.21, 1.50-7.72), and non-profit organizations (4.84, 1.36-30.92) had higher odds of agreeing with at least one accommodation. Government HR professionals had higher odds of agreeing to allocate duties to another person (3.24 1.72-6.39), transfer individual (2.14, 1.19-3.92), change hours (3.25, 1.75-6.31), change work environment (2.33, 1.29-4.34) compared to those from for-profit organizations.

Conclusion: Larger organizations may be more willing to accommodate people with MCI or early-stage dementia compared to smaller organizations because they may have more resources available. HR professions employed in government may be more sensitive to the importance of accommodation and more familiar with legislation. These results highlight the type of organizations in which people newly diagnosed with MCI or dementia may have difficulty gaining accommodation to help them remain in the workforce. Interventions designed to improve accommodations for people living with dementia may provide more benefit if for-profit and smaller organizations were targeted.

Assessing the Link Between Falls and Neuropsychiatric Symptoms in Patients with Neurodegenerative Disease—Anxiety and Frontotemporal Dementia

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Background/Objectives: Falls are the most common mechanism of injury faced by millions of older adults and those with neurodegenerative diseases (NDs) each year and are often linked to accelerated decrease in quality of life. Those with cognitive impairment, a common symptom of many neurodegenerative diseases, experience a fivefold increased risk of recurrent falls compared to those who are cognitively unimpaired. However, there are large gaps in literature and little research on fall related neuropsychiatric symptoms. We hypothesized that experiencing falls will significantly increase the presence and severity of neuropsychiatric symptoms for those with neurodegenerative diseases.

Methods: We used data from the Ontario Neurodegenerative Disease Research Initiative dataset (ONDRI) on 482 individuals in five ND types. The Neuropsychiatric Inventory (NPI) was used to assess 12 symptoms. We compared frequency of NPI symptoms and NPI severity, respectively, between patients with and without falls in the past 12 months and between different ND types.

Results: For our p-value cut-off of <0.01, comparing those who experienced falls in the last year (n=169; mean-age=68.3±9; 36%Female), to those who had no falls (n=314; mean-age=68.7±7; 32%Female), there was significantly higher total NPI severity (w=22497, p-value = 0.0061), there was significantly higher frequency of anxiety (χ^2(df=1)=13.68; p-value=0.00026); higher anxiety severity (χ^2(df=3)=15.1; p-value=0.002); and higher partner anxiety-related distress (X2(df=3)=19.9; p-value=0.0005). Amongst all those who fell, FTD was the only ND that had significantly (χ^2(df=4)=15.2; p-value 0.004) more patients with anxiety than not. There was no significant (p-value=0.46) sex-based difference between fallers and non-fallers. For a higher p-value cut-off of <0.05, depression (χ^2=5.22(df(1), p-value = 0.02), apathy (χ^2=4.94(df(1), p-value = 0.03), disinhibition (χ^2=5.56(df(1), p-value = 0.02), irregular night time behaviours (χ^2=6.02df(1), p-value = 0.01), and appetite (χ^2=13.3(df(1), p-value = 0.01) were also significantly more frequent in fallers compared to those without falls.

Conclusion: Anxiety frequency, severity and distress were significantly higher in patients with neurodegenerative disease who fell compared to those without falls. Amongst only all those who fell, the FTD group had significantly more patients who had anxiety than not. Neuropsychiatric symptoms, especially anxiety, are frequent and must be assessed in those with previous falls, as they can contribute to worsening conditions, impact baseline treatment for NDs (especially in Frontotemporal dementia), or possibly worsen symptoms from previously undiagnosed neuropsychiatric disorders or post concussion symptoms.

Sleep Disturbances in Older Surgical Patients with and Without Cognitive Impairment: An Observational Cohort Study

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Background/Objectives: Despite the well-established association between cognitive impairment and sleep disturbances in older adults, the relationship between sleep disturbance and cognitive impairment in surgical patients has not been systematically investigated. This study aimed to determine (1) the prevalence and trajectory of sleep disturbances in older surgical participants with and without cognitive impairment at the preoperative assessment and postoperatively; and (2) the risk factors associated with postoperative sleep disturbances. We hypothesize with CI will have a higher prevalence and trajectory of sleep disturbances compared to those without CI at preoperative assessment, 1-3, 30-, 90-, and 180 days postoperatively.

Methods: Participants (≥65 years old) undergoing elective non-cardiac surgery were recruited from pre-operative clinics at Mount Sinai and Toronto Western Hospital in Toronto, Ontario. Preoperative cognitive impairment was defined as hitting the cutoff on any of the four cognitive screening tools: Ascertain Dementia 8 (≥2), Centers for Disease Control and Prevention cognitive question (answered "yes"), Modified Telephone Interview for Cognitive Status (≤31), and Telephone Montreal Cognitive Assessment (≥ 18). At the preoperative assessment, and 30-, 90-, and 180 days postoperatively, participants completed an online survey containing the following assessments: Pittsburgh Sleep Quality Index (PSQI), Visual Analogue Scale Pain, World Health Organization Disability Assessment Schedule 2.0, Independent Activities of Daily Living, FRAIL, EuroQol 5 Dimension, and 15-item Geriatric Depression Scale (GDS). A PSQI cut-off ≥5 was used to define participants having sleep disturbances. A GDS cut-off ≥12 defined participants as having severe depression. Linear mixed effects models with random intercepts were used

Results: Participants (n=129) had a mean age of 72.8 ± 6.2 years with a higher percentage of women (60.6%). Fifty-three participants (41.1%) screened positive for cognitive impairment. In all participants, the mean preoperative

PSQI score was 6.6 ± 3.9 and preoperative GDS score was 6.6 ± 3. Participants with cognitive impairment had a higher prevalence of sleep disturbances than those without, at the preoperative assessment (69.8% vs 44.7%, $P = 0.01$) and 90 days postoperatively (59.4% vs 35.1%, $P = 0.01$). Sleep quality improved in cognitively impaired and non-cognitively impaired groups over time (P for time = 0.4) with no significant differences in trajectories (P for interaction 0.7). A 1 unit increase in preoperative GDS score was significantly associated with a 0.4 unit increase in PSQI score over time postoperatively ($p<0.001$).

Conclusion: Sleep disturbances are highly prevalent at the preoperative assessment (70%) and 90 days (60%) postoperatively in patients who screen positive for cognitive impairment. One risk factor, preoperative depressive symptoms, was associated with poor sleep over time. Limitations of the study include screening for CI instead of diagnosing, and the use of subjective sleep assessment tools instead of objective. Identifying preoperative sleep disturbance and cognitive impairment in surgical cohorts and managing pre-existing sleep disturbance and depression has the potential to optimize surgical outcomes. Our work provides an impetus to further study the impact of sleep disturbances in a surgical setting.

Earlier Dementia Onset in Patients with Neurodevelopmental Psychiatric Copy Number Variants

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Background/Objectives: Advances in genomic sequencing and chromosomal microarray technologies over the past two decades have revealed that a significant proportion of clinical brain disorders are strongly associated with rare genomic variants that have individually large effect sizes and are highly penetrant for human disease. Pathogenic copy number variants (CNVs) involving recurrent chromosomal deletions or duplications are now well-established etiologies of neurodevelopmental psychiatric disorders (NPDs), including autism, intellectual disability, and schizophrenia. Less is known about the relationship between NPD-associated variants and the development of dementia later in life.

Methods: We explored potential associations between CNVs and dementia. We analyzed genomic sequencing results and linked electronic health record (EHR) data for 141,578 adults >35 years participating in Geisinger's MyCode® Community Health Initiative, a biorepository which predominantly includes adults of European ancestry receiving care. DNA sample preparation and exome sequencing were performed in collaboration with Regeneron Genetics Center, with CNV calling based on the Copy number estimation using Lattice-Aligned Mixture ModelS algorithm. From EHR we extracted demographics and International Classification of Diseases codes, including dementia codes. The Charlson Comorbidity Index was used to control for dementia risk factors. Comparisons between CNV status were performed. To assess significance Wilcoxon rank sum test for continuous variables and Chi-Square test for categorical variables were used. Dementia age-of-onset was assessed using a time-to-event analysis accounting for the competing risk of death and covariates determined to be significantly related to CNV status based on bivariate analyses.

Results: Among eligible study participants, 936 (.66%) were identified as having a pathogenic CNV, representing 22 recurrent deletions and duplications. The CNV+ group had significantly higher body mass index (BMI) than controls and higher rates of several chronic medical conditions, including congestive heart disease, diabetes, chronic obstructive pulmonary disease (COPD), and NPD. Although we did not find a difference in overall cumulative incidence of dementia in the CNV+ group (3.74%) compared to CNV- controls (3.88%), a competing risk model revealed a significant shift in the age-of-onset between the two groups. Covariates included sex, race, BMI, COPD, diabetes without complications, NPD, and APOE4 status, and we accounted for time dependence coefficients for sex, BMI and APOE4 status. Patients in the CNV+ group at any time point in the study period were 47% more likely to have onset of dementia than the CNV- group (HR (95% CI): 1.47 (1.04, 2.08), p-value = 0.031).

Conclusion: Our study found that overall cumulative incidence of dementia for CNV+ and CNV- was similar, but there was a significant shift to younger age-of-onset in the CNV+ group. This risk was not accounted for by factors known to be associated with earlier dementia risk (e.g., vascular disease, NPD). Further study is warranted to examine mechanisms by which CNVs may confer risk for earlier onset of dementia.

Strategies to Support the Implementation Of Namaste Care for Persons with Advanced Dementia

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Background/Objectives: Persons living with advanced dementia require frequent opportunities for sensory stimulation and social interaction to maintain their quality of life. Prolonged insufficient stimulation for persons with dementia can lead to apathy, depression, boredom, and isolation. Person-centred programs or interventions such as Namaste Care can support the social inclusion of persons with advanced dementia, often labelled as 'silent residents' in long-term care (LTC). Our objective was to offer strategies to support the implementation of Namaste Care which focuses on psychological, social, and spiritual components to support LTC residents.

Methods: In this qualitative descriptive study, eight focus groups and 22 interviews were conducted with families, volunteers, staff (e.g., nurses, personal support workers, recreation programmers, nutrition managers, and housekeeping staff) and managers at two non-profit LTC homes located in urban areas of Ontario, Canada. We conducted directed content analysis using the Comprehensive Process Model of Engagement as a coding framework.

Results: A total of 68 participants (n=31 from Site 1, n= 37 from Site 2) took part in this study. As a way of engagement, participants shared multiple strategies to support the successful implementation of Namaste Care. Strategies were grouped according to three main categories of the Comprehensive Model of Engagement framework: Environmental, social, and sensory attributes. With regards to environmental considerations, participants emphasized the importance of finding a private and quiet space to hold Namaste Care and using a small group structure to instill feelings of companionship for residents. To support social aspects of the program, participants stressed the need to ensure that staff delivering Namaste Care had individualized knowledge of residents and encouraged collaboration between staff and families to obtain necessary information to tailor activities to residents' needs and abilities. Participants offered approaches to maximize sensory stimulation including the provision of activities that target multiple senses and provide comfort.

Conclusion: Meaningfully engaging persons with dementia is crucial to improving their comfort and quality of life. Findings revealed the need to explore multiple factors that can impact the successful implementation of Namaste Care. Prior to implementing Namaste Care in LTC homes, leaders should take preparatory measures to ensure that staff have the capacity, knowledge, and resources to deliver the program.

Motivation of Older Adults to Participate in a Remotely Delivered Dementia Prevention Study

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Background/Objectives: Research has demonstrated that modifiable risk factors can prevent some types of dementia and that multidomain interventions targeting these risk factors can delay the onset of dementia or slow symptom progression. As research is conducted to evaluate the effectiveness of interventions targeted at prevention, it is important to understand how and why people engage with the research. This study aimed to explore the central research question: What do older adults describe as their motivation for initially enrolling and then continuing to participate in SYNchronizing Exercises and Remedies in GaIt and Cognition (SYNERGIC@Home), a remotely delivered dementia prevention study?

Methods: A qualitative descriptive design was used to explore participants' motivation to initially enroll and then sustain participation in SYNERGIC@Home, a remotely delivered double-blind placebo-controlled dementia prevention trial. Purposeful sampling was employed to recruit participants from the active physical and cognitive intervention arm of the SYNERGIC@Home study that allowed for representation from both biological sexes and both urban and rural dwellers. Individuals in the active physical and cognitive arm participated in aerobic exercises, resistance training, and cognitive training using the NEUROPEAK™ platform. Sessions were held three times weekly for 16 weeks. Semi-structured interviews were conducted with participants after the completion of the intervention to explore the central research question. Thematic analysis was used to identify patterns in the data and develop the themes. Validity strategies of peer debriefing and member checks were employed.

Results: Five participants were interviewed for this study, three female, two males and two living in rural areas. The themes developed from the semi-structured interview data were organized into two sections based on participants' motivation to join SYNERGIC@Home and their motivation for sustained participation in the physical and cognitive interventions. Themes developed under "Motivation to Join" include Fear of Developing Dementia and Making a Difference for Others. Other considerations for joining were noted. Four themes fell under "Motivation to Continue Participating": Rapport with the Research Assistant; Feeling Better; Having Fun, and Barriers and Facilitators to Sustaining Participation. Common recommendations which participants brought forward were also captured. As a behavioural change theory, the Health Belief Model was used with the themes to explore further the participant's motivation to join and stay engaged in SYNERGIC@Home initially.

Conclusion: In recent years, in part due to the global pandemic, dementia prevention research, including interventions, has shifted to being remotely administered. What is unknown in this recent shift is what motivates individuals to engage with interventions conducted remotely in their homes. For SYNERGIC@Home, personal experiences and a desire to make a difference motivated individuals to join, but the human connection, enjoyment and feeling better-kept participants engaged. Future dementia prevention research should emphasize the importance of maintaining human connection even when leveraging technology and designing enjoyable interventions for participants.

The Role of the OT in Adapting Technology Devices and Strategies for Wandering in Elderly Dementia

Galit Liffshiz GLA Rehab.

Background/Objectives: Elderly individuals diagnosed with dementia possess significant behavioural issues, including wandering. This causes life threatening risks to themselves, and distress to their caretakers and loved ones. Wandering can lead to an increased risk of accidents, injuries and disorientation for dementia patients, placing an emotional and financial burden on their caregivers and families. As the world's population ages, the Occupational Therapists (OTs) that are treating and servicing this population, have been finding effective and proactive strategies to address wandering behaviour.

Methods: This presentation will inform the audience how OTs are developing knowledge on various technological interventions and adaptation, which have shown promising results related to improve safety, reduce caregiver burnouts and reduce financial challenges of elder care. The OT role is finding the best technology for the dementia patient's support system. This can be from using a smart watch with a GPS, to setting up a smart home system with monitors and alerts, directly to the caregiver's phone. The integration of artificial intelligence holds hope for early identification of wandering patterns, by analyzing data and drawing conclusions.

Results: OTs are familiar with these technologies and are helping caregivers to assemble preventative measures when wandering might occur.

Conclusion: As technology advances, there is a continuous interest in exploring how technological solutions can assist this vulnerable population.

What are the Dementia Care Learning Needs of Healthcare Providers in Primary Care?

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Background/Objectives: The provision of quality dementia care is predicated on having a healthcare work force that has the knowledge and skills needed to manage the complex needs of people living with dementia. However, it is well documented that dementia often goes undiagnosed and untreated, suggesting that there is a need for capacity building in dementia care. The purpose of this study was to assess the current dementia practice and learning needs of primary care providers prior to attending the Multispecialty Interprofessional Team (MINT) Memory Clinic training program, which trains healthcare providers to establish primary care-based Memory Clinics.

Methods: Using a survey methodology, 217 multidisciplinary healthcare providers from 15 primary care settings establishing a memory clinic across four provinces (Alberta, British Columbia, New Brunswick, Saskatchewan) were invited to complete a survey prior to the training program between February 2021 and June 2023. Respondents rated the extent to which their academic education prepared them to manage dementia; their knowledge, skills, and confidence related to the assessment and management of dementia and frailty (5-point scales: 1=Not at all; 5=Extremely) and identified whether they had engaged in various dementia-related practice activities (assessment of caregiver burden and driving capacity, reporting of driving concerns, frailty screening) in most cases for persons with memory complaints in the previous six months (yes, no, not sure). Respondents were asked to identify their discipline and years in clinical practice.

Results: 57 surveys were completed (72% response rate). Respondents included physicians (24%), nurses (27%), social workers (16%), community service providers (16%) and other health professionals (17%); mean time in practice was 15 years (SD=14.3). Mean ratings reflected that respondents felt they were 'somewhat' prepared to provide dementia care (3.0; SD=1.0), 'somewhat' knowledgeable about the assessment (3.3; SD=1.0) and management (3.2; SD=0.93) of dementia, 'somewhat' able to assess frailty (3.2; SD=1.0), and 'moderately' able to assess (3.5; SD=1.0) and manage (3.5; SD=0.88) cognitive impairment. Mean ratings reflected that while they were 'moderately' confident in their ability to assess memory concerns (3.5; SD=1.0), they were 'somewhat' confident in their ability to screen for frailty (3.1; SD=0.99) and manage dementia (3.3; SD=0.93). Less than half of the respondents reported that they had assessed caregiver burden (37%) or driving capacity (40%), reported driving concerns (37%), or assessed for frailty (24%) in patients with memory concerns.

Conclusion: Practicing healthcare providers from across Canada found themselves inadequately-prepared for dementia care. Limited self-reported knowledge, skills, and confidence related to dementia care and frailty, and infrequent engagement in specific dementia-related practice activities suggests a significant need for training in many areas of dementia care. As the severe shortage of specialists means that more dementia care will need to be delivered in primary care, models of dementia care that include comprehensive training, such as the standardized accredited training and mentorship offered in the MINT Memory Clinic care model, are needed to build capacity to meet the needs of an aging population.

Dementia Dastan: Exploring the Experiences of South Asian Canadians Living with Dementia and Their Care Partners

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Background/Objectives: Dementia affects millions worldwide, with projections indicating that it will become one of the leading global causes of death by 2040. People living with dementia and their care partners from culturally and linguistically diverse communities face unique challenges in managing their health conditions and accessing healthcare services. South Asian communities in Canada, one of the fastest-growing ethnic groups, encounter distinctive cultural beliefs and practices that influence their experiences with dementia. This research project aims to explore the experiences of South Asian Canadians living with dementia, their care partners, and the perspectives of physicians and Alzheimer's societies in dementia care journey.

Methods: This qualitative research project adopts an interpretive phenomenological approach to explore participants' subjective experiences in dementia care within South Asian communities. Three distinct studies will be conducted. Study 1 involves in-depth interviews with 5-7 South Asian Canadians living with dementia and their care partners to explore their experiences in recognizing symptoms, diagnosis, and accessing services. Interviews will be conducted virtually in Hindi, Punjabi, and English to ensure inclusivity. Study 2 will conduct in-depth interviews with 5-7 physicians experienced in diagnosing dementia in South Asian patients, shedding light on challenges and perceptions of cultural differences and language barriers. Study 3 will explore service delivery experiences of Alzheimer's societies with South Asian communities through interviews with 5-7 employees. Thematic analysis using NVivo 12 will systematically identify the data's patterns, themes, and meanings.

Results: The research findings are expected to contribute valuable insights into the experiences and perspectives of South Asian Canadians living with dementia and their care partners. By understanding the cultural nuances that influence dementia care, this research aims to promote culturally sensitive approaches that enhance support and reduce stigma. Moreover, exploring physicians' experiences and Alzheimer's society perspectives will inform the development of tailored interventions to improve diagnosis and service delivery within South Asian communities.

Conclusion: This research contributes to the growing body of knowledge on dementia care from diverse cultural perspectives. It underscores the importance of incorporating cultural beliefs and practices into person-centred care models. Ultimately, the findings aim to improve dementia care outcomes and ensure equitable access to services for South Asian Canadians living with dementia and their families.

The Comprehensive Approach to Dementia Data Monitoring in Canada (CADDM) Project: Realist Review-Risk Factors

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Background/Objectives: Dementia is a significant public health concern requiring an enhanced surveillance system to understand its impact on individuals and society better. The Comprehensive Approach to Dementia Data Monitoring in Canada (CADDM) project aims to enhance dementia data collection and monitoring in the country. One of the project's objectives is to conduct a realist review that identifies risk factors for dementia and develop a holistic model categorizing these factors across the life course and multiple domains, from individual to environmental influences.

Methods: The realist review in the CADDM project systematically identified factors influencing dementia risk. It utilized a comprehensive approach, including an extensive literature search with strict inclusion criteria. Data from selected studies were rigorously assessed, and the research team systematically organized the identified factors based on their evidence level, i.e., established (high level of evidence and an overall agreement of the results, e.g., systematic reviews, meta-analyses, randomized controlled trials), potential (evidence comes from individual observational studies, e.g., cross-sectional studies, case-control studies, quasi-experimental studies) and theoretical (evidence that is rooted within a hypothesis, theory, or idea, e.g., hypothesis or theory-based research). The resulting factors were organized into a holistic model that offers a more comprehensive understanding of dementia risk.

Results: The realist review yielded many factors contributing to the risk of developing dementia. These factors varied from established factors, such as physical health, to potential factors, such as social support, and theoretical factors, such as the microbiome, requiring further investigation. These factors were organized into a holistic model that also considered factors across the life course, from early life influences to those occurring later in life. This approach allowed for a deeper understanding of the complexities and interactions between various factors that contribute to the development of dementia. The findings of this review will inform the development of a more person-centred framework for dementia data monitoring that incorporates the identified risk factors and considers the heterogeneity of dementia.

Conclusion: The CADDM project's realist review identified and categorized various risk factors for dementia. The project's findings highlight the importance of person-centred care and have broader implications for public health and policy initiatives. In conclusion, the CADDM project's realist review supports dementia care and prevention in Canada, offering a pathway towards improved quality of life for individuals living with dementia and care partners.

Improving Communication of Inpatient Comprehensive Geriatric Assessments to Family Physicians for Frail Older Adults: A Mixed Method Study

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Background/Objectives: In Canada, around 60% of Major Neurocognitive Disorders (MNCD) are not diagnosed. Many are diagnosed during an acute illness, in hospital by geriatricians. However, many Canadian provinces lack a systematic process for communicating geriatricians' impressions and plans to family physicians, leading to a loss of valuable information and recommendations. The objectives of this ongoing study are to describe the transmission of geriatricians' impressions and plans to outpatient providers, identify barriers and facilitators to implementing best practices, and generate evidence-based recommendations to improve this transmission across Quebec.

Methods: We are conducting a sequential explanatory mixed-method study. First, an electronic survey was developed to collect the knowledge, attitudes, and practices of geriatric fellows and geriatricians regarding the transmission of their notes/discharge summaries to the patient's primary care providers. A descriptive analysis was performed. Second, we will conduct 20-minute semi-structured interviews, with interested survey respondents. Participants will be asked to elaborate on their practices, the barriers and facilitators they identify, and the recommendations they suggest on the transmission of information to primary care professionals. Thematic content analysis will be used to analyze the contents of the interviews.

Results: Some of our key survey results indicated that 67% of geriatricians believe that discharge summaries should be sent to the primary care team, and 48% believe that lacking a systematic procedure to do so negatively impacts the quality of care. Only 2% say that such a procedure currently exists. We are currently still in the process of conducting the interview but will have preliminary results ready in time for the conference.

Conclusion: The lack of a systematic process for information transmission to the primary care team is a challenge to providing safe and high-quality healthcare to frail older adults. Persons with dementia may be disproportionately impacted by this lack of information continuity, potentially leading to grave consequences for the patients as well as the healthcare system. Through this study, we hope to generate and disseminate actionable recommendations on effective strategies to improve the transmission of geriatricians' insights to family physicians in the community.

The Hierarchic Dementia Scale as a Tool to Track Changes in Cognitive Status in the Long-Term Care Setting

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Background/Objectives: The Hierarchic Dementia Scale (HDS) is a severity scale that is free from floor effects in persons with severe dementia and that provides individualized information about a variety of cognitive domains that can be used to tailor person-centered interventions. Despite the advantages of this rating scale, it has not been widely used in clinical practice nor in dementia research. The purpose of this study was to assess the feasibility of HDS use in this population, to describe changes in the score over time, and to determine the correlation of each subscale with the HDS total score.

Methods: This study took advantage of data collected to date from the PREvention Program for Alzheimer's RElated Delirium (PREPARED) Trial, a cluster randomized control trial assessing the efficacy of a multicomponent intervention in reducing delirium incidence and severity in long-term care (LTC) residents with dementia. Participants from 14 LTC facilities who were at high-risk for delirium and delirium free at baseline were enrolled. The HDS was administered at baseline and at end of follow-up (week 18). Written comments by subscale were provided at the time of administration when challenges arose. The HDS subscales were categorized by cognitive domain. T-tests were conducted to assess the mean differences in total HDS score, score by subscale, and score by cognitive domain between weeks 1 and 18. Pearson correlation coefficients were calculated to determine the correlation of each subscale with the HDS total score.

Results: In total, baseline and follow-up HDS evaluations were completed for 125 and 85 participants, respectively. The mean total HDS score at baseline for all participants was 122.64, for the control group was 127.22, and for the intervention group was 104.77. The most frequent reason for lack of a follow up assessment was COVID infection (73%). Subscales with missing values were most commonly attributed to visual impairment. Among the 85 participants who underwent both evaluations, mean differences in HDS total score (week 1 vs. 18) comparing intervention and control arm participants were -12.41 and -4.92 respectively, but this difference was not statistically significant (t=-0.99; p=0.8378). The motor and prefrontal subscales correlated the least to total score at weeks 1 (r=0.21 and r=0.22, respectively) and 18 (r=0.28 and r=0.39, respectively).

Conclusion: The HDS is useful for tracking changes in dementia severity over time. Its use, however, may be limited in persons with visual impairment. Future research should investigate whether the prefrontal and motor subscales should be removed for ease of administration.

Preliminary Results of a Trial of Remotely-Delivered Interpersonal Psychotherapy for Care Partners

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Background/Objectives: Informal care partners of persons with dementia are an essential pillar of care. While the caregiving relationship has been shown to provide many benefits, feelings of psychological distress (e.g., depression, anxiety) are common and can lead to increasing feelings of burden. Research based on various theories suggests that informal social support is a protective resource for care partners because it keeps such feelings at bay. Unfortunately, care partners tend to experience problems in their social support network (e.g., isolation, miscommunication, unidentified or underutilized resources) and social support interventions are scarce, particularly for rural caregivers.

Methods: Interpersonal psychotherapy (IPT) is an evidence-based psychological intervention shown to decrease feelings of depression and anxiety in multiple populations, but it has never been studied with care partners. The approach focuses on improving interpersonal functioning through strategies such as identifying support resources, matching support types, assertiveness skill building, and increasing effectiveness of interpersonal communication. This n-of-1 (case study series) feasibility study is currently trialing remotely delivered IPT within a small sample of care partners (n=3). The Hospital Anxiety and Depression Scale is completed pre- and post-intervention, as is the 12-item Zarit Burden Interview. The Medical Outcomes Study - Social Support and UCLA Loneliness Scales capture dimensions of social support and loneliness, respectively, across sessions. Post-intervention subjective interviews are completed based on Bowen and colleagues' (2009) feasibility framework (e.g., satisfaction, practicality, appropriateness, effectiveness, continued use).

Results: All participants are married female children of care recipients (aged 50 to 63 years). Two participants have completed the intervention. Preliminary data suggests some improvement in depressive symptomatology, reduction or maintenance of level of subjective burden, and increased subjective confidence in/satisfaction with ability to communicate support needs to others. An increase in level of emotional support was observed in one participant; maintenance of the same and a reduction in level of loneliness was observed in the other. Qualitative post-intervention interviews suggest that an IPT approach is appropriate for care partners. Interpersonal skill acquisition was described as a key benefit. Overall, both care partners expressed satisfaction with the intervention and stated that they will continue to employ learned skills. Limitations to this feasibility study include small sample size with limits to generalizability. In addition, all participants are care partners caring for parents, which may also limit generalizability to other caregiving subpopulations.

Conclusion: These findings provide emergent evidence for the feasibility of utilizing IPT with care partners. There are preliminary findings of maintenance or improvements to levels of depression, loneliness, and subjective burden as well as improvements in interpersonal functioning (e.g., communication of support needs, identification of resources). Future directions may include trialing with a larger sample size as well as evaluating the feasibility of integrating IPT components into existing support protocols (e.g., care partner support groups).

Understanding the Hazard Posed by Cardiovascular Risk Factors in Increasing Dementia Risk for Individuals with Bipolar Disorder

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Background/Objectives: Bipolar disorder (BD) affects up to 2% of Canadians and has been shown to more than double the risk of dementia. In addition to this, individuals with BD who go on to develop dementia show cognitive decline earlier - by an average of 5 years - than their non-BD counterparts. The risks driving cognitive decline have been well-studied in the non-BD population; however, this remains to be explored fully among the BD population. One such factor is cardiovascular risk factors (CVRFs). As such, this study seeks to compare risk for incident dementia among individuals with and without incident dementia.

Methods: Participants in the study were adults 50 years old and older from the National Alzheimer's Coordinating Centre (NACC) data repository. Individuals were first divided into two groups, those with clinician or self-diagnosed BD and those with no reports of BD. Inverse propensity treatment weights (IPTWs) were generated using age, sex, years of education, depression severity (as measured by the Geriatric Depression Scale), and the number of apolipoprotein-E4 (ApoE4) alleles. The inclusion of IPTWs in regression analyses aids in accounting for the fact that randomization is not possible in this sample (i.e., to BD or non-BD groups) and maximizes the sample size for analyses. Analyses, consisting of Cox regression, are underway to assess hazard for BD diagnosis and CVRFs (smoking status, hypertension, obesity, diabetes, and hypercholesterolemia) for incident dementia (no incident dementia labeled as censored). BD by CVRF interaction terms will be included.

Results: There are substantially more individuals without BD (n = 28,061) than with BD (n = 242) in NACC. Individuals with BD have a greater percentage of progression to dementia (18.6%) than non-BD participants (14.6%), as well as percentage of smokers (11.2% vs 4.4%) and individuals with diabetes (18.6% vs. 13.9%). As such, it is predicted that these factors will be significant in increasing hazard of incident dementia in the context of BD, presuming that these factors could be driving the increased risk of incident dementia reported in other studies. It is further predicted that BD status will show increased hazard of incident dementia compared to non-BD, as with presence of a CVRF compared to no CVRF. Note that no predictions are made for covariates as IPTWs will balance the effect of these variables between groups. Detailed results will be presented at the conference and implications will be discussed.

Conclusion: Broadly, this study will increase understanding of the role of CVRFs in BD among the aging population. The results of the study stand to support current research that shows that individuals with BD are at greater risk of incident dementia and furthers this current understanding by exploring the role of CVRFs in the context of this psychiatric diagnosis. There will, however, be further studies needed to understand this risk in this underserved and under-researched population, considering that the NACC data repository has limited generalizability.

Predicting Functional Decline in the Aging and Alzheimer’s Disease Continuum with PET-Based Braak Staging

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Background/Objectives: The progression of PET-based Braak stages correlates with cognitive deterioration in aging and Alzheimer’s disease (AD). Here, we investigate the association between PET-based Braak stages and functional impairment and assess whether PET-based Braak staging predicts a longitudinal decline in the performance of activities of daily living.

Methods: In this cohort study, we evaluated cognitively unimpaired (CU) individuals and individuals with mild cognitive impairment (MCI) or AD dementia. Participants underwent [18F]MK6240 tau-PET, were assigned a PET-based Braak stage at baseline and were followed for a mean (s.d.) of 1.97 (0.66) years. Functional performance was evaluated with the Functional Activities Questionnaire (FAQ), Everyday Cognition (ECog) and functional Clinical Dementia Rating sum of boxes (CDR-SB). Multiple linear regressions assessed the association of PET-based Braak stages with baseline functionality and with the longitudinal rate of change in functional scores, adjusting for age, sex, and amyloid-β (Aβ) load. We employed voxel-based regression models to investigate the association between functionality and tau-PET signal and assessed the voxel overlap with Braak regions of interest (ROIs).

Results: We included 291 individuals (181 CU, 56 Aβ+ MCI, and Aβ+ 54 AD) aged 70.60 (7.48) years. At baseline, PET-based Braak stages III-IV (β=0.43, p=0.03) and V-VI (β=1.20, p<0.0001) showed associations with poorer FAQ scores. Similarly, stages III-IV (β=0.43, p=0.02) and V-VI (β=1.15, p<0.0001) were associated with worse ECog scores. Only stages V-VI were associated with higher functional CDR-SB (β=1.17, p<0.0001) scores. Increased tau-PET signal in all Braak ROIs were linked to worse performance in all tools. The voxelwise analysis showed widespread cortical associations between functional impairment and tau-PET and high voxel overlap with Braak ROIs. Baseline PET-based Braak stages V-VI predicted significant longitudinal functional decline as assessed by the FAQ (β=1.23, p=0.003), the ECog (β=1.06, p=0.001), and the functional CDR-SB (β=1.29, p<0.0001).

Conclusion: Our results suggest that functional impairment increases with the severity of tau accumulation and is a late event in AD pathophysiology. These findings also indicate that PET-based Braak staging is a good predictor of functional impairment in the AD continuum. Finally, our study provides evidence for the clinical significance of the PET-based Braak staging framework.

Sleep Microstructure and Cognition in Obstructive Sleep Apnea

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Background/Objectives: The increased risk of cognitive impairment and dementia with obstructive sleep apnea (OSA) is primarily attributed to nocturnal hypoxemia and sleep fragmentation. However, relationships between conventional metrics of OSA severity (apnea-hypopnea index; AHI), hypoxemia, and arousals from sleep and cognitive function are modest at best. Measures of sleep microstructure including spindle characteristics and the odds-ratio product (ORP; a novel continuous measure of sleep depth) may provide additional biomarkers to characterize OSA patients at risk of cognitive impairment.

Methods: Adults from the Canadian Sleep and Circadian Network’s OSA observational cohort who underwent full-night in-laboratory polysomnography and completed cognitive testing consisting of the Montreal Cognitive Assessment (MoCA; global cognition), Rey Auditory Verbal Learning Test (RAVLT; memory) and WAIS-IV Digit-Symbol Coding (DSC) subtest (information processing speed), and sleep and medical history questionnaires were included in this study. Associations between cognitive scores and stage 2 NREM sleep spindle density, power, frequency and %-fast (12-16Hz) and ORP were assessed using multivariable linear regression adjusted for age, sex, education, and total sleep time; results are reported as standardized parameter estimates (β) and 95% CI. Multiple mediation analyses were performed to identify mediators of the detrimental effect of moderate-severe OSA on cognitive performance. Mediation effects and 95% confidence intervals (percentile method) were estimated using 10,000 nonparametric bootstrapping iterations.

Results: Participants included 400 individuals with no/mild OSA (49±14 y (mean ± SD); 52.1% female; AHI (median [IQR]): 10.8 [5.8-21.0]), 145 with moderate OSA (55±13 y; 43.4% female; AHI: 20.9 [17.8-24.3]), and 88 with severe OSA (56±13y; 42% female; AHI: 48.0 [36.0-63.9]). Compared to the no/mild group, participants with severe OSA had a lower MoCA total score (23.8±4.0 versus 26.2±2.9, $p<0.001$) and, when expressed as z-scores relative to age-matched norms, worse delayed recall (-0.7±1.3 versus -0.2±1.1, $p=0.002$) and processing speed (-0.7±1.1 versus -0.4±1.0, $p=0.056$). Spindle density, power, frequency and %-fast were all lower in participants with moderate and severe OSA compared to no/mild OSA ($p\leq0.001$). Spindle density was positively associated with MoCA total (0.08 [0.00-0.16]) and DSC scores (0.10 [0.01-0.18]) while spindle frequency and %-fast spindles were associated with the MoCA total (0.10 [0.02-0.19]; 0.12 [0.03-0.20], respectively), RAVLT delayed recall (0.14 [0.05-0.22]; 0.12 [0.04-0.21]) and DSC (0.09, [0.00-0.18]; 0.12 [0.03-0.21]) scores. ORP averaged across total recording time and NREM sleep (ORPNREM) were highest in patients with severe OSA ($p\leq0.001$ versus no/mild and moderate OSA) but were not associated with cognitive performance in multivariable linear regression ($p\geq0.102$). In independent mediation models, spindle frequency (-0.06 [-0.18-0.00]) and %-fast spindles (-0.07 [-0.20-0.00]) mediated the negative effect of moderate-severe OSA on MoCA total score, along with the arousal-awakening index (-0.26 [-0.48 to -0.05]) while ORPNREM (-0.02 [-0.06 to 0.00]), spindle power (-0.03 [-0.09 to 0.00]) and %-fast spindles (-0.03 [-0.08 - 0.00]) mediated the negative effect of moderate-severe OSA on DSC scores.

Conclusion: Assessment of spindle activity and ORP during NREM sleep may offer additional biomarkers to help identify individuals with OSA at risk of cognitive impairment.

Stakeholder Engagement to Inform a Program of Applied Nutrition and Dietetics Research in Dementia

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Background/Objectives: Nutrition is an integral factor in all stages of dementia, spanning prevention to end-of-life. Personal and cultural aspects of eating and drinking are essential elements that must be factored in when determining safe and appropriate food choices that fulfill nutritional requirements to support persons with dementia to live well. It is critical that the perspectives of people with personal and professional experience contribute to evidence-informed solutions and decision-making to enhance nutritional well-being. Objective: Participants will be able to identify priorities for applied research on nutrition and dementia as outlined by a group of stakeholder participants.

Methods: Stakeholders attending the Rural Dementia Action Research (RaDAR) annual Dementia Summit were invited to participate in virtual focus group discussions and contribute ideas to shape a meaningful program of nutrition research. Stakeholders included people living with dementia, care partners, clinicians, healthcare providers, researchers, and decision-makers. Following a presentation outlining how nutrition and dementia is conceptualized (person-centred; evidence-based; eating as physiological and psychosocial activity of daily living), stakeholders self-selected into one of three groups: Prevent dementia; Advance therapies and find a cure; Improve the quality of life of persons living with dementia and their caregivers. Each group was moderated by a trained Research Assistant, using a set of questions and prompts to stimulate discussion about nutrition and dementia research. Virtual Zoom discussions were recorded and auto-transcribed and the Zoom chat was captured. These were analyzed thematically.

Results: Each group had good representation from different stakeholder group designations. There were 19 participants in the ‘Prevent’ group, 11 in ‘Therapies’, and 18 in ‘Quality of life’. Analysis yielded three themes: ‘Combatting Myths’, ‘Realistic Considerations’, and ‘Emphasizing Positives’. Overall, the need for effective applied nutrition strategies to prevent, treat, and support living well with dementia was highlighted. Under ‘Combatting Myths’, participants described challenges in navigating misinformation, ‘fads’, and understanding how evidence can be applied. Within ‘Realistic Considerations’, participants emphasized the need to consider contextual factors such as access and affordability of food, abilities of care partners and healthcare providers, personal or cultural preferences, and right to choose. Under ‘Emphasizing Positives’, participants described the need for nutrition interventions to embrace the positive aspects of eating and drinking at all stages of a person’s dementia journey, and to use nutrition for enjoyment and pleasure as well meeting physical needs.

Conclusion: Stakeholder engagement yielded valuable recommendations to inform a program of nutrition and dementia research. The format enabled engagement in an efficient manner, and themes resonated across the three discussion groups. In order to develop effective applied research interventions, experts with lived experience must be engaged at the beginning of the research process. Insights from these focus groups will be used to develop applied nutrition interventions to prevent, treat, and support living well with dementia. Further stakeholder engagement at each stage of the research process is essential for effective and impactful research outcomes to support nutritional wellbeing of people with dementia.

Innovative Technologies and Therapeutic Interventions: Reducing Responsive Behaviours in a Geriatric Dementia Unit

Julie Earle[1], Bonnie Jean-Baptiste[1], Angie Miller[1].
[1]*Ontario Shores.*

Background/Objectives: Ontario Shores Centre for Mental Health Sciences (Ontario Shores) is a 346-bed public teaching hospital in Whitby, Ontario that provides a range of specialized assessment and treatment services for people living with complex and serious mental illnesses. Within the Geriatric Program, the Geriatric Dementia Unit (GDU) provides comprehensive inpatient care integrating novel and innovative technologies to provide support to those patients with behavioural and psychological symptoms of dementia (BPSD). GDU is a 23-bed unit with a 59-day length of stay (LOS) providing services to patients in the CELHIN as well as other remote, underserved areas of the province.

Methods: On the GDU, we implemented innovative and novel technologies to create a therapeutic environment, with the intention of reducing responsive behaviours, PRN medication use and improving patient outcomes. Three interventions were introduced: Environmental Optimization: Focus groups and literature review determined the therapeutic value of colour from the perception of the aging eye to create a space that supports patients with dementia, creating an interactive environment through the use of colour and murals. Immersive Projector The 360-degree immersive projector creates an environment that is engaging and interactive to suit individual needs, support cognitive stimulation, redirection, further reducing responsive behaviours. Montessori Room: The Montessori Room creates a room with interactive activities to promote joy and purpose in the lives of the inpatients on the unit through doll therapy and multiple work stations including a workshop, office, kitchen and an area for the creation of art.

Results: Over the course of three years (2020 to 2023), these specific interventions were incorporated into the GDU to give meaningful engagement and create sense of value and worth to support recovery and reduce pharmacological interventions. Aligning with the implementation of the environmental optimization, immersive projector and Montessori Room, we have demonstrated a significant decrease in aggressive incidents, from 229 in 2019/20 to 94 incidents in 2022/23, a 58% decrease. We have also demonstrated a significant increase in the utilization of nonpharmacological strategies in the nursing approach to patient care, while reducing the PRN medication orders by 18%. Patient outcomes have improved, patient engagement surveys demonstrate overall satisfaction with the inpatient stay. Families and supports have provided meaningful feedback on the use of these nonpharmacological interventions, valuing the humanistic and holistic approach. Lastly, LOS has continued to be maintained with over 90% of patients being discharged within the 59-day LOS pathway.

Conclusion: Through the implementation of three separate strategies; environmental optimization, an immersive projector and the Montessori Room, we have created a dementia friendly environment using both simple and novel technologies to reduce BPSD. We have successfully correlated the implementation to a reduction in aggressive incidents and pharmacological interventions, as well as an increase in nonpharmacological strategies to reduce responsive behaviours. Additionally, provided a dementia centred environment has improved patient and caregiver/support satisfaction, while maintaining the 59-day LOS pathway.

Reducing Restraint and Enhancing Safety: A Geriatric Dementia Unit Approach

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[1]*Ontario Shores.*

Background/Objectives: Ontario Shores Centre for Mental Health Sciences (Ontario Shores) is a 346-bed public teaching hospital in Whitby, Ontario that provides a range of specialized assessment and treatment services for people living with complex and serious mental illnesses. Within the Geriatric Program, the Geriatric Dementia Unit (GDU) is a 23-bed unit with a 59-day length of stay (LOS) providing services to patients in the CELHIN as well as other remote, underserved areas of the province. The goal was to move to a least restraint philosophy supporting senior friendly care by the reduction of safety devices/restraints in a geriatric setting.

Methods: In daily safety huddles unit acuity, patient incidents, and team concerns were reviewed. In addition, during these meetings, the team reviewed the safety devices and restraints in use, assessing their necessity, and collaboratively set patient-specific goals to minimize their use. To ensure accurate data collection, the team documented usage of these devices in the patient's medical record. Specific safety devices such as pelvic restraints, lap belts on wheelchairs, table tops, Huntington's chairs were identified for evaluation. There was an emphasis on educating all team members on the potential risks associated with physical restraint. Additionally, the team implemented a holistic approach aligning with the PIECES Framework to reduce falls and restlessness, specifically considering unmet patient needs, prompted voiding and non-pharmacological interventions. The involvement of family and caregivers in developing patient-specific goals further fostered a least restraint model of care, promoting a patient-centered approach to safety and well-being.

Results: The implementation of universal falls precautions, including bed and chair alarms, alongside high/low beds, facilitated the adoption of a least restraint model. Concurrently, mobilization schedules were applied to maintain patients' functional abilities, muscle strength, and balance, thus reducing fall risks. Significant progress was evident during the 2022/23 year, with a notable reduction in safety device utilization. Initially, lap belt/pelvic restraints were used by approximately 60% of patients, but by the year's end, this percentage had decreased to 4%. Notably, Pinel restraint usage remained at 0% throughout the entire 2022/23 year. These findings underscore the successful implementation of the least restraint model, highlighting enhanced patient safety and autonomy.

Conclusion: In conclusion, the interprofessional team's concerted efforts to implement a least restraint model, supported by universal falls precautions and patient-specific goals, resulted in a significant reduction in safety device utilization throughout the 2022/23 year. The decrease in lap belt/pelvic restraint usage from 60% to 4% and the absence of Pinel restraint utilization exemplify the success of this approach. By prioritizing patient-centered care and continuous education, this study demonstrates enhanced patient safety, functional abilities, and autonomy. The findings underscore the value of collaborative efforts in fostering a safer and more compassionate healthcare environment.

Treatment Pathways of Individuals Referred to Ontario Shores Long-Term Care Outreach Team

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Background/Objectives: Study Objectives: 1. To identify correlations between MND diagnoses, treatment recommendations and treatment outcomes in those referred/have open files with the GNOS team in 2022. 2. To identify if there is a correlation between type of MND diagnosis and increases in inpatient admissions at Ontario Shores

Methods: The proposed project is a retrospective chart review in which charts of MND referred to the GNOS program or with an open file during the period of Jan 2022-Dec 2022 will be reviewed to identify treatment pathways and outcomes. Service pathways for those same individuals referred to the GNOS program or with an open file in 2022 will also be identified. Prevalence of referrals of individuals with a major neurocognitive disorder (MND): This prevalence will be calculated for 3 data sets (overall prevalence, outpatients, and those who have been admitted as inpatients from outpatient services).

Results: Results pending at this time -to be determined following completion of retrospective chart review. It is hoped that results will be presented at the 11th Canadian Conference on Dementia in November 2023. We seek to determine if any of the results would provide a better understanding of treatment pathways for those with MND diagnoses and how these correlations would inform future treatment options. We expect that our evolving understanding of adaptive expertise will significantly contribute to advocacy efforts to further provide more specialized services and training for staff at Ontario's long-term care homes.

Conclusion: We seek to determine if we can gain a better understanding of MND treatment pathways and how such would inform future treatment options. We expect our evolving understanding of this topic will significantly contribute to advocacy efforts to provide specialized services and training for Ontario long-term care home staff, ultimately providing more efficient and person-centered care for Ontario's seniors.

Identifying Barriers and Facilitators of Assessing the Impact of Medication Reviews in Persons with Cognitive Impairment and Dementia in Primary Care-Based Memory Clinics: A Qualitative Study

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Background/Objectives: Optimizing medication use is particularly important in persons with cognitive impairment and dementia. Pharmacists in primary-care-based memory clinics (PCMC) are trained to conduct structured medication reviews, focusing on medication-related problems encountered in persons with dementia (PWD). Unfortunately, the impact of such reviews has not been examined previously. However, identifying barriers and facilitators before attempting a large study is crucial for designing research methods, optimizing resource allocation, setting realistic expectations, addressing ethical considerations, engaging stakeholders, and mitigating risks. Thus, this study aimed to identify these factors to inform the full-scale deployment of assessing the impact of pharmacist-led medication reviews in PCMC.

Methods: Participants were separated into groups based on their disciplines (pharmacists and physicians (n = 9), care partners (n = 4) and other health care professionals (n = 5)) to ensure all stakeholder perspectives were represented. Three facilitators conducted three focus groups with semi-structured interview questions using the tailored topic guides based on the Theoretical Domain Framework (TDF). TDF was developed to identify and understand the factors that influence the implementation of evidence-based practices by identifying the behaviour change required. It contains 14 domains. In this study, Questions covering each domain explored stakeholder perceptions of barriers and facilitators on the local operationalization of the research (e.g., ethics board approval, recruitment, data collection). Deductive coding of interview transcripts was utilized to identify and map the facilitators and barriers to TDF domains.

Results: Eighteen stakeholders were interviewed. Analysis was conducted by participant group and overall. Key facilitators were potential effects of medication review (beliefs about consequences); patient as a part of the research team, (decision processes); finding relevant area of interest (goals); procedural knowledge of the study (knowledge); recognition and acknowledgment of pharmacists' work in memory clinics (social/professional role and identity); standardization of medication review in memory clinics (skills); and adequate remuneration (reinforcement). In contrast, key barriers were lack of communication among healthcare professionals and ageism (social influences); the role of interdisciplinary staff in the study (social/professional role and identity); extra burden on the patient or caregiver, time consuming and complex data collection, loss of support and resources after the study (environmental context and resources); and the difference in parameter from a different professional perspective (goals (autonomous)).

Conclusion: This study identified barriers and facilitators and associated behaviour change interventions that should be considered when designing studies to examine medication reviews in people with dementia and cognitive impairment.

Use of Potentially Inappropriate Medication Among Older Adults with Dementia or/and Cognitive Impairment Attending Memory Clinics: a Systematic Review and Meta-Analysis

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[1]University of Waterloo, [2]University of Manitoba, [3]Kakatiya University, [4]Centre for Family Medicine FHT.

Background/Objectives: Hospital admissions among older adults with dementia are primarily attributed to drug-related problems (DRPs). Among these individuals, a primary contributor to DRPs is the use of potentially inappropriate medications (PIMs). Several studies conducted using different outcome definitions and across varying populations and geographical locations have assessed the prevalence of PIMs among patients with dementia. Until now, no study has been conducted to estimate the pooled prevalence of PIMs in this population. Thus, this study aimed to pool the overall prevalence of the PIMs, polypharmacy, and hyper-polypharmacy use among older adults with dementia attending memory clinics in any healthcare setting.

Methods: A systematic review (SR) and meta-analysis (MA) is being conducted and will be reported according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines (protocol registration on PROSPERO, CRD42023423001). Ovid MEDLINE, Ovid EMBASE, Scopus, Cochrane Library, EBSCOhost CINAHL, and Ovid International Pharmaceutical Abstracts (IPA) were systematically searched from inception to May 05, 2023. Cross-sectional studies, cohort studies, observational studies, randomized clinical trials (RCT), quasi-experimental studies, and case-control studies were included if assessing PIMs use among older adults with dementia or/and CI. Two reviewers carried out the title and abstract screening, full-text screening, and data extraction from the pertinent included publications. Two reviewers evaluated the study quality, and their results were cross-checked. The data synthesis for the meta-analysis will be performed using a quantitative method, and the data will be presented in percentages (number of patients exposed to inappropriate prescribing and/or polypharmacy/total number of study participants).

Results: The initial search yielded 5412 citations. Of 2449 screened titles and abstracts, 479 were eligible for full-text screening. Nine full-text articles and three conference abstracts were included for data extraction. Data extraction, which is currently ongoing, includes study characteristics, types of care settings, prevalence of PIMS, polypharmacy and/or hyperpolypharmacy, and factors associated with using PIMs in this population. The criteria for the data synthesis will be considered based on the number of studies reporting on the extent of inappropriate prescribing the medications and polypharmacy among the older population studied. (Research in progress)

Conclusion: The findings from this SR and MA will identify the pooled prevalence of PIMs, providing a more precise estimate of the prevalence of the PIMs in older adults with dementia who are attending memory clinics at primary, secondary, or tertiary healthcare settings by considering the results of multiple studies. This SR will collate and summarize the findings from the multiple studies reporting the prevalence of polypharmacy, hyperpolypharmacy and the factors that may contribute to the PIMs use among this population. (Research in-progress)

Knowledge Translation and Implementation of Health Quality Ontario Standards in a Specialized Behavioral Unit for Dementia

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Background/Objectives: Grand River Hospital, Kitchener-Waterloo Ontario, acquired longer term mental health beds, operational in 2010, from provincial psychiatric hospital divestment. Twelve of these beds have been allocated to a specialized behavioral unit with an interprofessional team that treats severe behavioral symptoms of dementia. Referrals are received from the Waterloo and Wellington regions in Ontario. The interprofessional team formed a working group and reviewed the current standards of care for dementia in Ontario using the Health Quality Ontario document, comparing these standards to the programs current practice, with the goal of enhancing quality of care.

Methods: An interprofessional working group was convened as part of a quality improvement initiative. The team consisted of two geriatric psychiatrists, a social worker, occupational therapist, recreation therapist, and nursing team lead. Health Quality Ontario (HQO) has developed “Quality Standards for Behavior Symptoms of Dementia Care for Patients in Hospitals and Long-Term Care Homes”(2016), with 14 Quality Statement headings each beginning with “People living with dementia and symptoms of agitation or aggression…”. This became the basis of the standards considered. Each standard was compared against our program’s current practices, noting what could be improved upon. Barriers to implementation were also explored.

Results: The working group identified several areas in which the program met or exceeded the standards of care. These included interprofessional assessments completed as a team with the person living with dementia and their family, and highly individualized nonpharmacological interventions for behaviors. Three areas were noted for improvement. First, were specific objective behavioural measurements to assess treatment outcomes. This would require increasing the capacity of the team to assess and document such behaviors using validated instruments. The second area was increasing formal caregiver support in hospital. The third was better coordination of unit activities to encourage more patient and staff engagement. The group also identified tension between falls prevention which is a focus in hospitals, sometimes requiring restraints, and a least restraint approach that supports the individual’s freedom and autonomy, however no specific solution was identified.

Conclusion: This interprofessional team approach to quality of standards review facilitated reflection on the standards, both as a team as well as from each professional member’s practice and regulatory college perspective. The results were disseminated program wide with steps underway to set up the next quality improvement cycle to implement and measure the effect of suggested improvements. We would appreciate your suggestions on these recommendations and challenge you to reflect on your own facilities and practices.

Fostering Meaningful Interpersonal Connections Through Videoconferencing: a Grounded Theory of Older Adults’ Experience in a Remotely Delivered Home-Based Intervention Study

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Background/Objectives: In the wake of the COVID-19 pandemic social distancing measures, the NB-PALM research group designed and implemented a feasibility study of remotely delivered exercise and cognitive interventions with older adults. While video conferencing technology facilitated continuity of the study throughout the pandemic and beyond, the experience of participants in remotely delivered interventions is not well studied in the literature. The objective of this grounded theory study was to understand the experience of older adults who are at risk for dementia and participated in a remotely delivered, home-based intervention combining physical exercise and cognitive training aimed at improving mobility and cognition.

Methods: Using a grounded theory approach, we conducted online semi-structured interviews in English and French with 15 participants (11 women), aged 64 to 85 years from rural and urban settings, who completed the study intervention of the SYNERGIC@Home/SYNERGIE~Chez soi feasibility trial (NCT04997681). Participants were recruited by purposive sampling of study participants who completed the 16-week home-based intervention program (3 sessions/week) of physical exercises and cognitive training, which was fully delivered using Zoom for HealthCare™. Ethics approval was obtained from the applicable Research Ethics Boards. Data analysis was completed collaboratively by qualitative team of researchers, including bilingual members, using NVIVO™ software to discover and refine concepts, codes, and core categories that make up the extracted theory. To maintain meaning associated with linguistic intricacies, French and English transcripts were analyzed in the original language. Member checking supported the developing theory.

Results: Participants described their experience in terms of fostered meaningful interpersonal connections over video conferencing. These connections were evident through three categories, namely contemplating and responding to intentional messaging during the recruitment phase of the study; engaging with the study; and making a difference. Contributing to the science to delay Alzheimer’s disease and related dementias was a common initial motive for involvement in the study. Participants responded to recruitment with a desire to learn more about the risks associated with dementia and the management of these risks. Some lifestyle behaviour changes occurred through activation of new learning and/or reinforcement of current exercise regimens. These perceived changes were associated with relationships that developed between participants and research assistants who facilitated the physical exercise component of the intervention. Participants identified perceived benefits and felt positive changes in their physical and emotional well-being.

Conclusion: The findings suggest that the quality of the interpersonal connections and personalized support are essential components of the participants’ overall positive experiences in the intervention. The detailed account of participants’ experiences obtained in this study can inform the design, implementation and scaling up of remotely delivered physical exercise and cognitive training programmes in older adults. In developing interventions remotely, as researchers and clinicians alike increasingly utilize videoconferencing technology, it is important to examine and further understand how interpersonal connections facilitate positive and productive experiences.

Perceived Barriers for the Diagnosis and Disclosure of Dementia: a National Survey of Canadian Family Physicians

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Background/Objectives: Family physicians (FP) play a key role in the diagnosis and management of dementia in Canada, yet these processes can be difficult for FP who lack time, expertise, and supportive tools. The purpose of this study was to examine the perceived barriers that Canadian family physicians (FP) report for diagnosing and disclosing dementia to their patients.

Methods: The Alzheimer Society of Canada and the College of Family Physicians of Canada conducted a cross-sectional survey in 2021 with FPs. A subset of this data was explored with qualitative analyses, focusing on open-ended survey questions on diagnosis and disclosure of dementia. The qualitative results are supported by quantitative analyses of related closed-ended survey questions. Participants were FPs registered with the CFPC and members of one of CPFC Member Interest Groups (MIGs).

Results: Qualitative analyses identified two overarching themes: Barriers to Diagnosis and Barriers to Disclosure. Within the former, four subthemes were identified including, Level of Confidence to Diagnose, Challenges with Current Diagnostic Tools, Time Constraints, and Patient and Family Resistance to a Diagnosis of Dementia. Within the latter, two subthemes were identified: Concerns About the Implications of a Diagnosis, and Physician and Family Preference to Defer to a Specialist. Supporting quantitative data is provided where available. The results of this work are directly informing the ASC and the CFPC in the development of national dementia guidelines on disclosing a diagnosis.

Conclusion: While most FPs indicated feeling confident to diagnose dementia, respondents also reported numerous barriers for diagnosis as well as for the disclosure of a dementia diagnosis. These barriers included a lack of helpful tools, possible social implications for the patient, potential harm to the FP-patient relationship, and uncertainty about how to communicate the diagnosis. These findings provide insights into the challenges that FPs face in diagnosing and disclosing dementia, and highlights opportunities to better support FPs in their dementia care for Canadians.

Plasma Phosphorylated Tau 181 for Detecting Alzheimer’s Disease Pathology in Normal Pressure Hydrocephalus Patients

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Background/Objectives: Normal pressure hydrocephalus (NPH) is a neurological syndrome that primarily affects the elderly, characterized by ventriculomegaly on neuroimaging combined with clinical symptoms of balance/gait disturbance, urinary dysfunction, and cognitive impairment. NPH is also known to coexist with other neurodegenerative diseases, particularly Alzheimer’s disease (AD). The altered CSF dynamics in NPH makes using CSF AD biomarkers to determine concurrent AD in an NPH patient challenging. In this study, we use a plasma phosphorylated tau 181 (p-tau) cutoff value to group the cohort as plasma AD+ and AD-, and using these groups, we compare their CSF biomarker levels.

Methods: 34 patients with NPH from the Toronto Western Hospital (Toronto, Canada) with CSF and plasma were included. Plasma p-tau was analyzed on SR-X single molecular array (Simoa). Patients were grouped following a plasma p-tau AD positivity cutoff: AD+ as p-tau > 2.2 pg/mL, and AD- as p-tau ≤ 2.2 pg/mL. CSF neurofilament light chain (NfL) and glial fibrillary acidic protein (GFAP) were also analyzed on SR-X Simoa. CSF AD biomarkers (p-tau, total tau (t-tau) and beta-amyloid 42 (Abeta42)) were analyzed using sandwich enzyme-linked immunosorbent assay (ELISA). For statistical analysis, the Mann-Whitney U test was used to compare variables, and the Spearman rank correlation test was used to investigate associations.

Results: Eighteen (53%) patients were AD+, while 16 patients (47%) were AD-. Age and sex were not significantly different between groups. CSF NfL levels were significantly higher in the AD+ group compared to the AD- group (1402.3+/-566.9 vs 1032.9+/-456.2, $p < 0.05$). CSF GFAP levels were also significantly higher in the AD+ group (32,177.6+/-12,554.2 vs 20,464.5+/-8,169.7, $p < 0.05$). There was no significant difference in CSF p-tau and CSF t-tau levels between groups; however, CSF Abeta42 levels were significantly lower in the AD+ group (347.4+/-204.7 vs 480.7+/-190.6, $p < 0.05$). No correlations were found between CSF p-tau or CSF GFAP and plasma p-tau in either group. A strong significant correlation was found between CSF NfL and plasma p-tau in the AD+ group ($R = 0.60$, p-value < 0.05), but no correlation was present in the AD- group.

Conclusion: We provide results that support further investigation into the use of plasma biomarkers for detecting AD co-pathology in patients with NPH. Our results are in keeping with pathological series that demonstrate that 50-60% of patients with NPH harbour AD pathology at various stages. Further investigation with PET amyloid and post-mortem confirmation is warranted to validate these results.

Awareness of Dementia Risk Factors Among Adults in Canada

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Background/Objectives: Up to 40% of dementia cases may be attributed to modifiable risk factors, such as high blood pressure, obesity, physical inactivity, and hearing loss. This finding highlights an opportunity for impactful prevention and intervention strategies. However, for this to become a reality, the public needs to be aware of the conditions that can increase dementia risk. Data from other countries suggest that the general population has limited knowledge about dementia risk factors. However, such information is currently lacking in Canada. Therefore, this study aimed to quantify awareness of risk factors for dementia in Canada.

Methods: We designed a short online survey to examine knowledge of dementia risk factors. The first section of the survey asked about demographic information (e.g., age, sex, gender, level of education, ethnicity, race, area of residence). The main part of the survey assessed knowledge of dementia risk factors. Participants were presented with a list of 33 conditions and were asked to indicate whether each condition was associated with an increased risk of developing dementia. Response options included: "True", "False" or "Don't Know". Among the 33 conditions, there were 20 true dementia risk factors (e.g., hypertension, smoking, physical inactivity, depression, diabetes) and 13 false risk factors, known to not be associated with dementia (e.g., use of over-the-counter painkillers, arthritis, chickenpox). Multiple linear regression models examined the association of demographic characteristics with knowledge of risk factors, quantified as the percentage of true risk factors correctly identified. Covariates included age, sex, and education.

Results: 4411 participants completed the survey (mean age: 62±15, 70% female). Most participants self-identified as White (80%), followed by South Asian (7%). Additionally, 87% completed post-secondary education, 91% resided in urban areas, and 25% work/worked in a healthcare setting. On average, participants accurately identified 40% (8/20) of true risk factors. The best known risk factors included: having a parent with dementia (76%), previous head injuries (71%), physical inactivity (63%), and heavy alcohol use (60%). The least known risk factors included: chronic kidney disease (15%), low level of education (17%), air pollution (17%), being a woman (21%), and gingivitis (22%). Factors such as older age ($\beta=-0.28$, $p<0.001$), male sex ($\beta=-4.39$, $p<0.001$), lower educational attainment ($\beta=-8.81$, $p<0.001$), and absence of healthcare employment ($\beta=-10.79$, $p<0.001$) were associated with lower knowledge of risk factors. Level of knowledge did not differ by ethnicity (White vs. South Asian, $\beta=-1.07$, $p=0.499$) or residence (rural vs. urban, $\beta=0.26$, $p=0.843$).

Conclusion: There was a notable lack of awareness regarding dementia risk factors, despite many participants being highly educated and a considerable number having a background in healthcare. These preliminary findings underscore the need for campaigns aimed at educating Canadians about dementia risk factors. One limitation of this study was the lack of diversity in our sample. Future recruitment efforts aim to increase the diversity of the sample. This shift will allow us to delve deeper into demographic differences regarding knowledge of dementia risk factors.

Comparing the Montreal Cognitive Assessment (MoCA) and the Rowland Universal Dementia Assessment Scale (RUDAS) in Diverse Populations

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Background/Objectives: Cognitive screening tools such as the Montreal Cognitive Assessment (MoCA) and Rowland Universal Dementia Assessment Scale (RUDAS) are used to help evaluate patients with cognitive complaints. Despite linguistic and cultural modifications, it is suggested that the MoCA is still not properly adjusted to screen local populations around the globe. In contrast, the RUDAS was developed to reduce bias from sex, language, and education. The objective of the study was to determine if the MoCA and RUDAS are influenced by sociocultural factors, and to explore which cognitive test is more appropriate to use in across different cultures and backgrounds.

Methods: Both the MoCA and RUDAS were administered at baseline visits for a subsection of participants enrolled in the Prospective Registry of Persons with Memory Symptoms (PROMPT). Demographic information including sex, race, first language, and level of educational attainment were also collected from each patient. The MoCA and RUDAS scores with consideration of patients' sex, race, first language, and level of educational attainment were compared using the Kruskal-Wallis test. A linear regression was also performed which was adjusted for patient outcome.

Results: Males and females did not score differently on the MoCA (median:21 [IQR:9] vs 20 [12.5], p = 0.10) and the RUDAS (25 [7] vs. 23.5 [7], p = 0.29). Patients who were White and patients from ethnic minorities also did not score differently on the MoCA (21 [9] vs. 19.5 [11.5], p = 0.067) and the RUDAS (24 [7] vs. 25.5 [10.5], p = 0.076). Similarly, native English speakers and non-native English speakers did not score differently on the MoCA (21 [11] vs 20.5 [11], p = 0.90) and the RUDAS (24 [7] vs. 25.5 [10.5], p = 0.57). Patients with a lower levels of education scored lower on the MoCA (17 [10.5] vs. 17.5 [9] vs. 24 [8], p = 0.002). In contrast, patients scored the same on the RUDAS regardless of education (23 [4] vs. 22.5 [8] vs. 26 [7], p = 0.18).

Conclusion: The Kruskal-Wallis test and linear regression analysis did not indicate differences in cognitive test scores for sex, race, and first language. Education finding were consistent with current literature in that RUDAS scores were not significantly different across different levels of education. In contrast, lower MoCA scores lower was associated with lower levels of education. As a result, findings suggest that further research is required to understand how diversity impacts the performance of neurocognitive assessment tools in detecting cognitive impairment and dementia.

Association of Montreal Cognitive Assessment (MoCA) and Rowland Universal Dementia Assessment Scale (RUDAS) Cognitive Testing Profiles with Cortical Atrophy and White Matter Disease

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Background/Objectives: The Montreal Cognitive Assessment (MoCA) and Rowland Universal Dementia Assessment Scale (RUDAS) are commonly used cognitive screening tools to inform physician diagnosis in patients with cognitive complaints. While the overall test scores are used to quantify cognitive performance and help determine if a patient has mild cognitive impairment (MCI) or dementia, it is unclear whether these scores can also help inform physicians of potential underlying neuroimaging abnormalities. We sought to determine whether different cognitive testing profiles can be associated with specific neurological mechanisms of cognitive decline including Alzheimer's disease, Lewy Body Dementia, Frontotemporal Dementia, or Vascular dementia.

Methods: The MoCA and RUDAS were administered during baseline visits for patients in the Calgary Cognitive Neurosciences Clinic. MRI and PET imaging were ordered according to standard care. The MRI scans were used to rate severity of global cortical atrophy (GCA) and both periventricular and deep white matter hyperintensities (WMH) on the Fazekas scale. Ratings were grouped into no atrophy/WMH, mild atrophy/WMH or moderate to severe atrophy/MWH. PET scans assessed hypometabolism in the frontal, parietal, temporal, and occipital lobes. Imaging results were then related to median scores for individual cognitive domains on the MoCA and RUDAS using a Kruskal-Wallis test.

Results: Among 147 patients, 139 had MRI scans and 82 had PET scans. Patients with more severe GCA had lower MoCA visuospatial and executive function scores (median: 4 [IQR:2], 3 [3], 3[2], p = 0.047). Patients with moderate to severe periventricular WMH had lower RUDAS visuoconstructional drawing scores (none: 3 [1], mild: 3 [1], moderate-to-severe: 2[2], p = 0.013). RUDAS judgement scores were also lower for moderate to severe deep WMH (none: 4 [1], mild: 4 [1], moderate-to-severe: 2.5 [2], p = 0.031). Total RUDAS scores were lower in patients with more severe GCA, periventricular and deep WMH (25 [7], 24 [6], 22 [5], p = 0.028; 25.5 [6], 25 [6], 22 [6], p = 0.0094; 25 [6], 25 [7.5], 21 [6], p = 0.0027).

Conclusion: Cognitive testing profiles may predict some mechanisms of cognitive impairment. The visuospatial and executive functioning components of the MoCA and RUDAS were associated with different severities of GCA, periventricular WMH, and deep WMH in a cognitive clinic sample. Additionally, the total RUDAS score was associated with the severity of atrophy and WMH. These findings further demonstrate the usefulness of these cognitive tests in screening for pathological findings in patients with cognitive complaints.

Comparing the Montreal Cognitive Assessment (MoCA) and Rowland Universal Dementia Assessment Scale (RUDAS) for the Detection of Dementia

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Background/Objectives: The Montreal Cognitive Assessment (MoCA) and the Rowland Universal Dementia Scale (RUDAS) are cognitive screening tools used to detect dementia. The MoCA is a 30-point test with a cut-off score indicating a positive result of 17 and the RUDAS is a 30-point test with a cut-off score of 22. While the RUDAS is proposed to be less influenced by culture and education, it is suggested that the diagnostic performance between the RUDAS and the MoCA are still comparable. Therefore, the objective of the study was to compare the diagnostic ability of the MoCA and RUDAS to detect dementia.

Methods: Baseline MoCA and RUDAS scores for patients in the Cognitive Neurosciences Clinic who were enrolled in the Prospective Registry of Persons with Memory Symptoms (PROMPT) were included in this analysis. The independent reference standard diagnosis of dementia was made retrospectively by two physicians based on chart review of other standard clinic assessments (including the Consortium to Establish a Registry for Alzheimer's Disease neuropsychological test battery and the Lawton-Brody scale of activities of daily living), blinded to MoCA and RUDAS information. The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of both cognitive scores were compared.

Results: A total of 119 patients in the PROMPT registry were administered both the MoCA and RUDAS at baseline visits. When using MoCA scores ≤17 to predict dementia, the cognitive test had a sensitivity of 62.5% [CI: 48.4-74.8], specificity of 77.5% [66.5-85.6], PPV of 65.2% [50.8-77.3], NPV 75.3% [64.4-83.8] and an accuracy of 71.4% [62.7-78.8]. In comparison, when using RUDAS scores ≤22 to predict dementia, the cognitive test had a sensitivity of 64.6% [50.4-76.6], specificity of 77.5% [66.5-85.6], PPV of 66.0% [51.7-77.8], NPV of 76.4% [65.4-84.7], and an accuracy of 72.3% [63.6-79.5]. When comparing the screening test result between the cognitive tests, the difference in sensitivity was 2.1% [-16.7-20.6], specificity difference was 0.0% [-13.7-13.7], difference in PPV was 0.7% [-18.0-19.4], difference in NPV was 1.1% [-12.8-14.8], and the difference in accuracy was 0.8% [-11.4-13.0].

Conclusion: 119 unique patients with cognitive complaints had both MoCA and RUDAS administered at baseline and had medical records available on Connect Care. An independent reference standard established by two physicians blinded to MoCA and RUDAS information based on chart review from Connect Care records. The RUDAS had similar sensitivity, specificity, PPV, NPV, and accuracy compared to the MoCA. As a result, the RUDAS performed the same as the MoCA when detecting dementia. The results suggest that the RUDAS is a reasonable alternative to the MoCA.

Investigating the Impact of Hypertension with and Without Diabetes on Progression to Alzheimer's Disease: a Clinico-Pathological Study

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Background/Objectives: Hypertension and diabetes are two common cardiovascular risk factors which are associated with an increased risk of Alzheimer's disease (AD) dementia. However, it is unclear whether there are differential risks of AD in hypertensive individuals with and without diabetes. Understanding the clinical and neuropathological implications of individuals having hypertension with and without diabetes is critical for informing the development of personalized treatments that can effectively reduce the risk of AD. Here, we investigated the risk of progression from cognitively normal to clinically-diagnosed AD in hypertensive individuals with and without diabetes.

Methods: Cognitively normal individuals from the National Alzheimer's Coordinating Center dataset were categorized into one of three groups based on the presence or absence of hypertension and/or diabetes: 1) hypertension with diabetes (HTN+/DM+) (N=1432), 2) hypertension without diabetes (HTN+/DM-) (N=5034), or 3) neither hypertension nor diabetes (HTN-/DM-) (N=4608). The main aim of this study was to investigate whether HTN+/DM+ or HTN+/DM- were predictors of progression to clinically-diagnosed AD compared to HTN-/DM-. This aim was then investigated in a post-mortem sample of individuals (N=919) who had neuropathologically-confirmed AD (ADNP), cerebral amyloid angiopathy (CAA), cerebrovascular neuropathology (CVNP) as defined by microinfarcts/macroinfarcts/lacunes, arteriosclerosis and atherosclerosis. This allowed for the investigation of the contributing neuropathologies involved in increasing AD risk. For the exploratory analysis, individuals with HTN-/DM+ (N=272) were identified, and their risk of progression to AD compared to HTN-/DM- was investigated.

Results: This study included N=11074 cognitively normal individuals [mean age (standard deviation): 71.7 (9.0), MMSE: 28.9 (1.4), male: N=3818 (34%)]. The average duration of follow-up was 5.2 (3.6) years, and 7% (N=830) progressed to AD. Both HTN+/DM+ (hazard ratio (HR) = 1.31, p<.001) and HTN+/DM- (HR = 1.24, p<.001) were significant predictors of progression to AD. The post-mortem sample demonstrated that AD risk was greater in HTN+/DM+ with ADNP (HR = 2.10, p=.01) and CAA (HR = 1.52, p=.01), and was greater in HTN+/DM- with CVNP (HR = 1.54, p=.002). HTN-/DM+ was also associated with an increased risk of AD (HR = 1.88, p<.001), however we were unable to investigate underlying neuropathology in this group due to a small sample size.

Conclusion: These findings demonstrate that HTN+/DM+ and HTN+/DM- are each associated with an increased risk of AD. In those with HTN+/DM+ both ADNP and CAA contributes to AD risk, while in those with HTN+/DM- underlying CVNP contributes to AD risk. This suggests that individuals with HTN+/DM+ and HTN+/DM- vary phenotypically and different treatment strategies may be warranted to reduce the future risk of AD.

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evoke and evoke+: Design of Two Large-Scale, Double-Blind, Placebo-Controlled, Phase 3 Studies Evaluating the Neuroprotective Effects of Semaglutide in Early Alzheimer's Disease

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Background/Objectives: Preclinical, clinical, and real-world evidence suggest benefits in Alzheimer's disease (AD)-related symptoms and reduced risk of dementia in type 2 diabetes following treatment with glucagon-like peptide-1 receptor agonists (GLP 1RAs). The two randomized, double-blind, placebo-controlled phase 3 evoke and evoke+ trials (NCT04777396 and NCT04777409, respectively) are recruiting across 38 countries (with two further countries pending), and will assess the efficacy and safety of the oral

GLP-1RA semaglutide vs placebo in participants with early AD. Here, we present the design of these trials.

Methods: In each trial, 1,840 amyloid-positive participants (aged 55-85 years) with mild cognitive impairment (MCI) due to AD (Clinical Dementia Rating [CDR] global=0.5) or mild AD dementia (CDR global=1.0) will be randomized (1:1) to once-daily oral semaglutide 14 mg or placebo for 156 weeks. Other key inclusion criteria are: Mini-Mental State Examination score ≥22 and Repeatable Battery for the Assessment of Neuropsychological Status delayed memory index score ≤85. In evoke+, participants with significant small vessel co-pathology will be included. The primary endpoint is change in the CDR-Sum of Boxes score from baseline to week 104. Confirmatory secondary endpoints are change in Alzheimer's Disease Cooperative Study-Activities of Daily Living-MCI score, and time to progression to dementia among participants with MCI at baseline. Exploratory endpoints include changes in plasma and cerebrospinal fluid biomarkers of neuroinflammation and neurodegeneration. After week 104, a 52-week extension phase, followed by a 5-week follow-up, is planned.

Results: The evoke and evoke+ read-outs are expected in 2025.

Conclusion: evoke and evoke+ will be the first large-scale phase 3 trials (Ntotal=3,680) to investigate the hypothesized neuroprotective disease-modifying effect of semaglutide in early AD.

Investigating Changes in Fluid Biomarkers in Early Alzheimer's Disease: Design of Plasma Biomarker Analyses and a Cerebrospinal Fluid Sub-Study in the evoke and evoke+ Trials of Semaglutide vs. Placebo

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Background/Objectives: Several studies support a role for glucagon-like peptide 1 receptor agonists (GLP-1RAs) in Alzheimer's disease (AD). In animal models of AD, GLP-1RAs reduced neuroinflammation and provided neuroprotective effects, and improved cognitive function. In patients with AD, GLP-1RAs preserved cerebral glucose metabolism, favorably affected cognition and cortical volume, and in post-hoc analyses of randomized clinical trials in type 2 diabetes, reduced cognitive impairment and dementia risk. The phase 3 evoke and evoke+ trials (NCT04777396 and NCT04777409) will assess the efficacy and safety of oral semaglutide (a GLP-1RA) vs placebo in early AD. Here, we describe how fluid biomarkers will be investigated.

Methods: Participants in the randomized, double-blind, placebo-controlled evoke and evoke+ trials (N=1,840 per trial) will be randomized 1:1 to once-daily oral semaglutide 14 mg or matched placebo for 156 weeks. The primary endpoint is change in Clinical Dementia Rating Scale - Sum of Boxes score from baseline to week 104. In both studies, fluid biomarkers will be measured in plasma (all participants [except those in China]) and cerebrospinal fluid (CSF) (a sub-set of participants [CSF sub-study]). For plasma biomarkers, blood samples will be collected at baseline and weeks 52, 104, and 156. For CSF biomarkers, samples will be collected before randomization and at week 78, aiming for around 210 consenting participants. In each trial, participants will be stratified by CSF sub-study participation (yes/no) to ensure 1:1 randomization in the sub-study population. The range of biomarkers analyzed will encompass markers of AD, neuroinflammation, neurodegeneration, blood-brain barrier integrity, oxidative stress, and vascular integrity.

Results: Results from the plasma biomarker analyses and CSF sub-study of the evoke and evoke+ trials are expected in 2025.

Conclusion: These analyses of the evoke and evoke+ studies will investigate the effects of semaglutide on fluid biomarkers in participants with early AD. The analyses will provide insights into the mechanism of action of semaglutide on neuroinflammation and neurodegeneration (and the relationship between the two) in this population.

Impact on Caregivers of Nighttime Wandering Technology for Persons Living with Advancing Dementia

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Background/Objectives: Nighttime wandering is a serious issue for persons living with advancing stages of dementia (PLWAD), affecting their safety, but also the sleep of caregivers (CG). Smart home technology can be modified to improve nighttime safety and hopefully improve sleep of the CG. The objective of this project was to determine if there were measurable impacts of nighttime smart technology on symptoms of depression or anxiety, and quality of sleep in CGs of PLWADs.

Methods: Adapted Samsung SmartThings home technology, pressure mats, and Sonos speakers were installed in the bedrooms of some 20 PLWAD. The Hospital Anxiety and Depression Scale, a modified Mini-sleep questionnaire, and a short technology satisfaction questionnaire were administered to CG at baseline and after 12 weeks of technology use. Fourteen dyads completed over 10 weeks of technology use in their homes over the period July 2017 to August 2019. Four of the PLWAD were female (28.6%) and the average age of the PLWAD was 78.3 (59-98). Ten of the caregivers were female (71.4%) and the average age of the CGs was 68.6 (47-84).

Results: The mean CG depression score went from 7.21 (+/-3.4) to 6.21 (+/-3.7) with 8 showing an improvement and 4 showing a decline. The mean CG anxiety score went from 9.21 (+/-4.0) to 8.21 (+/-3.8) with 6 showing an improvement and 3 showing a decline. The number of continuous sleep hours went from 4.29 (+/-1.9) to 4.57 (+/-1.5) with 7 showing an improvement and 4 showing a decline. None of these changes reached statistical significance. Regarding satisfaction: all 14 caregivers thought that the system could enhance PLWAD safety, 11 felt it reduced their stress and 8 felt it improved their quality of sleep.

Conclusion: Nighttime wandering has a significant impact on PLWAD and CGs. Technology has the potential to reduce risk to the PLWAD and improve wellbeing for the CG. This study showed trends in reducing symptoms of depression/anxiety and increasing continuous hours of sleep in CGs. Overall CGs were satisfied with the technology. Factors that need to be considered include: this is a small, preliminary trial; the technology did not always work as expected; and the PLWAD typically progressed in their care needs over the time of the trial. Some of these could have affected mood and sleep in CGs.

Developing a User Interface to Provide Sensor Information on the Daily Activities of Care Partners of People Living with Cognitive Impairment

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Background/Objectives: Technologies in the home have the potential to provide information on the daily activities of a care partner living with an individual with cognitive impairment. Knowledge about changes in daily activities that are associated with higher levels of stress and burden could be valuable to care partners to make proactive changes to improve their health and reduce stress. To provide useful information from these technologies, a method to view and interpret the data is required for care partners. In this study, a user interface visualizing sensor data was developed, and care partner opinions were collected.

Methods: A web-application user interface was designed to present care partners with daily and weekly metrics that relate to care partner activity and engagement (sleep, step count and time spent in various rooms in their home). In this study, participants, recruited from the community, accessed a 4-week simulated data set via the interface. The goal was to collect information on the potential utility, ease of use and interpretability of this type of data. The web-application was designed to simulate data that would be obtained from sensors in a user's home technology platform. This information is visualized graphically and numerically, providing users with daily and weekly views. At study onset, participants were observed completing usability testing tasks, and then completed the System Usability Scale. At the study end, they were interviewed and asked to provide their feedback on the application. This included thoughts on usability and overall expression of the information.

Results: Three female care partners (age range: 57-71, mean: 64) of individuals with dementia (2 spousal, 1 child), used the application for 4 weeks. Participants wished for a more visually pleasing, modern application design. All participants liked the clarity and conciseness of the daily sleep and step count displays; however, they expressed difficulty in interpreting the room occupancy and weekly sleep display. The weekly step count graph was described as user-friendly and easy to navigate. Challenges were also experienced navigating between daily and weekly view. Revisions based on participant feedback included a dashboard layout with navigation bar, widgets for activity metrics, an interactive calendar, neutral background colours, and metric-specific icons. Personalized features including a welcome message and the inclusion of user-focused tooltips help connect a care partner to their health data. The room occupancy data display was adjusted for clarity, and the weekly sleep graph was simplified by restructuring its layout.

Conclusion: This study investigates care partners' feedback on the usability of a web application, displaying data for their daily caring-related activities. Based on feedback consistent among the three participants, we implemented several design and functional adjustments to the application. Next, we plan to test additional participants with the new interface to assess if our changes represent improvements in ease of use and interpretability of the data. Our goal for future projects is to integrate real data from home sensors to provide care partners with real-time feedback.

Behavioural Supports Clinical Navigation: Improving Care from a Systems to Referral Level

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Background/Objectives: Toronto Central (TC) Region's Behavioural Supports Ontario (BSO) programs have expanded in response to a growing need for behavioural supports for clients living with dementia. Formed in 2020, the Behavioural Supports Coordinating Office set out to meet the growing demand by centralizing system level flow and triage, and optimizing continuity of care and transitions between sectors. Staffed by Clinical Navigators and Administrative staff, the Office has expanded due to its success and impact.

Methods: Grounded in the BSO's three foundational pillars of: system coordination, integration, and capacity building, the Office started with a system navigation Hotline to support families and healthcare providers. The Office quickly grew to become the centralized intake service for all TC Region BSO programs in Community, Acute Care, and LTC (including Geriatric Addictions, and LTC Caregiver Specialist), as well as the central intake and triage for the Virtual Behavioural Medicine program (a unique initiative that supports responsive behaviours virtually throughout Ontario). Seeing the complexity of referrals sent to the Office, a further expansion took place to include a Complex Case Resolution Table (CCRT), and expanded to support Acute Care collaboratives and ALC tables to support transitions. To align with this role as centralizing support in the region, as of April 1, 2023, the TC BSO, which services TC's 5 subregions, has moved towards a "One Team" care model.

Results: The "One Team" care model was a significant movement away from its previous model in which BSO clinicians serviced only one sector. This model now allows clinicians to move between community and LTC. This change has resulted in expanding the team by an additional 18.0 FTE. These new roles include expanding the Coordinating Office with 1 Clinical Leader, 3 Clinical Navigators, 1 new Administrative Secretary, 1 Research Coordinator and an RN Educator to support expanding and centralizing services across sectors in the region. In the last reporting fiscal year alone, the Office processed 2274 referrals for all BSO programs, and addressed 486 BSO Hotline contacts requesting information and guidance in clinical system navigation (in all sectors). Within the 2022 calendar year, the Office has coordinated and led 15 CCRTs in LTC and Community in support of resolving complex clinical cases.

Conclusion: Starting as a system navigation Hotline in 2020, the Behaviour Supports Coordinating Office has become a central resource to provide wrap-around behavioural support and triage in the TC Region, as well as supportive resources for behavioural system navigation beyond the TC Region. Furthermore, the One Team Model of Care has not only allowed for ease of communication across the continuum of care but has also helped solidify the role of the Coordinating Office to address service gaps and provide comprehensive system navigation for each referral and patient.

The Comprehensive Approach to Dementia Data Monitoring in Canada (CADDM) Project: Identifying and Improving the Experiences of People Living with Dementia Across a Continuum of Care

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Background/Objectives: We do not have a comprehensive understanding of Canadians living with dementia. Current surveillance systems capture the number of Canadians living with dementia stratified by age and sex but do not reflect the heterogeneous nature of this condition or experiences of those living with dementia. The Comprehensive Approach to Dementia Data Monitoring in Canada (CADDM) project aims to enhance the current surveillance system by tracking factors that can impact people's experience living with dementia. This began with a realist review of literature that allowed for a rigorous systematic approach to data gathering while incorporating qualitative analysis techniques for data synthesis.

Methods: All types of evidence are of value in a realist review, but must be categorized based on their quality so that future surveillance efforts can focus on factors with the most robust data. Factors related to the experience of living with dementia span individual, social, structural, and environmental domains. These include factors such as culture, social support, well-being, geographic location and healthcare system fragmentation that can affect the experience of living with dementia. Our findings were then tested against middle-range theories about how people experience dementia. The information gathered was used to create a more comprehensive and holistic model of dementia that will inform national data surveillance efforts. Data analysts will apply factors to current data holdings with the aim of triangulating populations of people living with dementia most at risk of poorer experiences and scarce support.

Results: The next step in this project is taking what is learned from this holistic model of dementia and integrating it into practice. Healthcare workers play an integral role in not just the identification and diagnosis of dementia, but their ability to provide opportunities for health and social support across a continuum of care post-diagnosis. A better understanding of the supports needed, who will benefit, and who is most in need will aid healthcare workers' ability to provide timely and appropriate health and social support to people recently diagnosed with dementia.

Conclusion: This increased awareness and knowledge of people's needs and what supports are most valuable to them will help to improve the experience of people living with dementia. A surveillance system based on this model, and the integration of findings into health and social care, will help create a clearer picture of the experiences of people living with dementia in Canada and identify areas where interventions or programs can be implemented. Directing funds toward populations most at risk of poorer experiences will enable supports and services to be used most effectively to improve people living with dementia's quality of life.

Caregivers are Essential: How Essential Care Partner Programs Support Dementia Care

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Background/Objectives: Caregivers are essential and provide physical, emotional, and cognitive support, especially to those living with dementia. COVID-19 restrictions uncovered the risks to patients/residents and the health system when caregivers cannot participate in care. For dementia patients/residents in long term care homes, caregiver restrictions resulted in physical, functional, and cognitive changes and increased behavioral disturbances. When caregivers are included, it improves patient/resident outcomes and creates a better experience for staff and caregivers. Essential Care Partner programs involve the implementation of policies and practices, so caregivers are identified, included, and supported as part of the care team

Methods: When the pandemic started, the Ontario Caregiver Organization (OCO) worked with health system partners to create a multi-sector Learning Collaborative, to enable the safe presence of caregivers in health care settings. This Learning Collaborative continues to support partners interested in building a culture that values and recognizes caregivers as care partners. The Essential Care Partner Support Hub, aims to achieve greater consistency in how caregivers are identified, included and supported as essential care partners across care settings, initially focusing on hospitals and long-term care homes. As health care settings implement Essential Care Partner programs, the Support Hub will provide guidance, coaching, resources and learning opportunities for organizations.

Results: The integration of caregivers as part of the care team has a positive impact on patient/resident wellbeing, including those with dementia. Such benefits include improved patient/resident outcomes, and better experience for staff and caregivers. Caregivers act as advocates for patients/residents, ensuring their preferences and choices are respected, leading to higher patient/resident satisfaction and a sense of dignity in care. Excluding caregivers in healthcare settings negatively impacts the patient/resident, their family, staff, the care setting, and the health system. When caregivers are not included as part of the care team, staff report increased workloads as more time is spent providing social support, updating families, and responding to basic needs (assisting with meals, toileting etc.). When caregivers are not included, healthcare providers can also experience secondary trauma, increased psychological, emotional distress, anxiety and depression due to not having the resources or ability to provide high quality care.

Conclusion: Implementing Essential Care Partner programs and leading practices enables the presence and inclusion of caregivers at point of care, which can have a positive impact on the patient/resident and healthcare team experience, especially for those living with dementia. Essential Care Partner programs aim to achieve greater consistency in how caregivers are identified, included and supported across care settings, and provides numerous benefits including improved quality of care, patient outcomes and health quality indicators. This presentation will provide an overview of Essential Care Partner programs, leading practices, and offer tools for care settings to implement an Essential Care Partner program.

Navigating Dementia NB: Piloting a Patient Navigation Program for People with Dementia, Their Care Partners, and Members of the Care Team

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Background/Objectives: Dementia care is often fragmented, uncoordinated, and difficult to navigate. Patient navigation (PN) is one approach that may assist people with dementia and their care partners. Navigating Dementia NB/ Naviguer la démence NB is a research project that piloted a PN program in New Brunswick (NB) for people with dementia (PWD) living in the community, their care partners, and the care team. This PN program aimed to proactively guide and support patients and their families through health and social care systems, matching client needs to appropriate services and resources.

Methods: The main goals of this PN program are to increase the knowledge of health and social services and resources related to dementia care, and to improve access to these services and resources through in-person and online patient navigation. This PN program included six patient navigators (4 anglophone and 2 francophone) embedded in preexisting primary care clinics/community health centres in urban and rural settings across NB. A mixed methods approach is being used to evaluate the program, which was piloted for 12 months (July 2022-July 2023). Data for this evaluation is being collected from patient navigator charts, satisfaction surveys, and semi-structured interviews with participants and stakeholders involved in creating and implementing the program.

Results: Across sites, 150 participants (PWD and their care partner) took part in the study. Care partners were typically the spouse (60%) or the child (30%) of the PWD. Most participants were referred to the program by the Alzheimer Society NB (39%) or by self-referral (19%). Most participants reported having a primary care provider (91%) and 51% reported seeing a geriatrician or neurologist. Fifty-six participants completed post-intervention surveys. Survey data indicate that 82% of these participants were satisfied with services from the program. Seventy-eight percent of participants reported having greater knowledge of health and/or social services and resources because of the patient navigator and 76% of participants reported having greater access to health and/or social services and resources. Thirty-seven participants completed post-intervention interviews. Analysis of participant interviews is underway to explore participant experiences with the PN program, as well as facilitators and barriers to implementation.

Conclusion: Preliminary results suggest that PN, embedded in existing primary care clinics/community health centers, is beneficial for PWD and their care partners. This intervention has helped improve knowledge of, and access to services and resources for PWD and their care team, and participants were satisfied with their experience with the PN program. These findings support our aim to promote positive experiences with health and social care systems for this population by improving communication pathways that promote the integration of care.

A Systematic Review and Meta-Analysis of Reperfusion Therapies in Stroke Patients with Dementia and Cognitive Impairment

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Background/Objectives: The benefit of reperfusion therapies such as endovascular thrombectomy (EVT) and intravenous thrombolysis (IVT) is unclear in patients with pre-stroke dementia or cognitive impairment. Although these individuals make up ~12% of acute stroke patients, they are often excluded from landmark stroke trials. We performed a systematic review and meta-analysis to explore the outcomes of these therapies in this population group.

Methods: Conforming to the Meta-Analysis of Observational Studies in Epidemiology (MOOSE) guidelines, this systematic review investigated studies on acute ischemic stroke patients with pre-stroke dementia or cognitive impairment treated with either IVT or EVT. Primary outcome was defined as a favorable 90-day outcome (modified Rankin Scale score 0-2 indicating functional independence). Secondary outcomes included 90-day mortality, symptomatic intracranial hemorrhage (SICH) and radiographic intracranial hemorrhage (ICH).

Results: Of 825 screened articles, 9 articles were identified. For the meta-analysis, 5 observational studies of IVT use in patients with (n=1078) and without dementia (n=2805) were selected. We found no significant differences in the primary favourable outcome (adjusted OR 0.61, 95% CI 0.24 to 1.59), or any of the second outcomes including 90-day mortality (unadjusted OR of 1.19, 95% CI 0.86 to 1.64), ICH (unadjusted OR 1.32, 95% CI 0.79 to 2.19) and symptomatic ICH (unadjusted OR of 0.94, 95% CI 0.70 to 1.25). One study examining EVT use in patients with dementia found no significant differences in outcomes apart from an increased odds of ICH (adjusted OR 1.57 95CI% 1.03 to 2.40). For those with cognitive impairment, a pooled analysis of three IVT studies showed no significant association with all assessed outcomes, whereas a study of EVT found an association with poor 90-day outcomes (mRS 3-6).

Conclusion: The results of this systematic review and meta-analysis suggest that the use of IVT or EVT for patients with pre-existing dementia or cognitive impairment, compared to those without, does not carry considerable safety concerns. There is still uncertainty in the efficacy of these therapies in this demographic. Therefore, future studies that include a rigorous, patient-caregiver informed design, and a more nuanced outcome measurement approach are warranted. REGISTRATION: URL: https://www.crd.york.ac.uk/PROSPERO/; Unique identifier: CRD42021240499.

A Qualitative Study of the Acute Stroke Management and Patient-Caregiver Perspectives for People Living with Dementia

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Background/Objectives: Whereas the beneficial effect of thrombolysis and endovascular thrombectomy has been well established in certain populations, uncertainties remain regarding the decision to employ stroke therapies in people living with dementia (PLWD). Little is known about physician practices in the stroke care of PLWD, leading to limited understanding of their experiences and decision making. This study aims to explore physician, patient and caregiver perspectives on acute stroke care in this population through a series of in-depth interviews.

Methods: This study employs a qualitative descriptive methodology with 2 sets of 20 semi-structured interviews. The first set interviews physicians who interact with these patients in the acute stroke phase to explore their perspectives on the management of these patients, their interpretation of the current evidence and perceived gaps in evidence, as well as how they envision this field evolving in the future. Interviews with patient-caregiver dyads investigate their experiences, priorities, and attitudes towards stroke care. Participants for both will be recruited through snowball sampling and interviews will be analyzed through qualitative data analysis software.

Results: Initial analyses of the physician interviews have been completed, revealing themes such as a need for high quality registries and observational studies before or instead of randomized controlled trials, increasing stroke unit capacities to accommodate this population group, and the importance of patient prognosis when weighing treatment options. For the dyad interviews, themes of independence, uncertainty about the future, and fears of another stroke have emerged. Both sets of interviews have highlighted the priority of returning to baseline function as an ideal poststroke outcome for individuals with pre-existing dementia.

Conclusion: With an aging population, stroke teams will likely encounter more PLWD. Therefore, exploring physician perspectives on acute stroke care in this population is vital for identifying gaps in the literature and creating optimized care strategies. The findings from these interviews, paired with the results of the parallel study investigating patient-caregiver perspectives will provide a holistic understanding of acute stroke care in this patient population. Consequently, the results will be relevant to a broad audience, including patients, caregivers, physicians, researchers, and policymakers.

Identifying a Brief Neuropsychological Test Battery Associated with Alzheimer's Disease Pathology

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Background/Objectives: Identifying neuropsychological measures that efficiently detect cognitive changes associated with Alzheimer's disease (AD) pathology holds significant diagnostic and clinical value. AD pathology commonly co-occurs with neurodegenerative and cerebrovascular disease pathologies. In this study, we leveraged comprehensive cognitive data and AD blood-based biomarkers from a cohort of participants clinically diagnosed with mild cognitive impairment (MCI)/AD dementia, Parkinson's disease (PD), or cerebrovascular disease (CVD). Our primary objective was to identify a concise battery of cognitive tests that predict AD pathology, as measured by pTau181. A secondary aim was to examine whether cognitive test scores predicted pTau181 beyond structural neuroimaging markers.

Methods: The sample included 274 older adults (mean age=68.73±7.28 years) clinically diagnosed with MCI/AD (n=94), PD (n=123), or CVD (n =57). Participants were enrolled in the Ontario Neurodegenerative Disease Research Initiative and completed a comprehensive battery of neuropsychological tests and a brain MRI. We included participants with complete data from 12 neuropsychological tests measuring attention, processing speed, executive function, language, visuospatial functioning, and episodic memory. We analyzed overall scores from each test and process scores including errors, repetitions, learning slopes, and trial-by-trial scores. Structural neuroimaging variables included FreeSurfer cortical and subcortical regions. AD pathology was quantified with SIMOA pTau181. We applied least absolute shrinkage and selection operator (LASSO) regression analysis to determine the minimum set of non-redundant markers that predicted pTau181. Primary analyses examined age- and education-corrected neuropsychological test scores and in secondary analyses we added cortical and subcortical regions as additional LASSO predictors.

Results: In the primary LASSO model, 10-fold cross validation repeated 10 times resulted in a median λ of 0.393 (RMSE = 3.935; R2 = .089). Greater pTau181 was associated with fewer errors on Trail Making Test A (coefficient: -0.252), worse performance on Color-Word Interference inhibition/switching (coefficient: -0.101), lower scores on Rey Auditory Verbal Learning Test long-delay recall (coefficient: -0.076) and short-delay recall (coefficient: -0.072), worse performance on Symbol Digit Modalities Test (SDMT; coefficient: -0.036), lower percent retained on Brief Visuospatial Memory Test-Revised (coefficient: -0.016), and more repetitions on Letter Fluency (coefficient: 0.013). When neuroimaging variables were added to the model, 10-fold cross validation repeated 10 times resulted in a median λ of 0.375 (RMSE = 3.898; R2 = .105). In this analysis, the same set of cognitive tests predicted pTau181, except for SDMT. The only brain region significantly associated with pTau181 was cortical thinning in the inferior parietal cortex (coefficient: -2.923).

Conclusion: Among a large set of neuropsychological tests, we identified a subset of test scores that optimally predicted pTau181. Notably, process-approach scores, including errors and repetitions, accounted for unique variance beyond that of traditional test scores. Cortical thinning in inferior parietal regions contributed further unique variance to the prediction of pTau181. These findings suggest that a concise cognitive test battery, requiring approximately 35 minutes to administer, holds promise for assessing cognitive changes associated with AD pathology. An MRI showing atrophy in inferior parietal regions can provide additional evidence of AD pathology.

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mHealth Apps for Dementia and Alzheimer's: An Environmental Scan

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Background/Objectives: Six modifiable lifestyle behaviours (exercise, sleep, diet, stress, mental stimulation, and social interaction) have been shown to play a significant role in reducing dementia risk. There is growing recognition of the potential of mHealth apps focusing on brain-health to address these modifiable behaviours, through setting goals, tracking, and accessing support via social networks. However, it is essential to understand credibility, privacy and transparency factors when leveraging apps as a tool for dementia-prevention. Our objective was to describe the state of available apps intended for the public relating to dementia-prevention and risk factors, highlighting gaps to be addressed in future applications.

Methods: A systematic search following PRISMA guidelines was conducted from Oct 19 - Nov 2, 2022. A total of 1044 dementia-related mHealth apps were retrieved across a comprehensive array of sources, from mobile app stores including iOS store, Google Store, Samsung Store, and Microsoft Store, peer-reviewed literature (including meta analyses and scoping reviews on dementia-prevention), and dementia/Alzheimer's/advocacy websites such as Alzheimer's Society of Canada. After screening and removal of duplicates, 152 apps met the inclusion criteria, which included availability of the app in English and having an indication of purpose/audience related to dementia/Alzheimer's. These apps were coded by two independent reviewers using an extraction framework. The extraction framework included elements such as evidence basis and expert credibility, app features, lifestyle element(s) of focus, privacy/security, and an adapted Silberg evaluation scale.

Results: Of 152 included apps, 57.9% addressed one of the six modifiable lifestyle behaviours associated with reducing dementia risk. However, only 13% addressed multiple behaviours together, which has been suggested to be essential for reducing risk. Intended app users were reported to be people with dementia (69.1%) in most cases. Fifty-five percent of apps scored 2 out of 9 on the Silberg scale, with a mean score of 2.4, suggesting poor credibility and accountability to users. Most apps did not report expert credibility or use of evidence, author credentials (96.1%), information sources (88.2%), evidence-based information (82.2%), or consultation with experts (79.0%). Seventy-five percent of apps were produced by miscellaneous creators who did not have explicit affiliations. Finally, 69.2%, did not disclose adherence to data privacy/security practices.

Conclusion: There is potential for mHealth apps to support individuals in adopting lifestyle changes to prevent dementia. However, there is a need for apps to target multiple behaviours, as research suggests this for optimal impact. There is a lack of publicly-available information about credibility and evidence-base of apps when promoting it for people with dementia or their caregivers, which should be required information. Similarly, apps should follow guidelines to ensure user data privacy/security standards are met. While there is a market for dementia prevention-focused apps, addressing these reported gaps will be necessary for them to be effective and advance successfully.

The Validation of the Plasma p-tau181 immunoassay for use in Clinical Trial Testing

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Background/Objectives: Since the US National Institute on Aging (NIA) and the Alzheimer's Association (AA) proposed a new ATN diagnostic framework that includes amyloid β, pathologic tau, and neurodegeneration for research purposes, it has provided opportunities for moving toward a clinical and biological definition of AD. The detection feasibility of tau phosphorylated at threonine-181(p-tau181) in blood by novel technologies makes it a valuable biomarker for clinical trials and AD diagnostic testing. This report describes the analytical and clinical performance of the plasma p-tau181 assay for establishing a cutoff in clinical trials and diagnosis of AD through two consecutive clinical validation studies.

Methods: These data were obtained after analysis of EDTA plasma for cases with clinical AD and confirmed amyloid PET results. We measured plasma p-tau 181 concentrations of 346 patients examined at the UBC Hospital Alzheimer Clinic between 2008 - 2018. They had been referred to with cognitive impairment complaints and assessed for dementia. They were classified into four diagnostic groups: Non-Cognitive Impairment (NCI), non-AD neurodegenerative diseases, possible AD, and probable AD, according to US National Institute on Aging (NIA) and the Alzheimer's Association (AA) diagnostic criteria. Furthermore, we measured plasma p-tau 181 concentrations of 156 samples of cases with confirmed amyloid PET results. The concentrations of plasma p-tau181 were measured by SIMOA on the Quanterix HD-X analyzer platform. The area under the curve (AUC), Youden index, specificity, and sensitivity, were evaluated among particular clinical groups, control samples, and positive and negative confirmed PET results at various thresholds to define a clinical

Results: The average of plasma p-tau181 was 74.7 ± 47.6 ng/L in probable AD, 61.3 ± 40.62 ng/L in possible AD, 22 ± 24.4 ng/L in non-cognitive impairment (NCI) cases, and 27 ± 17.7 ng/L in healthy controls (HC). ROC analysis with consideration of HC vs. probable AD demonstrated an AUC of 0.9 with 91.8% specificity and 83.9% sensitivity; comparing NCI group vs. probable AD, the AUC was 0.91 with 89.4% specificity and 83.2% sensitivity (based on a 46 ng/L Youden cutoff). Further, the specificity, sensitivity, true-positive, and false-positive for control samples (N = 115) were calculated based on 30, 40, and 50 ng/L thresholds. While the specificity of plasma p-tau 181 was higher at the 50ng/L cutoff (93.9% and 156 true positive vs. 7 cases false positive), its sensitivity was higher at the 30 ng/L threshold (89.1% with 180 true-positive vs. 36 false-positive). EDTA-plasma pTau181 ng/L for amyloid PET-negative controls

Conclusion: The plasma p-tau181 concentrations in AD cases were significantly higher than NCI and controls. The specific analytic findings of plasma p-tau181 quantification showed good promise with a probable clinical cut-off of 46 ng/L for the clinical assessment of AD patients and as a pre-screen tool for clinical trial enrollment.

A Report on Quality Control Study of p-tau 217 in Comparison with p-tau181

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Background/Objectives: The new biomarkers based diagnostic platform of Alzheimer's disease (AD) has provided a movement toward the biological definition of AD. While measurement of amyloid β 42 /40, ptau in Cerebrospinal fluid (CSF), and amyloid β and tau PET can precisely distinguish AD from other neurodegenerative disorders, the detection feasibility of several tau phosphorylated at different threonine sites such as 181(pTau181) and 217(pTau217) in blood by novel technologies also makes them valuable biomarkers for AD diagnosis. These blood biomarkers can accurately predict the course of cognitive decline in the AD continuum.

Methods: The performance of plasma pTau 181 vs. plasma pTau 217 was studied on EDTA plasma samples of normal control (n=2), mid-control (n=1), and high control (n=3) from our pooled samples. In addition, we evaluated the performance of plasma pTau 181 versus plasma pTau 217 using EDTA plasma samples from PET-negative cases (n=35) and PET-positive cases (n=122). The concentrations of plasma p-tau181 were measured by SIMOA on the Quanterix HD-X platform. The levels of plasma pTau217 were measured using a novel commercial plasma-based Simoa assay which has been developed by ALZpath and utilizes an exclusive proprietary monoclonal pTau217 capture antibody.

Results: While the plasma concentrations of pTau 181 (ng/ L) for normal control samples with estimated values of 20 and 30 were 16.25 and 24.42 and for mid-control with an estimated level of 40 was 37.26 and for high control with an estimated amount of 65, 90 and 120 were 52.93, 64.84 and 143.25, the plasma levels of pTau 217 (ng/L) were significantly lower than estimated value (R-squared value = 0.96) include 0.313 and 0.531 for normal control, 0.908 for mid control and 1.001, 1.387 and 2.229 for high control samples. Furthermore, by comparing the ROC curves of plasma pTau 217 and plasma pTau 181, it was observed that the respective Area Under the Curve (AUC) values for pTau 217 and pTau 181 were 0.92 and 0.81.

Conclusion: Plasma pTau 217 concentrations had a more acceptable value than plasma pTau 181 levels in this quality control evaluation which means it has superiority to plasma p-tau 181 for the assessment of plasma pTau to rule out other neurodegenerative diseases and diagnosis of AD.

An Education Intervention to Improve Attitudes Towards Dementia and Sense of Competency in Dementia Care Among Nurses in Acute Care Settings: A Mixed-Methods Study

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Background/Objectives: In Canada, older adults living with dementia comprise up to 30% of the total inpatient acute care population. Caring for this population in an acute care setting can present nurses with a myriad of challenges as they provide acute care for existing co-morbidities, encounter dementia-specific behaviours and strive for person-centered care. The pandemic and current nursing workforce crisis have heightened these challenges. Nurses in acute care are often underequipped to provide person-centered dementia care as they receive very limited education and training on dementia care. Dementia education may improve nurses' attitudes and competency providing care for this patient population.

Methods: A pre-posttest design, mixed-method approach was used to pilot a dementia care education intervention among nurses in acute care in a large community hospital in Toronto, Canada. Developed by clinicians with expertise in dementia care and nursing education, the education intervention aimed to improve nurses' attitudes and sense of competency providing dementia care. The education intervention included two components: a full-day workshop, which covered an overview of dementia, person-centred care, and practical strategies for enhancing caring relationships with persons living with dementia in the context of COVID-19. Following the workshop, participants were invited to five weekly virtual check-ins with take-home reflective learning activities. To evaluate the education intervention, participants completed two sound psychometric surveys pre- and post-intervention. Field notes were taken throughout the workshop. Participants were also invited to individual interviews to describe their experiences with the intervention and their perception of its impact on their practice and patient care.

Results: Over 40 nurses are enrolled in the intervention, with 15 who completed the intervention and study measures. The remaining participants will complete the intervention in August 2023. Majority of the participants reported having little to no previous dementia care education and training. Preliminary results indicated that post-intervention, participants' (n=15) scores on their attitudes towards persons living with dementia significantly increased ($p<0.001$) compared to baseline and the effect size was large (Cohen's d = 2.23). Participants' scores on their sense of competency in dementia care also significantly increased ($p<0.001$), with a large effect size (Cohen's d = 1.73). In the interviews, participants reported the need for such an intervention, plans to use the specific tools and strategies provided during the workshop, as well as greater confidence in providing person-centered dementia care in their future clinical practice.

Conclusion: Providing person-centered care to persons living with dementia in acute care is challenging and confounded by numerous barriers, particularly the negative attitudes developed by nurses due to insufficient competence in providing person-centered dementia care. A lack of adequate dementia care education and training has been well-established in the literature as a major factor affecting the quality of care provided in hospitals. Education interventions that focus on improving nurses' attitudes and a sense of competency in person-centred dementia care can support nurses to uphold the personhood of persons living with dementia. Given current population trends, such interventions are timelier than ever.

The Impact of Coaching and Mentoring Person Centered Care with Care Partners' in a Changing Long Term Care Environment

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Background/Objectives: The North Simcoe Muskoka Specialized Geriatric Services Geriatric Mental Health LTC team, provides support to older adults with responsive behaviours and their care partners. The Community Support Worker

(CSW) role provides invaluable support, as coach and mentor, to recognize the importance of person-centred care. Coaching and mentoring alleviates care partner stress and enhances the quality of life for older adults. This presentation will detail the role and skills of the CSW and the significance of building a therapeutic relationship with care partners, as an external provider, to coach and mentor person-centred care in LTC.

Methods: With a focus on non-pharmacological interventions, CSWs collaborate with the care team to implement person-centred strategies to support the person within their reality. To achieve this, CSWs engage in hands on assistance with care partners to observe interactions and to gather a firsthand understanding of the person. They collect important psychosocial history to inform supportive coaching as to the potential contributor(s) to a person's presentation. CSWs build relationships with the care team in daily interactions to model attitudes, care approaches and interventions; recognizing when to lead or to step back and guide as an external coach and mentor. They analyze risks with associated losses and identify when education for the care team may be of benefit.

Results: Ongoing peer to peer communication with care partners is imperative when building trust and creating solidarity to understand and navigate through care partners' challenges. Recognizing when to lead by coaching and modeling versus questioning barriers is a coaching skill that CSW's have had to acquire. Building a therapeutic rapport with care partners has supported CSWs to make suggestions and initiate conversations that drive different ways of thinking when advocating and promoting person- centred care. To date, feedback on the success and value of the CSW role has been largely informal and anecdotal.

Conclusion: CSWs support care partners to implement person centred, non-pharmacological strategies and interventions that are beneficial to persons living with cognitive impairment in LTC. CSWs are a trusted collaborator of care partners to achieve a better quality of life for all through coaching, mentoring and modeling of leading practices in Dementia care.

Influence of Linguistic Background on Cognitive Performance in Healthy Aging Adults: Baseline Data from the Canadian Multi-Ethnic Research on Aging (CAMERA) Study

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Background/Objectives: As Canada's population ages and becomes increasingly diverse, there is a need to include ethnically diverse groups in dementia research. A major barrier is that most cognitive tests have been developed in English-speaking White samples. Therefore, cognitive tests may not be valid in individuals from different linguistic and cultural backgrounds. A potential solution to this issue is to use eye tracking tasks which robustly measure cognition while minimizing language and cultural influences. The objective of this study was to examine the influence of linguistic background on standard neuropsychological tests and eye tracking tasks in a cohort of healthy aging adults.

Methods: Participants were 49 adults (age range=55-83; mean age=69.10; 67% female) from the Canadian Multi-Ethnic Research on Aging (CAMERA) study. Participants had sufficient English proficiency for study procedures. 17 participants learned English as a first language (EFL) and 32 learned English as a secondary language (ESL). Participants completed a comprehensive battery of standard neuropsychological tests and a video-based eye tracking task called the interleaved pro/anti-saccade task (IPAST). The IPAST is a well-characterized eye tracking task sensitive to changes in executive function associated with aging and cognitive impairment. Standardized performance metrics from both the neuropsychological and IPAST assessments were adjusted for age, sex, and years of education before being entered into separate exploratory factor analyses to identify latent variables underlying performance. Spearman's correlations were used to assess associations between the neuropsychological and IPAST factor scores, and Mann-Whitney U tests were used to compare factor scores between the EFL and ESL groups.

Results: Exploratory factor analysis identified three factors for the battery of standard neuropsychological tests: executive function/processing speed, visual memory, and language; and three factors for the IPAST: attention, inhibitory processes, and executive function. The executive function factors derived from the two assessment types (i.e., standard neuropsychological tests and the IPAST) exhibited a strong association, both across groups (r=-0.44, p=0.002), and within groups (EFL: r=-0.39, ESL: r=-0.42). No other factors correlated with one another (p>0.05). Comparisons of the neuropsychological and IPAST factor scores between the EFL and ESL groups indicated that language factor scores, derived from the neuropsychological tests, were significantly lower in the ESL group relative to the EFL group (U=153, p=0.024). None of the other factors differed between groups (p>0.05). Interestingly, language factor scores were significantly associated with participants' self-reported proficiency in speaking (r=-0.369, p=0.032), understanding (r=-0.519, p=0.002), and reading (r=-0.421, p=0.013) English.

Conclusion: Establishing tools that accurately assess cognition across diverse groups is essential to advance our understanding of cognitive impairment and dementia in understudied populations. Here we demonstrated the potential of eye tracking tasks, such as the IPAST, to provide a brief and language-free measure of executive function that aligns well with standard neuropsychological tests. Future research with a larger sample will investigate the possibility of using the IPAST and other eye tracking tasks to assess additional cognitive domains in a language-neutral manner. With further validation, eye tracking tasks may provide a valid way to screen for cognitive impairment in all Canadians.

Pre-liminary Study: Arabic Translation and Validation of the Mild Behavioral Impairment Checklist

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Background/Objectives: Mild Cognitive Impairment (MCI) is an intermediate stage between normal aging and dementia, with a higher risk of progressing to dementia. Recently, it has been suggested that behavioral changes may precede or accompany the cognitive decline associated with MCI, leading to development of Mild Behavioral Impairment (MBI) concept. The MBI Checklist (MBI-C) was developed as a screening tool to help identify early signs of behavioral and psychological symptoms in individuals at risk of developing dementia. Our aim in this study was to develop a translated and validated Arabic version of the MBI-C.

Methods: The English MBI-C form was translated and back translated into Arabic with cultural adaptation by 2 independent authors who are fluent in Arabic and English. A pilot study was done in the Family medicine and polyclinics of KFSH&RC in Riyadh, Saudi Arabia to assess the Arabic version's clarity and acceptability, followed by a larger sample of Arabic-speaking individuals to evaluate the questionnaire's validity. Patients 60 years and older were included in this study. The presence of any medical or psychiatric conditions that may have an impact on either subjective or objective assessment of cognitive functioning was considered as an exclusion criterion. Internal consistency was measured using Cronbach's Alpha. Test-retest reliability was evaluated by administering MBI-C twice to the same group of participants and calculating the correlation coefficient.

Results: Fifty-nine Saudi patients were included. Mean age was 67.3 years old. Of the included patients, 30 were females and 29 were males. All questionnaires were collected in a clinic. Using the Arabic MBI-C, 27 (46%) participants were evaluated by a physician, 19 (33.3%) by participants themselves, and 12 (20.5%) by informants. The internal consistency of the questionnaire items was assessed using Cronbach's alpha, resulting in a coefficient of (0.84). Test-retest reliability correlation coefficient was 0.82.

Conclusion: The Arabic translated MBI-C demonstrated acceptable internal consistency and test-retest reliability. This validated version paves the way for further research and advancements in elderly care across Arabic-speaking countries.

Detecting Amyloid Beta from Cognitive Performance: A Comparison of Computerized and Conventional Tests Using Single and Repeated Assessment

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Background/Objectives: Accelerated identification of Alzheimer's disease pathology is imperative for early diagnosis and initiation of preventative interventions. Longitudinal cognitive monitoring improves detection of dementia compared to cross-sectional screening, however repeated testing with conventional paper-and-pencil tools is costly and inaccessible. Computerized cognitive assessments are well-suited for repeated testing due to their measurement precision and remote unsupervised administration capabilities. Additionally, computerized tests are sensitive to identify a unique cognitive marker of pathological amyloid beta (Aβ) accumulation: diminished practice effects. This research evaluated whether a computerized test can better associate with Aβ compared to conventional cognitive instruments, when assessed using single and repeated administrations.

Methods: Data were collected from the Alzheimer's Disease Neuroimaging Initiative 3 cohort study. Participants were cognitively normal at baseline. Conventional neuropsychological testing and PET imaging occurred at baseline and then biennially over four years. Computerized testing was conducted in clinic and remotely. The computerized measure was a visual learning and recognition task, the One Card Learning (OCL) test. The criterion conventional tools were the Montreal Cognitive Assessment (MoCA) and Rey Auditory Verbal Learning Test (RAVLT) which measure global cognition and delayed verbal recall, respectively. In study 1, associations between baseline cognition and Aβ+ status, quantified as ≥2 SD whole cerebellum referenced region standardized uptake value ratios (SUVR), were determined using unadjusted area under the curve (AUC) analyses maximized with Youden's index. In study 2, associations between repeated cognitive scores and Aβ+ accumulation, calculated via linear regression-based longitudinal threshold using a cortical composite SUVR, were determined with generalized linear mixed models (GLMM).

Results: In study 1, there were 598 participants (mean age= 73.7 years, 52.5% female, 16.6 years of education, 92% White, 35.1% ApoE ε4+). RAVLT scores provided the strongest prediction of Aβ status (AUC= .60, p< .001, 95% CI [.55, .64]) compared to the MoCA (AUC= .59, p< .001, 95% CI [.54, .64]) and OCL (AUC= .56, p= .020, 95% CI [.51, .60]). The MoCA had the highest sensitivity (78.8%) while the OCL had the best specificity (53.8%). In study 2, there were 331 participants (mean age= 73.1 years, 54.4% female, 16.6 years of education, 93.7% White, 39.3% ApoE ε4+). The MoCA GLMM provided the best model fit. The main effects of OCL (B= -1.18, p= .032, OR= .31), MoCA (B= -.08, p= .038, OR= .92), and RAVLT (B= -.10, p< .001, OR= .90) significantly predicted Aβ accumulation. Only the OCL detected attenuated practice effects that distinguished Aβ+ from Aβ- accumulation groups.

Conclusion: Using a single assessment, a computerized cognitive test provided similar but low predictive power to identify Aβ status compared to two conventional neuropsychological tools. The OCL demonstrated the lowest sensitivity, indicating that it is inadequate for clinical Aβ status screening when used alone. With repeated administrations, the MoCA provided the best estimate of Aβ accumulation over four years. However, only the computerized instrument detected diminished practice effects in Aβ+ individuals, indicating that the OCL is a sensitive tool for measuring subtle cognitive changes in longitudinal testing. Further research should explore whether computerized tests provide a viable preclinical AD monitoring alternative.

Prevalence of Cannabis Use and Associated Characteristics in Patients Attending a Canadian Cognitive Clinic

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Background/Objectives: To investigate the prevalence and characteristics of cannabis use in patients attending a specialty cognitive assessment clinic. With a rising proportion of cannabis users in the Canadian population since its legalization in 2018, understanding the prevalence and characteristics of cannabis use can help clinicians provide advice and make informed decisions about the use of cannabis when managing patients with cognitive disorders.

Methods: We analyzed demographic and neuropsychological data for 238 patients who attended the Cognitive Neurosciences Clinic at the University of Calgary from February 11, 2019 to May 3, 2023 and who consented to participate in the PROMPT registry. A clinic physician or nurse captured information on cannabis use using a standardized case report form. Cannabis use was categorized as recreational, medicinal (to treat medical symptoms, as defined by the patient), or both. Dose information was not captured. Among 438 consecutive consenting patients, 199 were excluded for missing cannabis information and one for missing sex. Characteristics were compared between current cannabis users and non-users using the two-sample t-test or chi squared test as appropriate. Due to relatively low numbers, recreational and medicinal users were combined for analysis.

Results: Among all patients with recorded cannabis information, 23 out of 238 (9.7%) reported using cannabis. Amongst those that report cannabis use, more used for recreational purposes (n=12) than medicinal (n=8), and a few reported using for both (n=3). Those who reported cannabis use were younger (mean age 68.87 [SD=9.49] vs. 62.00 [SD=7.51]; p<0.001), more likely to have reported a diagnosis of a mood disorder (62.5% vs 26%, p=0.005), more likely to be former or current cigarette smokers (73.7% vs 42.9%, p=0.019) and more likely to report daily alcohol use (38.1% vs 15.6%, p=0.02). The association with mood disorders was stronger in those that reported recreational use (62.5% vs 26.0%, p=0.005) than those that reported medicinal use (42.9% vs 26.0%, p=0.58). Compared with those that did not report cannabis use, there were no statistically significant differences in sex, race, education, insomnia, obstructive sleep apnea, anxiety disorders, and psychotic disorders.

Conclusion: Approximately one in 10 patients attending a cognitive assessment clinic reported cannabis use, of whom two-thirds reported recreational use. For context, the Canadian Institute for Health Information found that 8% of Canadians 65 years and older used cannabis product(s) in the last 12 months in 2020. The association between cannabis use and higher prevalence of mood disorders could indicate that mood symptoms are prompting cannabis use or that cannabis use is adversely affecting mood. Further research would be helpful to better understand this association and patient’s motivations for use.

Promising Practices for Developing an Accessible Dementia Information Resource Website for Diverse Knowledge Users

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Background/Objectives: The abundance of mental health information available online can be simultaneously enticing and overwhelming. Despite individual, social, and technical barriers, the internet remains the first place most older adults turn to for health information. To understand and compassionately respond to behaviours in dementia, diverse knowledge users require timely access to relevant and trustworthy information. To address this need, the Canadian Coalition for Seniors’ Mental Health (CCSMH) is developing the Behaviours in Dementia Toolkit, a new website that curates knowledge user-friendly information and resources about behaviours in dementia in conjunction with its new clinical guidelines.

Methods: Join us for a demonstration of how we are engaging with diverse knowledge users to bring this online resource library to life and make it relevant to their lives. We will discuss how we are grappling with online accessibility, terminology selection, resource curation, and information infrastructure. We are drawing on the expertise of librarians to make this a user-friendly, dynamic, and functional collection that addresses the scope of behaviours in dementia from many different perspectives. Our goal is to save busy care partners and health care providers’ time and frustration by curating and presenting valuable resources in an intuitive manner. Through our iterative design process, we have tracked successes, challenges, and lessons learned. To reach equity-deserving audiences more effectively, established practices for equity, diversity, and inclusion have been integrated throughout the development of this online resource library, including accounting for disability, cultural and linguistic diversity, and de-stigmatizing language.

Results: We will launch the Behaviours in Dementia Toolkit in early 2024 and activate our robust outreach and evaluation plan. By consistently engaging with the scientific evidence from knowledge mobilization, information studies, and mental health promotion; collaborating with our multidisciplinary team; and consulting with care partners, people with living experience of dementia, and health care providers, we have navigated contested perspectives on addressing behaviours in dementia to produce a practical and evidence-based library of resources. We anticipate the Behaviours in Dementia Toolkit will be welcoming and useful to knowledge users with different interests, needs, and kinds of expertise. We will measure key metrics to determine the extent to which this online resource library addresses their priorities and needs. We will share promising practices and principles arising from the development of the Behaviours in Dementia Toolkit relevant to the creation and management of other health information websites and digital knowledge mobilization projects.

Conclusion: We will share insights into the development of online health information resources through a case study of the Behaviours in Dementia Toolkit. Behaviours in dementia are a distinct, significant, and complex aspect of dementia that requires understanding and support across multiple settings, roles, and contexts. By leveraging the perspectives of people living with dementia, care partners, and multi-disciplinary health care providers, we have been able to curate and present valuable resources in a practical, accessible toolkit. We are excited to share this unique website with you!

The Association Between Adverse Childhood Experiences, Mild Behavioral Impairment, and Everyday Cognition in Older Adults

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Background/Objectives: Positive childhood experiences are critical for proper brain development. Conversely, studies have found that adverse childhood experiences (ACEs) are associated with functional and morphometric alterations in critical stress and emotion-associated brain regions and increased cognitive decline in older adults. Later-life emergent and persistent neuropsychiatric symptoms described in the mild behavioral impairment (MBI) framework and later-life emergent cognitive impairment (e.g., mild cognitive impairment) are associated with a greater risk for dementia. Here, we aimed to determine whether dementia-free older adults with more severe ACEs have more behavioral symptoms and more cognitive symptoms, which could indicate a greater susceptibility to incident dementia.

Methods: Data were obtained from the Canadian Platform for Research Online to Investigate Health, Quality of Life, Cognition, Behaviour, Function, and Caregiving in Aging (CAN-PROTECT) study. ACEs were measured by the childhood trauma screener 5-question questionnaire (CTS-5), behavioral symptoms were measured with the self-reported MBI Checklist (MBI-C), and cognitive symptoms were measured with the self-reported revised Everyday Cognition (ECog-II) scale. For each scale, a greater score indicates more severe symptoms. Zero-inflated negative binomial models were used to determine the association between ACE (predictor) and MBI (outcome), and standard negative binomial models were used to determine the association between ACE (predictor) and ECog (outcome). All models were adjusted for age, sex, highest level of education, ethnic origin, and clinical diagnosis of depression and anxiety. A mediation analysis based on the diagnosis of depression or anxiety was conducted based on 1000 simulations using bootstrapping.

Results: For the analysis examining the association between ACE and MBI (n=788), study participants were 64.56 (±7.19) years old on average, 80.20% were female, 25.12% had a bachelor's degree or certificate equivalent to a bachelor's degree, and 61.05% (n=663) had European origins. For the analysis examining the association between ACE and ECog (n=842), study participants were 63.33 (±8.42) years old on average, 79.81% were female, 26.25% had a bachelor's degree, and 61.24% (n=711) had European origins. Adjusting for all covariates, every 1-point increase in the CTS-5 total score was associated with a 7.29% (95%CI:3.73-10.98; $p<0.001$) increase in MBI-C score and a 2.76% (95%CI: 0.32-5.34; $p<0.05$) increase in ECog score. For mediation analyses, neither the association between ACE and MBI (b=0.14; 95%CI:-0.06-0.39, p=0.160) nor the association between ACE and ECog (b=0.01; 95%CI:-0.00-0.01, p=0.142) were mediated by a diagnosis of anxiety and depression.

Conclusion: This study illustrates that older adults with more severe ACEs have more severe neuropsychiatric symptoms and poorer cognition. Additionally, this association is not mediated by previous psychiatric history, indicating that ACEs may directly contribute to more behavioral symptoms and worse cognitive symptoms. These later-life behavioral and cognitive symptoms are risk factors and potentially disease markers for incident dementia. Thus, clinicians could assess for ACEs in clinical screening of older adults to inform risk for incident cognitive decline and dementia. Further, prevention of ACEs may have implications for brain health in later life and the impact on cognitive reserve.

Mild Behavioral Anosognosia: The Impact of Cognition on the Discrepancy Between Self- and Study Partner-Reported Mild Behavioral Impairment

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Background/Objectives: Mild behavioral impairment (MBI) leverages later-life emergent and persistent neuropsychiatric symptoms to identify a high-risk group for incident cognitive decline and dementia. MBI is measured using the Mild Behavioral Impairment Checklist (MBI-C), which is completed by the participant or study partner (SP). However, the MBI-C may perform differently in these groups, with different degrees of symptom endorsement. Anosognosia – loss of insight into one's own symptoms or deficits – may contribute to this discrepancy, where those with worse cognition underreport symptoms. We aimed to investigate whether poorer cognition was associated with a greater discrepancy between self- and SP-reported MBI scores.

Methods: Data were obtained from the Canadian Platform for Research Online to Investigate Health, Quality of Life, Cognition, Behaviour, Function, and Caregiving in Aging (CAN-PROTECT) study. In participant-SP dyads, MBI was measured with the self- and SP-reported MBI-C, and cognition was measured with the SP-reported revised Everyday Cognition (ECog-II) scale. Greater scores on the MBI-C and ECog scales indicate more severe behavioral symptoms and worse cognition, respectively. The absolute discrepancy in self and SP-reported MBI was defined as the absolute difference between self- and SP-reported MBI total scores. Negative binomial regression was used to model the association between SP-reported ECog (predictor) and the absolute difference in self- and SP-reported MBI score (outcome). Logistic regression was used to model the likelihood of SPs reporting greater MBI than participants as a function of ECog. All models were adjusted for participant and SP age, sex, and highest level of education.

Results: The total sample comprised 392 participant-SP dyads. Participants were 64.9 (±6.9) years old on average, 72.4% were female, and 50% had a bachelor's degree or a degree/certificate above a bachelor's degree. SPs were 59.9 (±13.4) years old on average, 50.2% were female, and 26.3% had a bachelor's degree or a degree/certificate above a bachelor's degree. After accounting for covariates, every 1-point increase in SP-reported total ECog score was associated with a 2.5% (95%CI: 1.5-3.6, p<0.001) increase in the absolute difference between self- and SP-reported MBI score. Additionally, as SP-reported ECog increased, the odds of SP-reported MBI-C score being two or more points greater than self-reported MBI-C score increased by 6.92% (95%CI:4.4-9.9, p<0.001).

Conclusion: This study illustrates that in the absence of cognitive impairment, self-, and SP-reported MBI tend to be consistent. However, as cognition worsens, participants have poorer insight into their behavioral symptoms, increasing the importance of the study partner. These findings suggest that anosognosia can extend to non-cognitive domains like behavior and that participant-study partner dyads are required to obtain a more reliable and robust assessment of behavior. Biomarker and imaging studies are required to determine neural correlates and mechanisms of behavioral anosognosia. Longitudinal studies are required to determine the impact of behavioral anosognosia on cognitive trajectories and dementia incidence.

The Association Between Study-Partner- and Participant-Reported Mild Behavioral Impairment with Executive Function, Memory, and Language

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Background/Objectives: Mild behavioral impairment (MBI) leverages later-life emergent and persistent neuropsychiatric symptoms to identify a high-risk group for incident cognitive decline and dementia. The Mild Behavioral Impairment Checklist (MBI-C), administered to either study partners (SP) or participants, can be used to assess MBI. However, the efficacy of the MBI-C for predicting cognitive decline and dementia across different types of reports is not yet fully understood, especially when SP and participant reports conflict. We aimed to investigate the relationship between discordant SP- and participant-reported MBI, and executive function, memory, and language.

Methods: Data were obtained from the Canadian Platform for Research Online to Investigate Health, Quality of Life, Cognition, Behaviour, Function, and Caregiving in Aging (CAN-PROTECT) study. MBI was measured using the SP- and participant-reported MBI-C. MBI was categorized as MBI+ based on a validated MBI-C score cut-point of ≥8. A four-level exposure variable was created based on concordance (SP+/P+, SP-/P-) and discordance (SP+/P-, SP-/P+) on MBI status (with SP-/P- as the reference group). Executive function was measured using Trail Making A/B, Stroop task, and Self-Ordered Search. Memory was measured by Paired Associate Learning and Digit Span tests. Language was assessed with a Verbal Reasoning task. Multivariable linear regressions modeled the association between dyadic MBI status (exposure) and standardized neuropsychological test scores (outcome), adjusted for SP and participant age, sex, and highest level of education.

Results: The sample comprised 442 SP-participant dyads. Mean age was 59.5±13.7 years for SPs and 64.6±7.0 years for participants. Both groups were 73.3% female, and approximately a quarter had a bachelor's degree or above. SP+/P+ MBI was associated with significantly poorer Trail Making (b=0.63, 95%CI: 0.28—0.97), Stroop (b=-0.36, 95%CI: -0.72—-0.00), and Verbal Reasoning (b=-0.38, 95%CI: -0.74—-0.02) performance relative to SP-/P- MBI. These associations remained even when only study partners reported MBI: SP+/P- MBI was associated with poorer Trail Making (b=0.35,95%CI:0.03—0.67), Stroop (b=-0.46,95%CI:-0.79—-0.12), and Verbal Reasoning (b=-0.43 95%CI:-0.77—-0.09). Furthermore, SP+/P- MBI was associated with poorer Self-Ordered Search performance (b=-0.43, 95%CI:-0.77—-0.08); a finding not observed for SP+/P+ MBI. When only participants reported MBI (SP-/P+), MBI status was associated with poorer Paired Associates Learning (b=-0.29, 95%CI:-0.56—-0.03) and Verbal Reasoning (b=0.35, 95%CI:0.09—0.61). No dyadic combinations of MBI status were associated with Digit Span performance.

Conclusion: SP-reported MBI better predicted executive function and language scores, while participant-reported MBI better predicted memory in this sample of community-dwelling older adults. The findings for executive function and language, as reported by SP, may be due to participant loss of insight or anosognosia. However, participant-reported MBI may better predict memory scores because the SP may not observe subtle memory changes, likely more easily perceived at this stage by the participant. Ultimately, these findings indicate that both SP and participant are important when assessing neuropsychiatric symptoms. Longitudinal data are required to determine the cognitive trajectories in these groups.

Expanding the Notion of Cognitive Reserve: Cognitive Reserve is Linked to Better Cognition and Behavior in Older Adults

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Background/Objectives: Persons with higher cognitive reserve show fewer cognitive deficits than those with lower cognitive reserve at the same degree of neuropathological burden. However, just as cognitive decline manifests during prodromal stages of age-related neurodegenerative diseases, so may behavioral change. Mild behavioral impairment (MBI) refers to a subset of neuropsychiatric symptoms in older adults selected for later-life symptom emergence and persistence, which are associated with incident cognitive decline and dementia, and a greater probability of prevalent Alzheimer's disease. Given the parallels between cognitive and behavioral change in dementia, we investigated whether higher cognitive reserve was linked to lower behavioral symptom severity.

Methods: Cross-sectional data from 1202 participants from the Canadian Platform for Research Online to Investigate Health, Quality of Life, Cognition, Behaviour, Function, and Caregiving in Aging (CAN-PROTECT) study were used. Cognitive reserve was operationalized via a cognitive reserve composite scale (CRCS) calculated from items in three domains: education (2 items), occupation (5 items), and cognitively stimulating leisure activities (6 items), to generate the CRCS ranging 0-1; higher values indicated greater cognitive reserve. To determine the validity of the CRCS, it was modelled as a predictor of the revised Everyday Cognition (ECog-II) scale total score. To investigate the association between the CRCS (predictor) and MBI symptoms (outcome), two models were used. The first model was a logistic regression with the outcome being MBI+ status defined by an MBI-Checklist score ≥8. The second model was a zero-inflated negative binomial regression. All regression models controlled for age, sex, ethnocultural group, and marital status.

Results: Participants (78.6% female) were 63.0±8.6 years old and had completed 15.6±3.9 years of education, on average. The average CRCS, MBI total, and ECog-II total scores were 0.48±0.11, 2.1±2.2, 8.8±7.9, respectively. Approximately a quarter of participants (26.8%) had MBI. There was an 8.3% (95%CI:3.3-13.0, p=.002) decrease in ECog-II total score for every 1 SD increase in the CRCS. After controlling for MBI total score this association did not remain statistically significant (b=3.7, 95% CI:-1.1-8.2, p=.14). MBI was also associated with cognitive reserve; every 1 SD increase in the composite score was linked to a 15.8% (95%CI:4.3-26.5, p=.01) lower odds of having MBI and a 12.2% decrease in MBI total symptom severity (95%CI:4.5-18.4, p<.001). Like with cognitive function and reserve, associations between cognitive reserve and both MBI status (b=10.1, 95%CI:-4.5-22.7, p=.17) and MBI total symptom severity (b=5.6, 95%CI:-1.2-11.9, p=.11) did not remain statistically significant after accounting for ECog-II total score.

Conclusion: The statistical association between cognitive reserve and behavior is as strong as the association between cognitive reserve and cognition. MBI can occur in advance of or in the absence of cognitive decline, suggesting cognition does not fully explain the association between cognitive reserve and behavior. These findings indicate that cognitive reserve, operationalized through education, occupation, and leisure activities, may extend to non-cognitive outcomes, like behavior. Future work must disentangle possible mediative pathways through which cognitive reserve may affect both cognition and behavior, explore common etiologies for cognitive and behavioral symptoms, and observe outcomes longitudinally to better understand these associations.

Feasibility of a Home-Based Double-Blind Randomised Controlled Trial to Improve Gait and Cognition in Individuals at Risk for Dementia

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Background/Objectives: Physical exercise and cognitive training have the potential to enhance cognitive function and mobility in older adults at risk of Alzheimer's disease and related dementia (ADRD). However, little is known about the feasibility of delivering multi-domain interventions in home settings of older adults at risk of ADRD. This study aimed to assess the feasibility of home-based delivery of exercise and cognitive interventions, and to evaluate the relationship between participants' intervention preferences and their subsequent adherence.

Methods: The SYNERGIC@Home/SYNERGIE~Chez soi feasibility trial is a randomized control trial that followed a 2×2 factorial design, with a 16-week home-based intervention program (3 sessions per week) of physical exercises and cognitive training delivered in English or French depending on participant's choice. Participants were randomized to either: 1) combined exercise (aerobic and resistance) + cognitive training (NEUROPEAK™); 2) combined exercise + control cognitive training (web searching); 3) control exercise (balance and toning) + cognitive training; and 4) control exercise + control cognitive training. The study was fully implemented and executed using Zoom for HealthCare™. Primary feasibility outcome was adherence to the interventions, with target adherence of 75%. Secondary feasibility outcomes included recruitment rate (eligible versus screened) and retention (% who complete interventions and assessments), adverse events (AE) (relation to the trial), self-report trial experience, and blinding success.

Results: Between July 2021- July 2023, 145 older adults were pre-screened for eligibility, 72 provided informed consent and proceeded to full screening, 60 were randomized, 57 started the interventions, and 52 completed the intervention program. Overall adherence was 81.6+/-24.3%, which was higher than the target of 75% (p=.023). For the 52 participants that completed all interventions, adherence was 87.5+/-15.1%, and there was no significant difference in adherence between treatment arms (p=.656). Pre-screen filter rate was 50%. After signing consent, 83% went on to be randomized. Of the 60 participants randomized to a treatment arm, 86.7% completed the 16-week intervention and assessments. AE severity was not related to being in the trial (p=.595). Adherence was significantly related to satisfaction with research coordinator/assistant interactions (p=.015), time commitment (p=.004) and the exercise interventions (p=.007). In exit questionnaires, only 28% of participants guessed their intervention arm correctly, consistent with a random guess.

Conclusion: Home-based videoconference delivery of cognitive and physical exercise interventions and detailed activity and clinical assessments can be successfully implemented as a double-blind randomized controlled trial, for older adults with cognitive impairment or at risk of dementia. Neither adherence nor trial satisfaction were impacted by treatment arm allocation, suggesting that participants enjoyed the interventions and remained blinded throughout the study. Home-based videoconferencing may be considered an efficient and effective way to reach older adults who would otherwise be unable to participate in Brain Health programs, such as those who live in rural and suburban communities.

Operationalizing a Home-Based, Double-Blind, Placebo Controlled Study of Cognitive and Physical Interventions in Older Adults at Risk for Dementia

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Background/Objectives: Synchronizing Exercises, Remedies in Gait and Cognition at Home (SYNERGIC@Home/SYNERGIE~Chez soi) is a home-based, double-blind, randomized controlled trial (NCT04997681) targeting community-dwelling older adults at risk for dementia. This study was originally planned to be an on-site, 16-week intervention clinical trial in New Brunswick for both Anglophone and Francophone participants with a final assessment at month 10 (T10). With COVID-19 the study needed to pivot to a home-based study with interventions and assessments delivered by videoconferencing (Zoom). This required adjustment of most of the operations planning of the trial that took place starting recruitment in July 2021 and completed July 2023.

Methods: The study protocol and operations were adjusted, allowing this study to proceed with web-based videoconferencing. Changes were needed for the consent process, cognitive, clinical and activity assessments, delivery of the physical and cognitive interventions, adverse event reporting and tracking, and data collection and data security. The consenting, assessments at screening and baseline were done via secure web-based videoconferencing with the research team members. All equipment needed, with detailed instructions, were mailed out to participants. One-on-one interventions were also performed via videoconferencing between the participant and the trainer. All adverse events were recorded, reported, and managed remotely by the research team. Assessment data was collected during the visits on paper case report forms and were scanned into the secure data depository. Planned blood work and neuroimaging were removed from the protocol, but saliva samples were able to be self-collected in participants homes. With these adaptations the study has successfully been completed.

Results: The first participant was seen July 2021 and all assessment visits were completed by end of July, 2023 with bilingual delivery of all aspects of the study being maintained throughout. A total of 60 participants were consented and were randomized to intervention, 52 fully completed interventions and 48 fully completed T10 assessments. Recruitment included participants from both urban and rural settings. Only 8 participants withdrew during the intervention phase and only another 4 subsequently withdrew before the T10 final assessments. The adverse events were successfully managed remotely with no significant related serious AEs and few related mild to moderately related AEs. The collection of assessment, intervention and actigraphy data occurred with little to no loss of data and with very few technological problems requiring protocol deviations. Participants reported high satisfaction rates across most aspects of the study.

Conclusion: This study demonstrates that a home-based, double-blind, randomized controlled trial can be conducted successfully with adaptations to the protocol and operational plan. Some adjustments are needed to allow assessments and interventions to be performed remotely and budget is needed for the delivery costs of equipment and assessment instruments. Data quality was not compromised, and participants engaged and were satisfied.

Screening for Memory Concerns in Community-Based Settings to Facilitate Early Detection of Alzheimer's Disease: Can Optometry Clinics Serve as a Useful Venue?

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Background/Objectives: Canada faces a shortage of dementia specialists and yet there is an urgent unmet need to increase screening capacity for Alzheimer's disease, particularly considering the fact that disease-modifying drugs may soon be available in Canada. This study aimed to (1) assess the feasibility of a community-based Alzheimer's screening program to increase rates of cognitive and biomarker assessment, and (2) evaluate the risks, benefits, facilitators, and barriers to adoption and implementation of these settings to increase rates of cognitive and biomarker assessments in settings not previously involved in these activities.

Methods: Design was a single-group, cross-sectional study to assess the utility of leveraging community-based settings to increase cognitive assessment rates and biomarker testing for Alzheimer's disease. Eligible participants were adults aged ≥55 with memory symptoms. A utilization focused evaluation was used to explore risks, benefits, facilitators, and barriers to these settings from the perspectives of frontline providers. Through this program, participants underwent screening via one of two entry points—a local Alzheimer Society chapter for cognitive assessment by a social worker or via an optometry clinic for a RetiSpec's AI-based eye test to detect biologic signatures of Alzheimer's disease. The latter consisted of bilateral images of the retina using a standard fundus camera with hyperspectral attachment plus a brief survey on scan experience. Cognitive assessment results were shared with a primary care provider and a visit to discuss results was facilitated. Key informant interviews were completed with front-line team members.

Results: To date, n=916 individuals were screened (59.2% from optometry; 40.8% from Alzheimer Society) with n=129 participants enrolled. For aim 1, cognitive screening assessments and hyperspectral retinal scans for Alzheimer's screening were integrated well into existing clinical workflows. Endpoint 1, to increase the rate of cognitive assessments performed, was met with 14.4/month vs. 1.8/month in the 12-month pre-study period. Endpoint 2, to have 10% of all referrals for cognitive assessments originate from optometry, was met with 30.8% of individuals coming from optometry clinics. For aim 2, facilitators included: effective training, staff interest, clear communication with primary care, and financial coverage for screening. Barriers included: stigma, program awareness, and lack of electronic health record sharing. Results from the RetiSpec survey showed that participants had a positive eye scan experience (4.4/5), were willing to repeat the scan in future (4.5/5), and were interested in sharing the results with their primary care provider (5/5).

Conclusion: Utilizing community-based settings, including optometry clinics and social workers with an Alzheimer Society chapter, demonstrated a promising approach to Alzheimer's disease screening with effective training and staff interest. In terms of biomarker assessment, technology, such as RetiSpec's eye scan, that can leverage existing imaging infrastructure, may offer a pragmatic, affordable, and scalable way to increase Alzheimer's screening rates via optometry settings.

Bio-Cognitive Networks Across the Alzheimer's Disease Continuum: Integrating Structural Neuroimaging and Cognitive Test Performance in Multi-Modal Network Analysis

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Background/Objectives: The brain-behavior relationship in Alzheimer's disease (AD) is characterized by interactions between numerous biopsychosocial factors that evolve over different stages of cognitive decline. Network psychometric analysis offers a multivariate statistical approach able to integrate neuropathological and cognitive variables into a complex systems framework. Our study objectives were: (1) to construct bio-cognitive networks illustrating how different measure of brain structure are associated with measures of cognitive functioning within distinct stages of cognitive decline, and (2) to compare these network structures across different AD risk states, shedding light on distinct patterns of association between neuropathological and cognitive measures at specific clinical stages.

Methods: Measures from the COMPASS-ND cohort (Chertkow et al., 2019) were used to generate separate regularized mixed graphical models (Haslbeck & Waldorp, 2020) for cognitively normal (CN, n = 90) aging, subjective cognitive decline (SCD, n = 127), mild cognitive impairment (MCI, n = 327), and AD (n = 134) groups. Measures selected for network models included neuroanatomical (hippocampal volume and white matter burden), neuropsychological (test scores across various cognitive domains), and relevant sociodemographic (age, education, sex) variables. Preliminary analyses included identification of salient associations within each group network model as well as comparison of networks across different clinical groups.

Results: Male sex was associated with decreased white matter burden (WMB) in clinical groups as well as poorer performance on verbal tasks. High WMB was strongly associated with age and female sex in SCD and MCI. Hippocampal volume was positively associated with free recall tasks in MCI and AD groups. Additionally, we replicated a previous finding (Grunden & Phillips, Submitted) where age becomes less associated with cognitive measures as clinical impairment progresses across groups.

Conclusion: Network analysis applied to bio-cognitive data is a promising method for researchers to harness multivariate complexity and clarify the brain-behavior associations expressed during stages of AD risk. Network approaches should be explored further as a method of highlighting unique neurocognitive relationships that may serve as targets for early AD detection and intervention.

The Comprehensive Approach to Dementia Data Monitoring in Canada (CADDM) Project: Developing a Holistic Model of Dementia

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Background/Objectives: The current Canadian Chronic Disease Surveillance System provides overall and age-adjusted incidence and prevalence rates of dementia, and age-standardized mortality rates, all stratified by sex. A dementia surveillance system should reflect the heterogeneous nature of dementia by tracking more fully the various factors that increase the risk of developing dementia or affect someone's experience living with dementia to understand dementia better and support future health care planning and programs. The objective of this project is to develop an evidence-informed, comprehensive, and holistic person-centred framework to inform the enhancement and expansion of dementia data collection and monitoring in Canada.

Methods: The Holistic Model of Dementia was 1) developed from a realist review of peer-reviewed research literature on factors affecting the risk and experience of dementia; 2) refined through 28 Pan-Canadian focus groups and interviews involving 17 persons living with dementia and 78 care partners from diverse backgrounds (e.g., ethnic and linguistic communities, sexual identities and geographic regions); and 3) finalized and validated by partners and collaborators (e.g., persons living with dementia, care partners, advisory committee, project partners).

Results: The Holistic Model of Dementia describes the broad range of factors that influence the development of dementia and the experience of living with dementia. Factors identified span four domains: 1) individual; 2) social, community and cultural networks; 3) structural living and working conditions; and 4) general socioeconomic, policy and environmental conditions. Additionally, findings from the focus groups and interviews revealed diverse and complex experiences of individuals impacted by dementia. Results from the realist review and focus groups/interviews were integrated into the Holistic Model of Dementia; while some degree of overlap existed, new insights were discovered, such as the role of language, culture, rurality, medication management and healthcare system that influence people's experiences with dementia. The Holistic Model of Dementia was received positively by various partners and collaborators, and they shared that their experiences and perspectives resonated with factors in the model and findings from the focus groups and interviews.

Conclusion: Data from this project will aim to inform an enhanced dementia surveillance system that captures the significant heterogeneity of the dementia experience. Understanding this heterogeneity that exists can help to identify people living with dementia who share similar characteristics and needs, thus supporting novel and more person-centred planning, program, clinical service development, as well as treatment and management of dementia. These initiatives can inform changes to the healthcare system to enhance the quality of life of affected Canadians.

DELIGHT: a New Lifestyle Program for Persons Living with Dementia and Their Family Care Partners

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Background/Objectives: Persons living in the community with dementia and their care partners have the right to community supports and services that promote their well-being. However, most individuals receive few resources to live as well as possible post diagnosis. Multi-component lifestyle interventions are a focus of dementia prevention, but less so for people living with dementia. Evidence-based programming that enhances quality of life is needed. We will discuss the feasibility and preliminary effectiveness of the Dementia Lifestyle Intervention for Getting Healthy Together (DELIGHT) program, co-designed with individuals with lived experience of dementia, health care and community service providers and researchers.

Methods: DELIGHT is an 8-week, twice per week program. Each session includes 50-60 minutes of exercise and 30-minutes of facilitated group education, where a healthy snack is offered. Educational discussions focus on healthy eating, physical activity, social connection, mental well-being and sleep. A healthy eating topic is discussed once per week with a healthy snack aligned with the topic. To date, two virtual pilot sessions (n= 19) (during the pandemic) and two in-person pilot sessions (n=17) have been conducted and evaluated for feasibility (e.g. attendance, retention), as well as preliminary effectiveness (e.g. quality of life, function, physical activity, loneliness, and friendship ratings). Assessments were completed by trained assessors at baseline and end of the 8-week period. Interviews were completed with participants after the intervention, with reflexive thematic analysis used to generate themes.

Results: Virtual average attendance was 78% and in-person 90%; 89.5% and 94% completed the program for the virtual and in-person offerings, respectively. Pre- to post-intervention comparison of objective measures noted trends toward improvement in: sit- to-stand (n=17; median 14.3 (range 8.5-24.5) vs. 13.1 (range 8.4- 19.7) seconds), Dementia Quality of Life scale (n=17; median 90 (range 63- 105) vs. 96 (range 55- 111)), Physical Activity Scale for the Elderly (n=17; median 96 (range 8.6- 268.5) vs. 115.6 (8.3-216.5)), Friendship Scale (n=12; median 23 (range 15-30) vs. 28 (20-30.0)) and the Loneliness Scale (n= 12; median 4 (range 3-8) vs. 3.5 (range 3-9)). DELIGHT promoted improvement in day-to-day and other meaningful activities and fostered hope and empowerment to live well. Being part of a group that met routinely for group activity and learning contributed to feelings of being accepted and connected to their community, sharing, and learning from others, and improved well-being.

Conclusion: DELIGHT was feasible and well-accepted by participants in both virtual and in-person formats. Due to the small sample size, statistical testing was not completed for effectiveness outcomes. Next steps in the development and evaluation of DELIGHT include scaling and replicating the sessions in YMCA and other community centres, translating the program into Mandarin and Cantonese for delivery in Chinese-specific community groups, and expanding the virtual program for rural use. Evaluation outcomes will also be expanded to assess other aspects of well-being and food intake.

Evaluating the Effectiveness of the Butterfly Model of Care for Elderly Patients with Dementia

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Background/Objectives: Dementia is an umbrella term that encompasses over 55 diseases that contribute to cognitive decline. Approximately 76,000 Canadians are diagnosed with dementia each year. The number of Canadians living with dementia is predicted to double in the next 20 years. As individuals experience cognitive decline, they become more reliant on their physical environment. The Butterfly Model of Care is a person-centered emotion-focused care model that uses bright colours and interactive activities to engage patients with dementia. The objective of the retrospective study was to evaluate the efficacy of the Butterfly Model in a hospital acute care of elderly (ACE) unit.

Methods: Following a REB submission and approval a retrospective review of all patient notes for a comparative time period was done using data from Meditech and DATIX. The Cohen-Mansfield Agitation Inventory (CMAI) guided identification of key patient behaviours. Inclusion criteria

- Subjects hospitalized in the ACE unit of BCH during one of the two study periods (January - December 2019 or February - May 2023). • Subjects had or given a dementia-related diagnosis during their stay in the ACE unit. Exclusion criteria
- Subject comatose or quadriplegic, and could not fall or require physical restraints. • Subject had other neurological conditions. Relevant data from patient charts was extracted and documented on a data collection spreadsheet created specifically for this study. Statistical analyses were conducted in SPSS and R. Descriptive statistics were used to describe the demographics of the sample while inferential tests were used to identify significant differences in the outcomes.

Results: A total of 173 patients n the Acute Care of the Elderly unit with dementia where screened as per inclusion exclusion criteria. Mean age of both cohorts was 80 yrs for males and 86 yrs for females. In the post-Butterfly model cohort, 5 CMAI behaviors showed a decrease in means with respect to age matched cohorts. The behaviours included inappropriate dressing or disrobing, kicking, screaming, negativism, and falls. In addition there was a decrease in PRN antipsychotic use, and the use of first-generation antipsychotic was also reduced. Medical orders of Haloperidol lactate, Quetiapine and Respiridone where reduced in the post butterfly model cohort. Intramuscular haloperidol lactate is used for prompt control of patients with acute agitation, with decrease correlating with symptom profile of post butterfly cohort. Use of first generation antipsychotics went down from 18% to 8% with an increase in third generation antipsychotic use, from 80 to 85%.

Conclusion: The Butterfly Model has effectively changed how behavioural and psychological symptoms of dementia and antipsychotic use are managed on the ACE unit. These findings are largely consistent with the observations from local long-term care homes (Vogel, 2018). Future studies include a matched-cohort prospective study of Butterfly Model vs. non-Butterfly Model units at the hospital. A qualitative study of the experiences of healthcare providers, patients and families on Butterfly Model vs. non-Butterfly Model units is also in the works. In 2023, Osler's Seniors Health program became the world's first hospital acute care of elderly unit to be accredited in the model.

Cerebral Small Vessel Disease and Alzheimer's Disease Susceptibility: A Genome-Wide Interaction Study

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Background/Objectives: Alzheimer's disease (AD) is the commonest cause of dementia, involving progressive cognitive and functional decline. Although numerous genomic risk factors for AD diagnosis or related phenotypes have been identified, factors underlying disease progression remain unclear. People with AD dementia typically have multiple comorbid pathologies at autopsy, one of the commonest being cerebral small vessel disease (cSVD). Previous studies reported heterogenous relations between cSVD and AD, leaving their underlying molecular pathogenesis and interrelation incompletely understood. Our genome-wide interaction study (GWIS) aims to identify genetic variants that interact with cSVD in relation to AD clinical outcomes and moderate the cSVD-AD relationship.

Methods: This is a cross-sectional study utilizing data on a homogeneous European population [Total N=1019] with AD [n=131] or mild cognitive impairment [n=438], or normal cognition [n=443] from the Alzheimer's Disease Neuroimaging Initiative (ADNI). Cerebrospinal fluid (CSF) Aβ42, tau, and phosphorylated-tau levels (which are biomarkers of amyloidosis and neurodegeneration respectively) were measured using Roche Elecsys immunoassays. White matter hyperintensity (WMH) volumes—a marker of cSVD were measured from MRI scans via automated atlas-based segmentation using 3D-T1 and FLAIR sequences. Brain regional volumes were obtained using FreeSurfer on 1.5T and 3T MRI T1-weighted images. Genome-wide SNP × WMH interactions for clinical outcomes were conducted using PLINK2 (covariates: age, sex, diagnosis, Mini-Mental State Exam performance, APOE-ε4 status, head size, and 4 genetic principal components). Linkage disequilibrium-based clumping (LD and physical distance thresholds: 0.5; 250kb) was performed in PLINK1.9 and visualized with Locus Zooms Package v2.1 (reference dataset: GENCODE v42 Genes Annotation).

Results: Genome-wide significance was observed for SNP x WMH interactions in relation to CSF-Aβ42 for an intergenic locus of 30 SNPs on chromosome 18 (lowest p-value-SNP: rs72899960 T>A, β=227.0, SE=10.2, p=2.30×10-8, MAF=10.6%, Imputation R2>0.99%, n=848). The nearest gene of this intergenic locus is a novel long noncoding RNA (lncRNA) gene, ENSG00000286844 (-360KB). Genome-wide significant SNP × WMH interactions was also observed in relation to total hippocampal volume for an MIR4300HG intronic genetic locus of 9 SNPs on chromosome 11 (lowest p-value-SNP: rs3912008 C>T, β =252.9, SE=44.25, p=1.47×10-8, MAF=22.6%, R2>99%, n=987). An additive allele dosage-dependent moderation effect was observed for both intergenic-rs72899960 and MIR4300-rs3912008 on WMH-CSF-Aβ42 and WMH-hippocampal volume relationships respectively. In both cases, the heterozygous genotypes (intergenic-rs72899960-TA and MIR4300-rs3912008-CT) reduced strengths of the negative WMH-CSF-Aβ42 and WMH-hippocampal relationships respectively. Additionally, the minor allele homozygosity (intergenic-rs72899960-AA and MIR4300-rs3912008-TT) further reversed the negative WMH-CSF-Aβ42 and WMH-hippocampal relationships to become positive.

Conclusion: Our GWIS identified novel genetic variants that may moderate the cSVD-AD relationship. Previously, many lnRNA genes have been implicated in AD pathogenesis, such as amyloid and tau proteinopathies, neuroinflammation, synaptic impairment and oxidative stress etc. Interestingly, MIR4300HG has been implicated in multiple disease conditions and was suggested to be functionally associated with AD, but its functional mechanism is unclear. Our results uncover a potential regulatory role of lncRNA genes in the cSVD-AD relationship. However, this study is limited by its small sample size and cross-sectional study design. Future replication in larger datasets and assessment of clinical outcomes longitudinally is required.

Comparison Between Behavioural and Psychological Symptoms of Dementia According to Antihypertensive Medications that Stimulate or Inhibit Angiotensin II Receptors: A Pilot Study

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Background/Objectives: Behavioural and psychological symptoms of dementia (BPSD) are common symptoms of individuals living with Alzheimer's disease and related dementias. Recent literature has demonstrated that antihypertensives (AHs) that stimulate type 2 and 4 angiotensin II receptors (2,4 ATII) (Angiotensin II receptor blockers, dihydropyridine calcium channel blockers (CCB), and thiazides), may provide protection against cognitive decline compared to the ones that inhibit type 2 and/or 4 ATII (ACE inhibitors, beta blockers and non-dihydropyridine CCBs (N-CCBs). Previous studies have not explored the impact of AHs on BPSD.

Methods: Baseline data was obtained from the Standardizing Care for Neuropsychiatric Symptoms and Quality of Life in Dementia (StaN) study. AHs were coded based on 2,4 ATII simulating or inhibiting properties. Neuropsychiatric symptoms were assessed by using the Neuropsychiatric Inventory Clinician Rating Scale (NPI-C). Two-tailed T-tests were used to compare NPI sub-scores across these groups. Participants treated with two or more AHs or not on any AHs were excluded.

Results: The study included 49 participants (Male = 27, Female = 22), 22 were receiving 2,4ATII stimulating medications Mean age (SD) = 80.7 (9.9) and 79.8 (9.0) years and the median Functional Assessment Staging Tool (FAST) scale of dementia was 6d and 6e in 2,4ATII stimulating and inhibiting group, respectively. Participants who were on 2,4 ATII stimulating medications had higher disinhibition NPI sub-score as compared to 2,4 ATII inhibitors (11.0 (12.7) vs. 4.15 (7.1),P= 0.032). There were no differences for dysphoria (4.73 (10.4) vs 1.52 (3.5)), elation (2.36 (5.3) vs 0.26 (1.0), apathy (4.59 (9.5) vs 3.19 (6.5)), aberrant motor disturbances (3.41 (6.4) vs 1.48 (3.2)), appetite and eating disorder (0.45 (1.3) vs 0.15 (0.6)) or vocalization (5.73 (7.2) vs 3.81 (4.5)). Other neuropsychiatric symptoms were similar between the two groups.

Conclusion: Our results suggest that higher levels of certain BPSD in individuals taking 2,4 ATII stimulating antihypertensives. Further studies are needed to examine this relationship in larger samples.

Drug-Related Problems in Persons with Cognitive Impairment and Dementia in Primary-Care Based Memory Clinics: Generating and Prioritizing a Research Agenda Using a Nominal Group Technique

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Background/Objectives: Persons with cognitive impairment and dementia are at risk for a multitude of drug-related problems making them vulnerable to adverse outcomes. Pharmacists integrated within interdisciplinary primary-care based memory clinics conduct medication reviews in older adults with dementia. Despite the integration of pharmacists within interdisciplinary memory clinics, no comprehensive assessment of the impact of medication reviews has been conducted in Canada. Therefore, the primary objective of this study was to generate and prioritize research questions about medication use and reviews collaboratively with stakeholders, including persons with cognitive impairment and dementia and their care partners, pharmacists, and healthcare professionals.

Methods: Nominal group technique, a collaborative brainstorming process that requires active involvement from all participants and takes all viewpoints into account, was utilized to generate and prioritize the research questions. Three meetings with stakeholders were conducted; two virtual plenary sessions and one blended virtual and in-person meeting. The two plenary sessions consisted of six presentations designed to provide contextual information on medication use and reviews. During the third blended meeting, 19 stakeholders were divided into small groups based on their respective discipline. Groups consisted of care-partners of persons with dementia (n = 4), pharmacists and physicians (n=9), and social workers and occupational therapists (n=6). Participants in each group were asked, “What are the most relevant questions to ask about assessing medication use and reviews in people with cognitive impairment and dementia?” Following idea generation and clarification, ideas were grouped into themes and participants voted on the five most relevant themes.

Results: A total of 104 ideas and questions were generated and organized into 24 themes. Examples of themes included medication safety, affordability, patient and family goals of care and medication adherence. Pharmacists and physicians prioritized the effectiveness of medication reviews at both the patient and system levels, as well as medication management processes and support. Health care providers recognized the value of the patient’s knowledge regarding their medications and general health. Care partners expressed the need to incorporate medication overviews and history to ensure the most effective medications are prescribed. The top themes were further refined by the research team into 4 research questions. The finalized research questions aim to examine the impact of medication reviews on deprescribing of inappropriate medications, medication management capacity and adherence, quality of life and cost utility.

Conclusion: This study adopted an inclusive approach to identify and prioritize key research questions that can examine the impact of medication reviews conducted in memory clinics. By utilizing a nominal group technique, care partners of individuals with dementia, physicians, pharmacists, social workers and occupational therapists were provided with an opportunity to not only voice their opinions on research questions about the impact of medication reviews that were of value to them but also participate in a consensus building exercise to prioritize this research. This inclusive approach will ensure outcomes of value to these stakeholders will be measured in the study.

The Relationship Between Mild Behavioral Impairment (MBI) and Quality of Life in Older Canadian Adults in CAN-PROTECT

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Background/Objectives: Mild behavioral impairment (MBI) is a dementia risk indicator characterized by later-life onset of persistent neuropsychiatric symptoms (NPS). Quality of life (QoL) is a multi-dimensional concept that measures individual health, well-being, standard of living, physical/emotional fulfillment, and satisfaction with life. Given the links between QoL and health outcomes, it is worthwhile assessing QoL in MBI, to measure the consequences of MBI in more concrete terms beyond behavioural change. Here, we investigated this understudied relationship between MBI and self-reported QoL. We hypothesized that more severe MBI symptoms would be associated with poorer QoL, and this would differ between males and females.

Methods: The sample comprised 1107 participants from the Canadian Platform for Research Online to Investigate Health, Quality of Life, Cognition, Behaviour, Function, and Caregiving in Aging (CAN-PROTECT), a brain-aging study recruiting participants ≥40 years of age. MBI severity was measured using the Mild Behavioral Impairment Checklist (MBI-C), with higher scores indicating more severe behavioral symptoms. QoL was self-assessed using the EuroQol-5D (EQ-5D), with higher scores reflecting poorer QoL. Linear regression modelled the association between MBI (predictor) and QoL (outcome), adjusting for age, education, ethnic origin, marital status, employment status, high blood pressure and heart disease. A 90% winsorization reduced the leverage of outliers in EQ-5D score and education. Effect modification by sex was assessed with a MBI*sex interaction term. A sensitivity analysis was conducted by repeating the analysis without the EQ-5D anxiety/depression items, to ensure that the association between MBI and QoL did not depend on common items across measures.

Results: The mean age±standard deviation (SD) of participants was 64.4±7.2 years, with 79.4% of the sample being female. The mean±SD total years of education was 15.4±4.2. Among participants, 48.7% identified with having some North American origins and 84.6% identified with having some European origins. The study revealed that 71.1% of participants reported being married. The mean±SD MBI score was 5.4±7.6, and the mean±SD EQ-5D score was 6.8±1.7. After adjustment for covariates, every 1-point increase in MBI severity was associated with a 0.10-point higher EQ-5D score (95% confidence interval (CI): 0.09 - 0.12, $p< 0.001$). This association was not significantly moderated by sex ($p=0.453$). The sensitivity analysis showed that even after removing anxiety/depression from the EQ-5D, MBI was still significantly associated with poorer quality of life ($b = 0.07$, 95% CI: 0.06 - 0.08, $p< 0.001$). The sensitivity analysis was also not significantly moderated by sex ($p=0.411$).

Conclusion: In this sample of older Canadians, greater MBI severity was associated with poorer QoL, independent of sex. These results suggest that emergent and persistent behavioral symptoms in dementia-free older adults may have widespread sequelae, reflected by poorer QoL. These findings provide further support for the importance of identifying the NPS that meet MBI criteria, for potential treatment or investigation. Further research should determine if treating MBI symptoms will result in improved QoL, and if improvement in MBI and/or QoL will change the longitudinal trajectory of cognition and function in this vulnerable group.

Interactive Effects of Age at Menopause, Hormone Therapy, and APOE Genotype on Prospective Cognition in Postmenopausal Women

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Background/Objectives: Earlier menopause is associated with increased risk for cognitive impairment and Alzheimer's disease (AD). Hormone therapies (HT) containing estrogens may ameliorate these risks, and APOE genotype may further modify the effects of age at menopause and/or HT on cognitive outcomes. Here, we investigated whether age at menopause was associated with 3-year prospective cognition in a large cohort of postmenopausal women. We also tested whether history of estrogens-containing HT modified the association of age at menopause with prospective cognition. Finally, we explored whether the relationships of age at menopause and/or estrogens-containing HT with cognition differed by APOE genotype.

Methods: We included data from N=6,442 cisgender postmenopausal women in the Canadian Longitudinal Study on Aging (mean age=64.5±8.46 years, mean age-at-menopause=50.1±4.60 years, 33.9% with history of estrogens-containing HT). Age at menopause and history of HT were self-reported. We included all types of HT containing estrogens, including opposed and unopposed estrogens. Participants were classified as APOE ε2 carriers (N=899), APOE ε4 carriers (N=1,541), or APOE ε3/3 carriers (N=4,002). APOE ε2/4 carriers were excluded. Cognition was measured with a global cognitive composite at baseline and 3-year follow-up. A series of linear models tested interactive effects of age at menopause, estrogens-containing HT, and/or APOE genotype on cognitive scores at 3-year follow-up, adjusting for baseline cognitive scores, baseline age, years of education, test language (English/French), vascular risk burden, and cumulative HT exposure (in years).

Results: Earlier menopause was associated with lower cognitive scores at 3-year follow-up compared to later menopause ($\beta=0.032$, $p<.001$). History of estrogens-containing HT attenuated the negative association of earlier menopause with lower cognitive scores at follow-up ($\beta=-0.29$, $p=.04$). The three-way interaction between age at menopause, estrogens-containing HT, and APOE genotype was not significant, suggesting that APOE genotype does not further modify the interactive association of age at menopause and estrogens-containing HT on follow-up cognition. However, there was a significant interaction between estrogens-containing HT and APOE genotype after adjusting for age at menopause. Specifically, estrogens-containing HT (vs. no HT) was associated with higher cognitive scores among APOE ε2 carriers compared to APOE ε3/3 carriers (β=0.121, p=.005). Conversely, estrogens-containing HT was not associated with differential effects on cognition in APOE ε4 (vs. APOE ε3/3) carriers (β=0.0001, p=.99).

Conclusion: Earlier menopause is associated with increased risk for cognitive decline, suggesting that earlier depletion of endogenous estradiol may contribute to AD risk in women. Estrogens-containing HT may protect cognitive health in women with earlier menopause, and the effects of HT on cognition may differ by APOE genotype. These findings have implications for the development of precision interventions to prevent and treat women's dementia. Future research should seek to elucidate the mechanisms underpinning the interplay between endocrine and genetic risk factors in relation to women's brain health.

Patient Age and Sex Do Not Appear to Influence Clinical Decision Making Around a Blood Biomarker Test for the Evaluation of Cognitive Impairment

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Background/Objectives: Patient age and sex represent key non-clinical influences on clinical decision-making. Yet few clinical trials in Alzheimer's disease (AD) explicitly analyze and report age and sex effects on diagnosis, treatment, and management. The objective of this study was to examine whether patient age or sex influenced clinicians' result interpretation of a clinically validated mass spectrometry blood biomarker test for brain amyloid pathology. The blood test measured amyloid beta 42/40 and ApoE blood biomarkers that were combined with patient age (PrecivityAD® blood test) in symptomatic patients evaluated for AD or other causes of cognitive decline.

Methods: The QUIP I Study (ClinicalTrials.gov Identifier: NCT05477056) was a prospective, single-arm cohort study among patients aged 60 and older evaluated for AD and other causes of cognitive decline. The primary study outcomes were patient selection and result interpretation associated with PrecivityAD blood testing. In a subgroup analysis, we measured the effect of age and sex on clinical decision making (diagnostic certainty of AD and medication prescribing). The blood biomarker (BBM) test result was reported as the Amyloid Probability Score (APS), which measures the likelihood of a positive result on an amyloid PET scan. Clinical decision making was recorded by clinician survey pre- and post-BBM testing. The study population included 347 patients from 15 US sites evaluated by 29 neurologists and 14 other cognitive specialists. The study patients included 56% (194/347) females and an average age was 74 years old.

Results: Clinician-reported probability of AD changed pre-test to post-test from 58% to 23% (Low APS group) and from 71% to 89% (High APS group) ($p < 0.0001$ for all APS groups). The relationships between APS and change in diagnostic certainty were preserved in a subgroup ANOVA analysis by age (p=0.344 for Low APS, p=0.292 for High APS) as well as a subgroup t-test analysis by sex (p=0.167 for Low APS, p=0.213 for High APS). Overall use of AD drug therapy decreased from 48% to 26% (Low APS group) and increased from 56% to 88% (High APS group) ($p < 0.0001$ pre- to post-testing for all APS groups). The relationships between APS and change in medication prescribing were preserved in a subgroup chi-square test analysis by age (p=0.4534 for Low APS, p=0.9939 for High APS) as well as a chi-square test analysis by sex (p=1 for Low APS, p=0.931 for High APS).

Conclusion: Better and earlier detection and management of patients with symptoms of cognitive decline represent major areas of unmet need. While PET and CSF biomarker tests show high test performance, they are burdensome, costly, and invasive for both patients and physicians. We have previously demonstrated the clinical validity and clinical utility of the PrecivityAD blood test. The current study results support a conclusion that the clinical management based on the results of the PrecivityAD blood test is not influenced by patient age and sex and thus help to underscore the usefulness and generalizability of this BBM in clinical care pathways.

Effect of COVID-19 Attributable Social Impact on Older Adults in Relation to Mild Behavioral Impairment Symptom Severity

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Background/Objectives: The COVID-19 pandemic limited social interactions and increased isolation in vulnerable older adults, factors associated with dementia risk. Mild behavioral impairment (MBI), characterized by the de novo emergence in later-life of persistent neuropsychiatric symptoms, is also a significant risk factor for dementia. We investigated the cross-sectional relationship between the social impact of the pandemic and MBI in mid- to late-life adults enrolled in the Canadian Platform for Research Online to Investigate Health, Quality of Life, Cognition, Behaviour, Function, and Caregiving in Aging (CAN-PROTECT) study. We hypothesized that greater COVID-19 social impact would be associated with increased MBI severity.

Methods: A standardized score for COVID-19 attributable social impact was developed from 11 questions related to reduced in-person contact and limited social gatherings.

Severity of MBI was measured using the Mild Behavioral Impairment Checklist (MBI-C). MBI+ status was determined using a validated MBI-C cut-point of ≥8. Zero-inflated negative binomial regressions were used to model the relationship between COVID impact (exposure) and MBI-C global and domain-specific severity scores (outcome). Logistic regression was used to model the odds of global MBI+ status as a function of COVID impact. All models adjusted for age, sex, years of education, ethnocultural origin, marital status, job status, revised Everyday Cognition (ECog-II) score, history of COVID-19 diagnosis, and number of vaccine doses administered.

Results: The sample comprised 942 participants (79.3% female) with a mean age of 63.3 ± 8.5 years. Every standard deviation increase in COVID-19 impact score was associated with a 14% higher MBI total score (95% confidence interval (CI): 6.0% - 33.0%, p = 0.001) and a 25% greater odds of being MBI+ (95% CI: 4.9% - 43.3%, p = 0.02). Social impact had a different magnitude of effect within each of the MBI domains. A one standard deviation increase in COVID-19 impact was associated with 19.6% greater decreased motivation (95% CI: 8.5% - 28.0%), 12.7% greater affective dysregulation (95% CI: 3.5% - 21.9%), and 12.7% greater impulse dyscontrol (95% CI: 3.0% - 22.4%) severity scores. Neither social inappropriateness (β = 5.1%, CI: -13.0% - 24.0%, p = 0.54) nor abnormal perception (β = 12.7%, CI: -6.0% - 32.0%, p = 0.19) were associated with COVID-19 impact.

Conclusion: These findings underscore the profound effect of the pandemic, and the relationship between social disruption and behavioral risk for dementia. Greater social impact attributable to the COVID-19 pandemic was linked to greater odds and severity of global MBI, in addition to decreased motivation, affective dysregulation, and impulse dyscontrol. The results emphasize the importance of developing effective social strategies and support systems to promote healthy aging, mitigate negative outcomes of pandemic-like social disruptions, and enhance well-being in this population. Future studies should investigate whether the relationship between social factors and MBI extend beyond the circumstances of the COVID-19 pandemic.

Neuroinflammatory Biomarkers in Neurodegenerative Disease: Insights from the ONDRI Cohort

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Background/Objectives: Neuroinflammation (NI) has been implicated in both the pathogenesis of and neuroprotection against neurodegenerative diseases (NDs) (Psenicka et al., 2021), and is mediated by astrocyte and microglia activation. Plasma glial fibrillary acidic protein (GFAP), and Neurofilament light (NFL) are measures of astrogliosis and neuro-axonal damage, respectively, which can be quantified from blood or cerebrospinal fluid samples. Free-water diffusion (FWD) has been proposed as a neuroimaging-based neuroinflammatory biomarker (Pasternak et al., 2009), however some studies have observed relationships between FWD and neurodegeneration (Nakaya et al., 2022; Tago et al., 2019). We investigated whether FWD reflects astrogliosis or neuro-axonal damage across NDs.

Methods: The Ontario Neurodegenerative Disease Research Initiative (ONDRI) dataset includes neuroimaging and biofluid data from >500 patients with Alzheimer's Disease/Mild Cognitive Impairment (ADMCI), Frontotemporal Dementia (FTD), Parkinson's Disease (PD), Amyotrophic Lateral Sclerosis (ALS) and Vascular Disease-Related Cognitive Impairment (VCI). Diffusion and structural MRI data from a subset of the ONDRI cohort was used to generate FWD maps in a preliminary dataset of 367 subjects (108 ADMCI, 37 ALS, 42 FTD, 122 PD, 58 VCI). FWD maps were generated according to Pasternack et al., (2009) using in-house MATLAB code. Plasma GFAP and NFL concentrations were measured using the Simoa Human Neurology 4-Plex E assay. Recursive Feature Elimination on regional FWD was used to identify which ROIs are the most important predictors in this dataset, and a Deep Neural Network was used to identify whether selected features were more strongly predictive of GFAP or NFL.

Results: In cortical grey matter (cGM), FWD is correlated with GFAP (Left-cGM; R=0.2, p=0.0001, Right-cGM; R=0.18, p=0.0002) but not with NFL across the whole group. Recursive Feature Elimination revealed that the middle frontal gyrus, temporal pole, superior temporal gyrus, lateral occipital cortex, and parahippocampal gyrus are the most important features to predict GFAP, whereas the frontal pole, superior parietal lobule, and left cerebral white matter are the most important features to predict NFL. A deep learning model was then used to predict either GFAP or NFL concentration using selected features along with group, biomarkers indicative of AD pathology (pTau-181 concentration), age, sex, and ethnicity. A data split of 80% for training and 20% for testing were employed to develop and evaluate our model. The results showed that the selected features predict GFAP (Rtrain=0.89, Rtest=0.83) more strongly that NFL (Rtrain=0.72, Rtest=0.42).

Conclusion: In our dataset of ND patients, FWD overall is more strongly related to astrogliosis than neuro-axonal damage. Feature selection methods allowed for the generation of a model including regional FWD, demographic and AD biofluid biomarkers, that predicted GFAP with a much higher strength than NFL. Further research is needed to disentangle the effect of neuroinflammation and neurodegeneration on FWD, including other markers for neuroinflammation (sTREM2, YKL-40, TSPO). Future studies will investigate the relationship between FWD and cognitive function, disease progression as well as other markers of neuroinflammation across neurodegenerative diseases.

Improving Collaboration between Palliative Care and Neurology in Neurodegenerative Disease Populations: Focus on Patient, Family and Healthcare Provider Experience

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Background/Objectives: Neurodegenerative diseases are characterized by incurable, progressive cognitive and physical decline. Thus, early palliative care integration into dementia care is paramount to increase quality of life and advanced care planning (ACP) conversations for patients/caregivers. A paucity exists in the literature on an ideal integration of palliative care into dementia care and few existing clinics addressing this need. The UHN Supportive Care Memory Clinic (SCMC) was established between Neurology and Palliative Care to support earlier, high-quality ACP discussions. Our study aims to assess the impact of the SCMC on patients/caregivers and health care practitioners' (HCP) experiences.

Methods: Quality improvement and research ethics approval was obtained for the current study in March 2021. 3 neurology HCPs, 6 Palliative care HCPs and 11 family members of SCMC patients have been included from April 2021 to present (Patient Mean Age = 70.8, 6M/5F). During the clinic visits, ACP conversations follow an evidence-based structured and standardized conversation guide. After the clinic visit, patient/caregiver experience surveys were conducted over the phone by a member of the research team. Both neurology and palliative care HCPs completed surveys assessing satisfaction with various elements of working within the SCMC clinic.

Results: All caregivers rated feeling extremely satisfied or satisfied with discussions within the clinic visit (1 neutral). All caregivers strongly agreed or agreed that palliative care and ACP conversations are important. All but 1 participant rated the ACP discussions occurring at the right time. All palliative care HCPs strongly agreed or agreed that referrals were appropriate, an effective collaboration between neurology and palliative care exists, enjoyment working within the SCMC and most participants (1/6 strongly agree, 3/6 agree, 2/6 neutral) wanted to continue working in the clinic. For neurology HCPs, all participants strongly agreed that involving palliative care was helpful, ACP discussions were highly important, enjoyment working together, and would continue to work in this model. All neurology HCPs either strongly disagreed or disagreed that the clinic increased their workload, and all reported an increase in confidence in leading care discussions after this collaboration.

Conclusion: Results of our preliminary data analysis suggest that our collaborative clinic model addresses an important, unmet need within dementia care. Caregiver and HCP experiences overall have been overwhelmingly positive. Ongoing evaluation of the impact of our program will inform continuous quality improvement for the SCMC and hopefully, future implementation of integrated outpatient models of care between palliative care and neurology for other subspecialties and centres.

Comparing Psychotropic Medication Usage in Sporadic and Genetic Behavioural-Variant Frontotemporal Dementia

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Background/Objectives: Previous research has reported that patients with behavioral-variant frontotemporal dementia (bvFTD) have a higher need for psychotropic medications. However, no current information exists on whether psychotropic medication usage differs between sporadic and genetic bvFTD patients. We aimed to investigate whether psychotropic medication usage differs between patients with sporadic and genetic bvFTD and whether there is an interaction with sex.

Methods: We used data from a multi-centric, international study (ALLFTD) on sporadic and genetic FTD. We included 653 bvFTD with known genetic status, data on medication use and Clinical Dementia Rating (CDR) scale. We also analyzed information on age of onset (AoO), education years, current symptoms, Neuropsychiatric Inventory Questionnaire score (NPI) and Geriatric Depression Scale score (GDS). We included the following medications: citalopram, duloxetine, escitalopram, fluoxetine, gabapentin, mirtazapine, paroxetine, quetiapine, sertraline, venlafaxine, bupropion, alprazolam, clonazepam, lorazepam, and trazodone. The outcome was the ordinal number of medications. We analyzed three ordinal logistic models comparing sporadic and genetic bvFTD. In the first model, we evaluated the association of the medication number with only the dichotomic genetic status; in the second model, we adjusted for the CDR stage; and in the last model, we controlled for CDR, sex, education years, NPI and GDS.

Results: 360 sporadic bvFTD-disease patients (AoO 58.2± 9.1 years, 135 (37.5%) female, CDR distribution: 0.5:6.7%; 1:38.3%; 2:44.7%; 3:10.3%; NPI 11.7±6.7, GDS 3.5±3.5, and psychotropic medication usage: zero:31.4%; one:39.7%; two:22.5%; three:4.7%; four:1.4%; five:0.3%) were compared to 293 genetic bvFTD (AoO 52.2±10.4 years, 145 (49.5%) females, CDR distribution: 0.5:5.8 %; 1:28.7%; 2:50.9%; 3:14.7%; NPI 9.8±6.6, GDS 2.7±3.0, and psychotropic medication usage: zero:51.5%; one:28.7%; two:14.3%; three:4.4%; four:0.7%; five:0.3%. In the unadjusted model, sporadic bvFTD patients had OR of 2.03 (CI95%: 1.52 to 2.71) for using more medications. In the CDR-adjusted model, sporadic bvFTD had an increased OR of 2.25 (CI95%:1.67 to 3.03). Finally, in the fully adjusted model, sporadic bvFTD had an OR of 1.78 (CI95%: 1.26 to 2.58). Also, NPI increased the OR by 1.09 (CI95%: 1.06 to 1.12), and GDS increased the OR by 1.11 (CI95%: 1.05 to 1.18), both for 1-point increase. Education and AoO were not associated with the outcome.

Conclusion: In the ALLFTD cohort, patients with sporadic bvFTD have a higher risk of using more psychotropic medications than genetic bvFTD. This increased medication use persists after controlling for CDR, NPI and GDS. Further investigation is required to understand better the reason for differences in psychotropic medication usage between sporadic and genetic BvFTD.

Hearing Loss and Speech-in-noise Perception is Associated with Brain Network Connectivity in Older Adults with or at Risk for Dementia: An Analysis of COMPASS-ND Data

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Background/Objectives: Hearing loss (HL) is a risk-factor for dementia that is prevalent in older adults. Altered brain connectivity is present in individuals with HL and in individuals with or at risk for dementia. Altered brain connectivity has been associated with cognitive impairment in individuals with HL and degree of cognitive impairment and disease progression in individuals with and at risk for dementia. Therefore, altered brain connectivity is a potential mechanism explaining why HL is associated with increased dementia risk. Despite this, the relationship between HL and brain network connectivity in individuals with and at risk for dementia has been understudied.

Methods: Data are from the Comprehensive Assessment of Neurodegeneration in Dementia study (Data Release 6, May 2023). Participants are older adults with various degrees of cognitive impairment and include cognitively unimpaired (CU, n=78, age=69.53, %female=77%), subjective cognitive impairment (SCI, n=85, age=70.01, %female=74%), mild cognitive impairment (MCI, n=159, age=72.22, %female=40%), and Alzheimer's disease groups (AD, n=63, age=74.13, %female=35%). Anatomical and resting-state scans were collected following the Canadian Dementia Imaging Protocol (Duchesne et al., 2019). Independent component analysis was used to identify the default-mode network (DMN), a resting-state-network that is altered in individuals with and at risk for dementia. Hearing data include a pure-tone hearing screening protocol and speech-in-noise perception. Analyses of covariance compared DMN connectivity between normal hearing and HL individuals (grouped based on the pure-tone hearing screening), in each diagnostic group (CU, SCI, MCI, and AD). Linear regressions evaluated the relationship between speech-in-noise perception and DMN connectivity in each diagnostic group.

Results: Preliminary results are available for 94 older adults with MCI, 60 with normal hearing and 34 with pure-tone HL. Compared to those with MCI and normal hearing, those with MCI and pure-tone HL had decreased connectivity between the DMN and the caudate and thalamus. There was no relationship between DMN connectivity and speech-in-noise perception. Based on these preliminary results, it is expected that DMN connectivity will differ between the pure-tone HL and normal hearing groups of the CU and SCI participants and not differ between the normal hearing and pure-tone HL groups of the AD participants, due to the accumulation of AD-related brain pathology in these participants. It is expected that speech-in-noise perception will be associated with DMN connectivity in the CU and SCI groups and that there will be no relationship between speech-in-noise perception and DMN connectivity in the MCI or AD groups, due to AD-related brain pathology.

Conclusion: Preliminary results suggest that the increased dementia-risk in individuals with HL may be due to decreased functional connectivity between resting-state-networks and several cortical regions, including those involved in sensory-processing and higher-order cognition. Results suggest that pure-tone HL and speech-in-noise perception are differentially related to brain connectivity in older adults with MCI. The absence of a relationship between either hearing measure and connectivity in the AD group would suggest that the accumulation of AD-related brain pathology precludes the relationship between HL and brain connectivity. These findings are novel, no other studies have examined HL and functional connectivity in these diagnostic groups.

Investigating Commonalities in Neurodegenerative Imaging Patterns of Type 2 Diabetes and Alzheimer's Disease

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Background/Objectives: Type 2 diabetes (T2D) is a common health condition associated with cognitive impairment and dementia. Both type 2 diabetes and Alzheimer's disease are associated with neurodegeneration, but the extent to which their patterns of brain atrophy overlap is not well understood. This study compared neurodegeneration patterns associated with T2D and AD. Specifically, we aimed to investigate whether T2D neural degeneration patterns resemble those in AD and identify commonalities and differences between these two diseases.

Methods: We analyzed data from participants aged 40-69 years at baseline in the United Kingdom Biobank (UKBB) for whom a brain MRI was acquired (n= 43,172) as well as data from participants (n = 2316) in the Alzheimer's Disease

Neuroimaging Initiative (ADNI) study. We used cerebral morphometry results obtained from processing anatomical MRI images with the Freesurfer software. We divided our sample in four groups based on cognitive status (AD patients or cognitively healthy controls) and presence of T2D (positive or negative). We then created brain maps of the impact of AD and T2D on cortical thickness using general linear models. We then compared AD and T2D maps using permutation-based tests that accounted for spatial autocorrelation.

Results: Our results show similarity in patterns of neural degeneration (atrophy) in T2D and AD, particularly in the temporal and parietal regions. Furthermore, we are seeking evidence that T2D individuals have greater atrophy in parts of the brain that are also affected in AD, such as the hippocampus.

Conclusion: Using our findings, we hope to shed light on the similarities and differences between neural degeneration patterns associated with T2D and AD. These findings may have implications for the prevention and treatment of these diseases.

Machine Learning Approaches for Identifying Frailty-Related Sub-Types of Alzheimer's and Vascular Dementia

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Background/Objectives: As the global population ages, the number of people living with dementia (PLWD) rises. Frailty is a risk factor for Alzheimer's disease (AD) and vascular dementia (VaD), impacting the relationship between neuropathology, genetics, and dementia. Leveraging large medical datasets and machine learning, we can gain insights into diseases. Unraveling the intricate relationships between frailty, dementia, neuropathology, and genetics, requires a sophisticated approach. This study employs unsupervised machine learning on the UK Biobank database to identify frailty subtypes in AD and VaD. The findings could offer vital information for enhancing patient care and prognosis, shaping the future of dementia management.

Methods: We analyze multi-modal data from the UK Biobank and included prevalent cases of AD (n= 3127) and VaD (n=2181). We will utilize participants electronic health records, self-reported measures, brain MRI, and polygenic risk scores. We will implement unsupervised clustering algorithm like k-means (a-priori clustering method), affinity propagation (identifies natural groupings in the dementia population without prior cluster knowledge), and latent class analysis (suits categorical or discrete data). Further, we will assess the association between clusters and 1-year mortality using Cox regression models, adjusted for age and sex. Time-dependent receiver-operating curves (ROC) and C-statistics will be examined to compare the predictive performance of models.

Results: We expect that clustering algorithms will reveal groups of PLWD based on shared patterns of regional brain atrophy, degree of frailty, and polygenic risk. It is anticipated that clusters characterized by high levels of frailty, brain atrophy, and polygenic risk will be significantly associated with mortality. The Cox regression models will provide estimates of hazard ratios, confidence intervals, and p-values, indicating the strength and significance of these associations. Additionally, time-dependent ROC analysis and C-statistics will assess the discriminatory power of the clusters in predicting 1-year mortality.

Conclusion: The clusters of AD and VaD that are obtained by leveraging large medical datasets and implementing machine learning algorithms may enhance understanding of AD and VaD sub-types. This study will provide information for the early detection and personalized management of these conditions to potentially influence change in health care practice and policy.

Validity of Accelerometry Data to Identify and Monitor Agitation and/or Aggression in Persons Living with Dementia: Results from a Diagnostic Test Accuracy Systematic Review

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Background/Objectives: Wearable sensor technology (WST) may provide an objective means of measuring and analyzing physiological signals related to problematic behaviors in persons living with dementia (PLWD). If proven valid, these technological advancements offer promising opportunities for the timely detection and monitoring of neuropsychiatric symptoms (NPS). Agitation and aggression are two NPS that are associated with changes in motor activity in PLWD. We aimed to investigate the evidence pertaining to the diagnostic test accuracy of accelerometry devices to detect and monitor agitation and aggression in PLWD.

Methods: This was part of a larger systematic review assessing the use of WST for NPS detection and monitoring in PLWD carried out from inception until September 2022 (https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=219917). Our systematic literature search was carried out in 7 health science and engineering library databases including Ovid MEDLINE ALL(R), EMBASE Classic + EMBASE, PsycINFO, EBSCOhost CINAHL, Scopus Inception, Compendex, INSPEC, GEOBASE, and IEEE Xplore. A meta-analysis was conducted for studies reporting correlation results by converting correlations into Fisher's Z scores to calculate 95% confidence intervals using the R Studio Metacor package. Fixed effects and DerSimonian and Laird's random effects models and heterogeneity were assessed.

Results: A total of 12,928 articles were identified, from which 84 titles were retained for analysis. In total, 5 studies that provided 7 samples examined the validity of accelerometer signal data for assessing and monitoring agitation and/or aggression in PLWD and reported correlations between motor activity and agitation (n=5) and aggression (n=2). One single-blinded trial and four observational studies were included that involved participants with various dementia types and stages of severity. Three of the studies tested commercially available accelerometric or actigraphic devices. Reference standard tests used included the CMAI, ABS, NPI-NH, and the BEHAVE-AD. Correlations ranged from 0.27 to 0.49 and the fixed effect model indicated that the pooled correlation across studies was 0.47 [0.37; 0.57] with no heterogeneity (I2=0%).

Conclusion: Our study indicates that accelerometry can provide consistently moderate diagnostic test accuracy for the detection and monitoring of agitation and aggression episodes in PLWD. Future research should focus on improvements in research methods, such as standardized reporting of the procedures used, including signal threshold ranges, outcome measures, devices and reference standards.

Improving Care across the Dementia Behavioural Care Continuum—A Novel Collaborative Approach

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Background/Objectives: Globally, the number of people living with dementia is increasing. Caregivers and care partners are challenged in navigating complicated health care systems while managing and supporting a person with complex behavioural psychiatric symptoms. We know the importance of keeping a person in their environment to reduce unnecessary transitions. As this increase in dementia multiplies, we must consider more innovative, collaborative integrated care. OBJECTIVE: To determine efficacy of our continuum of behavioural care highlighting BSO, VBM and 4W

Methods: Baycrest operates several programs that service individuals with responsive behaviours. We will describe a novel integrated continuum of care. The Virtual Behavioural Medicine (VBM) program is seen as a novel care escalation option for patients with unmanaged neuropsychiatric symptoms of dementia (NPS). The Ontario Ministry of Long-Term Care recognizes this program as a solution to enhance dementia care for people with severe, unmanaged NPS through a quick response virtual consult and management program wherever they are located – be it Long Term Care, Acute Care, Specialty Behavioural Units or community. Behaviour Supports Ontario (BSO) is a provincial system resource in all sectors for those with NPS. Baycrest is the lead/host BSO organization in Toronto Region. The Behavioural Neurology Unit (BNU) is a 20-bed locked unit for patients with refractory behaviours who cannot be safely managed in their existing environment. The BNU team

Results: Published in the Journal of Alzheimer's Disease (2022, we found that the majority of people (60.42%) waiting for an in-patient admission to our BNU were successfully treated in VBM and did not require admission. Due to the success of VBM, the BNU is caring for more patients with the most intractable behaviours. To address these challenges, collaborative work is ongoing to find solutions. As these in-patient units are a limited resource, it is important they are reserved for patients with the most intractable behaviours. BSO, VBM and BNU services work collaboratively to integrate dementia care. This involves integration of admission and discharge processes, as well as BSO, VBM, and BNU partnerships with the receiving and sending care teams and/or families as the patient transitions along the continuum. In addition, with the success of VBM, we have launched an expansion VBM program at UHN Toronto Rehab to spread the innovation.

Conclusion: VBM is a novel virtual neurobehavioural unit to treat individuals in place, reduce emergency visits and acute care hospital admissions. Our innovative integrated care addresses systems issues within our current care model. Through the utilization of frontline BSO services along different points of care in diverse settings, we are able to refer more complex cases to VBM and treat successfully, with the most intractable cases admitted to our BNU.

Cognitive and Gait Effects of Repetitive Transcranial Magnetic Stimulation in Patients with Treatment-Resistant Late-Life Depression and Motoric-Cognitive Risk Syndrome (CogniTReaD-TMS): Protocol and Preliminary Feasibility for a Randomized Controlled Trial

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Background/Objectives: Motoric-cognitive risk syndrome (MCRS) (characterized by slowed gait and cognitive complaints) and treatment-resistant late-life depression (TR-LLD) have been described as risk factors for dementia and gait impairments. Repetitive transcranial magnetic stimulation (rTMS) has emerged as a safe and effective treatment for TR-LLD. We theorize that patients with TR-LLD will meet the criteria for MCRS, and that rTMS will significantly modify the MCRS signature, which is considered a predementia marker. In this pilot trial, we aim to determine the effectiveness of rTMS in terms of improving gait/cognitive functions in patients with TR-LLD ± MCRS.

Methods: This study is a two-arm, waitlist-controlled, single-blinded, randomized trial that will evaluate the efficacy of rTMS on improving dual-task cost/gait performance and cognitive functions (e.g., ADAS-Cog-13 and plus modalities, MoCA, colour word interference test) of patients with TR-LLD ± MCRS. The presence of MCRS among eligible participants with TR-LLD will be subsequently confirmed using standard criteria. We will also explore rTMS' effects on mood and anxiety, health-related quality of life, activities of daily living, and clinical global impression. A minimum of 30 patients will be recruited for the study, and they will be monitored at 4 different time points over a period of 7 weeks (specifically, at Week 0, Week 4, Week 6, and Week 7) to achieve a statistical power of at least 85%. We will analyze our data using general/generalized linear mixed models.

Results: This study has received full approval from the Provincial and Centre Initial Applications of Clinical Trials Ontario (CTO), is being registered on the clinicaltrials.gov website, and recruitment is active at Ontario Shores Centre for Mental Health Sciences site. The rationale, methodology, and preliminary feasibility of our research will be presented and discussed.

Conclusion: This study will be the first of its kind, exploring the role of rTMS in modifying MCRS signature in those with TR-LLD. This proposed study shall identify the potential benefits of rTMS on a dementia risk marker (i.e., MCRS) in patients with TR-LLD, estimate the effect size to allow a future larger multicentre trial, and allow understanding of the basic mechanism of the effect of depression on cognition.

Repetitive Transcranial Magnetic Stimulation for Apathy in Patients with Neurodegenerative Conditions, Cognitive Impairment, Stroke, and Traumatic Brain Injury: A Systematic Review

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Background/Objectives: Apathy is one of the clinical features in various neuropsychiatric disorders that may significantly interfere with rehabilitation efforts toward independent living and social participation. Recently, it has been reported that repetitive transcranial magnetic stimulation (rTMS) may have therapeutic effects on cognitive function. We aimed to determine the effects and tolerability of rTMS on apathy in patients with neurodegenerative conditions, mild cognitive impairment (MCI), stroke, and traumatic brain injury (TBI) via systematic review of relevant studies.

Methods: We conducted a systematic search in major electronic health databases, including PubMed, Scopus, and PsychINFO, covering the period from inception to June 2023. Comparative clinical trials and cohort studies, and studies with before-after designs were considered for inclusion. We used the Cochrane Risk of Bias and the National Institutes of Health (NIH) tools to assess methodological quality. Two reviewers conducted the study selection, risk of bias assessment, and data extraction; a third reviewer was consulted for any discrepancies. All data were analyzed qualitatively.

Results: Fourteen studies met our eligibility criteria (11 randomized controlled trials (RCT) and 3 studies utilized before-and-after designs) (n = 418). The stimulation parameters used varied considerably across the studies. The summary findings of our review indicate the following observations on the effects of rTMS on apathy: (1) the results of all included studies in Alzheimer's disease investigating the effects of rTMS on apathy have consistently shown a positive impact on apathy; (2) the majority of studies conducted in Parkinson's disease have not found statistically significant results; (3) a single study (RCT) on patients with primary progressive aphasia demonstrated significant beneficial effects of rTMS on apathy; (4) the trials conducted on individuals with MCI yielded varying conclusions; (5) one study (RCT) in chronic stroke suggested that rTMS might have the potential to improve apathy; and (6) one study in mild TBI did not find a significant rTMS effect on apathy.

Conclusion: The feasibility of utilizing rTMS as a treatment for apathy has been suggested in this review. Overall, limited evidence suggests that rTMS intervention may have the potential to modify apathy among patients with AD, PPA, MCI and chronic stroke, but less so in PD and mild TBI. These findings require confirmation by larger, well-designed clinical trials.

Towards Advancements in Alzheimer's Detection: A Retrospective Analysis of Blood-Based Biomarkers and Their Relation to Tau and Amyloid PET Scans in Alzheimer's Clinical Trials

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Background/Objectives: Background: Novel immune-based therapies have shown promise as a treatment for Alzheimer's disease. Detection of β-amyloid and Tau proteins in the brain are necessary steps for their use. Until recently, this has depended on the use of positron emission scanning (PET scans) and/or detection of levels in cerebrospinal fluid (CSF), which are costly and resource-limited. Blood-based biomarkers hold promise as a more widely-available and cheaper option. Objective: To analyze the utility of the blood biomarkers, phosphorylated-tau181 (pTau181), phosphorylated-tau217 (pTau217) and plasma β-amyloid 42/40 (Aβ42/40) as an initial screening method for potential treatment with novel, immune-based treatments for Alzheimer's Disease.

Methods: We conducted a retrospective analysis of consecutive participants from three separate randomized, double-blind trials which employed a blood biomarker screening strategy. All blood samples were collected and processed as per the pre-specified trial protocols. The official analysis and PET scan results occurred at a location separate from the screening centre. All data was calculated as raw percentages without weighting.

Results: A total of 68 participants across three separate drug trials were analyzed. 15 of 29 (51.7%) individuals tested positive for pTau. Of the 15 participants who tested positive, 12 went onto PET scans (3 excluded for imaging/genetic exclusion criteria). 12 of 12 (100%) demonstrated Tau positivity on their PET scan. 13 of 39 (33.3%) individuals tested positive for Aβ42/40. 8 of these participants (5 excluded for imaging/genetic exclusion criteria) proceeded to PET scans. 8 of 8 (100%) of these participants demonstrated amyloid positivity on their PET scans.

Conclusion: In our mixed sample of data from participants from different drug trials, we see that blood-based biomarkers performed favourably with the PET scan. All participants who had positive blood-based biomarkers subsequently had a positive PET scan. Further studies are warranted to determine the positive predictive value and the merit for use as an alternative to PET scans and CSF for the detection of amyloid and Tau proteins in clinical settings.

Cerebral Focal WMH Co-Locate with Transcerebral Intramedullary Vessels and Can Vary Over Time

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Background/Objectives: The origin of white matter hyperintensities (WMH) on MRI in Alzheimer's disease (AD) is not fully understood. Recent evidence suggests the perivascular surface of arterioles and venules may serve as cerebral lymphatics for homeostasis of interstitial fluid and toxic metabolite clearance. We hypothesized this system could be injured by age-related vascular wall damage, particularly venous collagenosis in AD, where focal WMH could be an early marker of this injury. We investigated whether superficial focal WMH's spatially co-localize transcerebral intramedullary venules, and if varied over time as expected, may reflect perivenular vasogenic edema which could change dynamically.

Methods: We examined107 AD and 30 healthy older adults normal controls (NC) (mean age=74 yrs) with 3D-T1 and T2/FLAIR or SWI MRI at the baseline and follow up (ISI=1.5 years). Cerebral focal WMH was defined as lesions on T2/FLAIR <10mm in diameter. Intramedullary vessels were defined as linear streaks on T1, inverted T2 or SWI, which represented transcerebral venules visible on MRI. T2/FLAIR was co-registered to the T1 space. The spatial relationship of each focal WMH with the intramedullary vessels was classified as either 'perivascular positive' if a lesion was overlapped or centered around an intramedullary vessel or otherwise as 'perivascular negative'. To test the hypothesis that WMH reflects vasogenic edema or fluid in nature, we reasoned that WMH would exhibit dynamic change over time, each focal WMH was followed from time1 to time2 and visually categorized by size as: significantly increased, decreased (including disappeared in time2), or unchanged.

Results: At baseline, a total of 1630 focal WMH were identified. 1493 (91.6%) focal WMH were perivascular, in which the majority were deemed venular-related. At follow-up, perivascular-distributed WMH had 49 (6.9%) decreased, 209 (29.2%) increased, and 457 (63.9%) unchanged in size. AD patients had a higher rate of focal WMH increase (χ^2=6.23, p=0.012), while NC had a higher rate of focal WMH unchanged over time (χ^2=5.16, p=0.023). Anatomical features of majority of deep intramedullary vessels, such as connection with lateral ventricle and trans-cerebral feature, were consistent with deep medullary veins. Focal WMH were mostly in the frontal (60.2%) and occipitoparietal (32.2%) regions, along the frontal and posterior angles of the lateral ventricles, the areas with highest distribution of intramedullary venules, which further supported the association of focal WMH with deep medullary venules. We did identify a few focal WMH which were ischemic perivenular lacunar infarcts.

Conclusion: Our detailed radiological lesion analysis revealed that most focal WMH were distributed along intramedullary vessels, particularly the venules. Their dynamic fluctuation as they progressed over time was compatible with the notion that they are fluid in nature and not necessarily always indicative of ischemic lacunes as previously thought. Focal WMH may relate to multiple underlying pathologies, but our findings suggest venous insufficiency of deep intramedullary venules may be an important substrate of superficial focal WMH.

Periventricular White Matter Hyperintensities Co-Localize with Deep Intramedullary Venules, Sparing Compact Fiber Tracts and Can Increase or Decrease Over Time in Alzheimer's Disease

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Background/Objectives: Periventricular white matter hyperintensities (pvWMH) on T2 MRI are prevalent brain lesions in older adults. As deep white matter ischemia and demyelination were thought to be related to pvWMH, severe WMH were exclusionary for anti-amyloid treatment trials. However, age-related occlusive venulopathy of deep medullary veins

(DMVs) has been implicated in pvWMH. Not only leakage but also perivascular lymphatic system stasis may lead to chronic excessive extracellular fluid accumulation. In vivo, we investigated collocation of confluent pvWMH with DMVs and radiological evidence of white matter edema in Alzheimer's disease (AD). Tissue and vascular pathology were analyzed in cases with autopsy.

Methods: 88 AD and 33 healthy older adults (age=76) with confluent pvWMH were included. Confluent pvWMH was defined as a lesion in at least one of six periventricular locations extending >10mm from the lateral ventricles on T2/FLAIR. DMVs were defined as linear streaks on T1 radiating from the subependymal region of the lateral ventricle toward the cerebral surface. The spatial relationship of confluent pvWMH was measured by counting the number of DMVs in each confluent pvWMH. Radiological signs of edema of confluent pvWMH were determined by examining whether compact white matter tracts (including the optic radiation, fronto-occipital fasciculus, thalamofrontal tract and u-fibers) were spared within or around pvWMH. Assuming that WMH would exhibit dynamic changes if they are fluid or edema related, pvWMH changes averaged over 18 months were analyzed. Perivascular spaces and periventricular lacunar infarcts were also quantified. Imaging-pathological correlates were in available 13 autopsy cases to validate imaging findings.

Results: DMVs were identified across each case for a total of 175 discrete confluent pvWMH, and significant associations were demonstrated between pvWMH volume and the total number of DMVs depicted within the pvWMH. Collocation of pvWMH with DMVs, resembling tiger stripes, appeared to be unique by comparing them to regions without pvWMH. Compact fiber tracts were spared in confluent pvWMH by 98.3% overall, and 24% of pvWMH volumes decreased over time. Pathologically, using trichrome staining, collagenosis of large venules ($p=0.012$) (vein wall thickening and stenosis) and smaller venules ($p=0.036$) (stenosis and occlusion) were the most significant predictors of pvWMH. Demyelination inferred on luxol blue staining contributed but did not survive multiple regression.

Conclusion: Confluent pvWMH clearly mapped to DMVs, suggesting venous insufficiency with dilation/collagenous wall thickening of large intramedullary venules as confirmed pathologically. Compact fiber tract sparing and reversible progression of pvWMH on T2/FLAIR provided new radiological evidence of chronic edema. Our findings support the notion that venous insufficiency of deep intramedullary veins is the main substrate of pvWMH, reflecting vasogenic edema induced from increased venous pressure and extracellular fluid accumulation from reduced interstitial fluid circulation along the glymphatic perivenous spaces to ischemia and demyelination. Pathophysiology of intramedullary venous insufficiency warrants further pathological investigation including trichrome staining to identify vascular contributions to dementia.

Rare Neurovascular Genetic and Imaging Markers Across Neurodegenerative Diseases

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Background/Objectives: Cerebral small vessel disease (SVD) is common in patients with cognitive impairment and neurodegenerative diseases such as Alzheimer's and Parkinson's. This study investigated the burden of magnetic resonance imaging (MRI)-based markers of SVD in patients with neurodegenerative diseases as a function of rare genetic variant carrier status.

Methods: The Ontario Neurodegenerative Disease Research Initiative study included 520 participants, recruited from 14 tertiary care centers, diagnosed with various neurodegenerative diseases and determined the carrier status of rare non-synonymous variants in five genes (ABCC6, COL4A1/COL4A2, NOTCH3/HTRA1).

Results: NOTCH3/HTRA1 were found to significantly influence SVD neuroimaging outcomes; however, the mechanisms by which these variants contribute to disease progression or worsen clinical correlates are not yet understood.

Conclusion: Further studies are needed to develop genetic and imaging neurovascular markers to enhance our understanding of their potential contribution to neurodegenerative diseases.

Mindfulness as Therapy for Mild Cognitive Impairment: Developing Programs Through Community Partnerships

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Background/Objectives: Non-pharmacological interventions that encourage self-management are key for people with mild cognitive impairment. Recent evidence suggests that mindfulness training can support this need (Wells et al, 2019). However, many mindfulness training programs are not necessarily designed to address the specific needs of the MCI population, and sometimes even exclude persons with MCI from participating. In 2021, the Neil and Susan Manning Cognitive Health Initiative (CHI,) a partnership between the Vancouver Island Health Authority, Universities of BC and Victoria, and the Victoria Hospitals Foundation, partnered with the BC Association for Living Mindfully (BCALM) to create a specialized mindfulness program for MCI.

Methods: The BCALM-CHI collaboration created a specialized MCI course, based on Mindfulness Based Stress Reduction (MBSR), designed to develop community capacity. The study objectives were to: 1) Increase self-management capacity for early cognitive impairment participants; 2) Address the programming gap in outpatient and community-based services in the Victoria region for persons with MCI; and 3) Contribute to the growing evidence-base for mindfulness interventions with the MCI population. Phase 1: Delivery of the standard BCALM program to evaluate its fit with the MCI population. Phase 2: Pilot testing of an adapted version of the BCALM course version which catered to the MCI population. During the first phase, two MCI-specific mindfulness pilot courses were run, one virtually and one in-person. The program involved meeting once a week, over an 8-week period. Study participants were recruited from the Seniors Outpatient Clinic in Victoria, BC. They completed surveys to assess cognition, mood and functional performance.

Results: After Phase 1, post MCI-specific course participant surveys indicated: • More than 90% of participants expressed overall improvement across multiple areas, including memory and coping; • Approximately 80% of participants noticed improved abilities and confidence to manage a self-identified, meaningful memory-related challenge; and • Key recommendations for future MCI mindfulness offerings which included (1) paring down the written content of the manual, (2) expanding meditations involving the senses and everyday activity/movement, and (3) adjusting the prescription for home practice.

Conclusion: BCALM and the CHI continue to support this specialized MCI mindfulness programming and evolve the program as more groups are run. By building a coalition with BCALM, Island Health has been able to boost community capacity to access this specialized program in a sustainable manner, while addressing gaps in service. Further work is planned to compare the MCI mindfulness training program against more traditional psychoeducational program in a clinical trial.

A Systematic Review of Non-benzodiazepine Anticonvulsants in the Treatment of Behavioral Symptoms in Dementia

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Background/Objectives: Behavioural and psychological symptoms in dementia (BPSD) is very common in people with neurocognitive disorders, is significantly distressing to the person living with dementia, and contributes to increased caregiver burden and health care costs. Non-pharmacological interventions are the first line treatment for BPSD but individuals who do not respond to these interventions might require pharmacological interventions. It is important for clinicians to understand the risks and benefits of various classes of drugs used in BPSD. We conducted a systematic review of efficacy and side effects of anticonvulsants in BPSD.

Methods: Our study protocol was registered with the international prospective register of systematic reviews (PROSPERO CRD42017079826). Per protocol, we searched 5 electronic databases for randomized controlled trials and systematically reviews evaluating the efficacy of non-benzodiazepine anticonvulsants in the treatment of BPSD. Title, abstract and full text screening as well as data extraction and risk of bias analysis were performed independently by two investigators and disagreements resolved by a third investigator. Risk of bias was assessed using the Cochrane risk of bias tool (version 1). When statistical pooling of results using meta-analysis was not feasible, we synthesized findings using the Cochrane Synthesis Without Meta-analysis reporting guidelines.

Results: We found 12 studies that met our inclusion criteria. Four trials (n = 97 participants) evaluated carbamazepine, one of which demonstrated an improvement in the Brief Psychiatric Rating Scale measuring agitation, hostility, psychosis and withdrawal/depression (effect size: 1.13; 95% confidence interval 0.54-1.73) relative to placebo. However,74% of patients receiving carbamazepine (20 of 27) experienced adverse effects, compared with 21% (5 of 24) of patients receiving placebo. The remaining carbamazepine trials were limited by sample size and poor methodology. We identified one good quality systematic review, summarizing evidence from five clinical trials with the overall conclusion that valproic acid is likely ineffective for BPSD. There is low quality evidence that oxcarbazepine is likely ineffective and that topiramate may be comparable to risperidone. We did not find any randomized controlled trials evaluating gabapentin, pregabalin, phenytoin, levetiracetam, zonisamide, lamotrigine, or phenobarbital as treatments of BPSD.

Conclusion: We found that anticonvulsants are generally not effective treatments for BPSD and that they may be associated with a higher prevalence of adverse events. However, the quality of the existing literature is low, limited by small sample sizes, short follow-up duration, and incomplete reporting. While the anticonvulsants included in this study, particularly carbamazepine and valproic acid may not require additional studies to conclude that they are ineffective in the treatment of BPSD, anticonvulsants like pregabalin and gabapentin which have some promising results in case studies, will require further research to understand their risks and benefits.

Successful Integration of Lived Experience Perspectives in National Dementia Research Meetings

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Background/Objectives: Engagement of People with Lived Experience of Dementia (EPLED) was a new program introduced in the Canadian Consortium on Neurodegeneration in Aging (CCNA) Phase II. EPLED's main activity has been developing and supporting an Advisory Group composed of people with diverse experiences of dementia, including people living with dementia and friends, family and caregivers. Advisory Group members have been involved in different capacities in a range of CCNA activities. We will present a short video that describes the integration of EPLED in the CCNA Partners Forum and Science Days.

Methods: This video project was an idea that was suggested by Advisory Group members as a way to share stories about EPLED's successful collaborations with researchers. It was important to Advisory Group members to choose a format would be easily accessible to a wide range of audiences, including both academic (e.g., researchers, trainees, funders) and non-academic (e.g., general public, people with lived experience). In this EPLED video project, Advisory Group members, researchers and research administrators were interviewed about their reflections and experiences collaborating in national meetings and events. Recorded discussions illustrated insights for researchers and research administrators engaging with people with lived experience, including the positive impact of collaboration and tips and strategies. Evaluation data, collected from people with lived experience, researchers and other audiences, are also presented.

Results: Through screening this EPLED video (https://vimeo.com/865945582), we will demonstrate how people with lived experience can be engaged in different aspects of research, and why this engagement is important, including the impacts it may have on both participants and audiences. Featured interviews provide insights on collaborations between EPLED Advisory Group members and researchers, including barriers to engagement. Academic and non-academic audiences will learn about the value of lived experience perspectives in research, tips and strategies for involving people with lived experience in national research meetings, the meaningful roles people with lived experience could undertake and the support they may require. It will also share evaluation data that indicate that both people with lived experience, researchers and event attendees valued this collaboration.

Conclusion: People with lived experience can take on multiple roles in planning, executing and evaluating national research meetings and events. This engagement is viewed positively by both people with lived experience, researchers and event attendees. We hope this video (https://vimeo.com/865945582) will stimulate more engagement in different aspects of research.

Practice Shorts: A Novel Approach to Build System Capacity and Disseminate Best Practice Information in a Timely and Practical Manner

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Background/Objectives: The Psychogeriatric Resource Consultants (PRC) of North Simcoe Muskoka Specialized Geriatric Services (NSMSGS), adeptly lead a virtual, 30 minute, monthly practice short education session. Aligning with the NSMSGS strategic priority to build capacity, sessions are intended to increase NSMSGS health care partners clinical practice skills. Originally, these sessions were offered only to NSMSGS staff, as a way to build capacity across a clinical team spread across a large, mostly rural region. In connecting with our broader system partners across all sectors of health care, we identified an appetite for this timely, relevant, and practical education to be disseminated further afield.

Methods: In July 2020, practice shorts were launched via Zoom Webinar to the broader NSM region. The live sessions allow for real time questions and resource sharing, and are recorded and archived as an ongoing resource. Practice shorts occur at a consistent time and day each month for ease of promotion, planning, and predictability. Feedback is collected informally, monitoring attendance (numbers/organizations), and using survey data to improve delivery. Topic selection is rooted in NSMSGS's learning needs assessment, as well as trends identified by the PRCs and system partners. Initially topics focused on supporting the transition through COVID-19, and evolved to focus on best practice initiatives and clinical guidelines. Practice short topics have covered international reports, national recommendations, provincial practice standards, and regional trends. Sessions have showcased the work and research of local clinicians and innovative programs within NSM. Speakers are selected based on their knowledge, research, and role within the system.

Results: Practice shorts have gained recognition as evidenced by a steady to increasing attendance (58-135 attendees/month) within NSM, across all sectors, and a growing interest from professionals outside the region. The PRCs are well suited to lead this initiative based on their expertise in adult learning, knowledge translation, and their working relationships and knowledge within NSMSGS and abroad. Utilizing local and expert subject matter speakers assists with conveying the relevance and trustworthiness of the content, as speakers understand regional realities and have an established presence and respected reputation. While marketed locally, the practice shorts have gained a positive standing as demonstrated by system partners sharing amongst their own networks.

Attendees have identified that they appreciate being able to attend short, succinct education which offer best practice with salient practicalities. Survey data collected (47-73% response rate) indicates that, overwhelmingly, the practice shorts are meeting stated objectives and are relevant to practice.

Conclusion: Monthly practice short sessions have become a useful vehicle to build system capacity in an efficient, practical, and accessible manner, whilst maintaining NSMSGS as a leader for disseminating best practice information regarding the care and support of older adults living with frailty and complex needs.

Are Sex and ApoE4 Status Predictors of Cognitive Reserve in Mild Cognitive Impairment?

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Background/Objectives: Mild cognitive impairment (MCI), a risk state of Alzheimer's Disease (AD), occurs when neurodegeneration (ND) beginning in the medial temporal lobe leads to cognitive deficits. ApoE4 positive women are at a greater risk of progressing from MCI to AD compared to male carriers. ApoE status has been found to increase risk independently of the neural protection of cognitive reserve (CR). CR theory stipulates that lifelong, stimulating experiences increase neuroplasticity and can delay the onset of cognitive decline, despite ND. Findings on sex differences in CR are mixed, so we sought to examine the potential effects of sex and ApoE status.

Methods: Data from the COMPASS-ND (Release 6, May 2023) study of the CCNA was taken to study our question: how do sex and ApoE status affect episodic memory and CR? Evidence for CR in a participant is operationally defined as better cognitive performance compared to the reference group when matched on level of ND. Our measure of ND is the ratio of hippocampal volume to intracranial volume (HpVR) measured by T1-weighted structural magnetic resonance imaging. The dependent variables are delayed recall scores from the Rey Auditory Verbal Learning Test, Brief Visuospatial Memory Test-Revised, and the CIMAQ Face-Name Association Task. Multiple linear regressions are being run to assess the relationship of the HpVR and each episodic memory measure, while stratifying by self-identified sex and ApoE4 status (homo- and heterozygous carriers of the E4 gene and non-carriers), respectively.

Results: Preliminary results with a sample of older adults with MCI (n=130) consists of 54 women (m Age=71±6.2years, m Education=16±3.8years) and 76 men (m Age=73±6.6years, m Education=15±4.2years). In our analyses of sex, we found that sex was not a predictor of episodic memory, but HpVR was (with larger HpVR predicting better test scores). There was no interaction between sex and hippocampal volume, indicating no sex differences in CR. When ApoE status becomes available in the next data release of COMPASS-ND (August 2023) we will examine sex and ApoE4 status on episodic memory as a function of HpVR. We previously predicted to find evidence of sex differences in CR, but our preliminary results did not support this hypothesis. Sex differences may vary with ApoE4 status, so adding it to the analysis will allow us to test them. These analyses will show the relationship between sex and ApoE4, and how CR is affected.

Conclusion: This study has shown no sex differences in CR in MCI. As we await ApoE4 status of participants, we expect to find sex differences in episodic memory scores in the non-carriers, as they would be suffering less of a pathological burden than carriers. Examining ApoE status and sex jointly, it may uncover more subtle effects of CR, since CR and ApoE-associated risk have been found to work independently of each other in their effects on cognitive function. This study has implications in early detection and preventative measures for those at an elevated risk for developing AD.

Olfactory Performance is Associated with Episodic Memory Performance and Brain Structure in Subjective Cognitive Decline: An Analysis of COMPASS-ND Data

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Background/Objectives: Olfactory dysfunction is a prevalent and early symptom of Alzheimer's disease (AD) and often precedes the core cognitive and memory impairment features of the disorder. Moreover, key brain regions integral to olfactory processing, such as the olfactory bulb, entorhinal cortex, and hippocampus, are implicated in the early pathophysiology of the disorder. Previous work has suggested olfactory deficits may be detectible in individuals with subjective cognitive decline (SCD), the earliest at-risk stage of AD. Few studies, however, have examined brain changes in regions critical to olfactory processing, including the olfactory bulb, in this population.

Methods: Data from the 6th data release of the Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) were used, including T1- and T2-weighted structural MRI images alongside clinical and neuropsychological data. Participants included individuals with SCD (n = 85), mild cognitive impairment (MCI; n = 159), AD (n = 63), and cognitively unimpaired older adults (n = 78) who served as controls. We used an olfactory bulb segmentation algorithm developed by Estrada and colleagues to segment the olfactory bulb, the Multiple Automatically Generated Templates Brain pipeline to segment the hippocampus, and CIVET 2.1 to obtain measures of cortical thickness. General linear models and partial correlations were used to examine group differences in brain structure and the associations between brain structure, olfactory disfunction, as measured by the Brief Smell Identification Test, and measures of cognition, including the Montreal

Cognitive Assessment, the Rey Auditory Verbal Learning Test, and the Brief Visuospatial Memory Test-Revised.

Results: We observed groupwise deficits in olfactory and cognitive function in MCI and AD groups relative to controls ($p < 0.01$), but not between the SCD and control groups ($p > 0.05$). Poorer cognitive performance, however, was related to worse olfaction in the SCD group but not in controls ($p < 0.05$). We observed reduced hippocampal volumes and patterns of thinner cortex in the MCI and AD groups relative to controls. Thinner cortex in the left and right entorhinal cortex ($p \leq 0.01$) and reduced volumes in the bilateral subiculum ($p = 0.02$) were seen in the SCD group relative to controls. Finally, there were significant associations between atrophy in brain regions critical to olfaction and poorer cognitive function in the SCD group ($p < 0.01$) that are not observed in controls. Analyses of the olfactory bulb will be reported, and we hypothesise stepwise decreases in volume across the AD spectrum.

Conclusion: Taken together these findings suggest that there is a coupling of olfaction, memory performance, and brain structure in individuals with SCD that is not present in controls, despite broadly similar sensory and cognitive performance and brain structure. These data contribute to the potential utility of measuring olfactory performance as a non-invasive and reliable biomarker in SCD for conversion to later stages of the AD continuum.

Interest in Cognitive Health Among Individuals with Subjective Cognitive Decline (SCD): Evidence from a Canadian Sample

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Background/Objectives: Subjective Cognitive Decline (SCD) is a state where individuals report cognitive decline that does not show up on formal testing. SCD has been linked to Alzheimer's disease in some individuals who could potentially benefit from lifestyle changes, such as diet, exercise, and smoking, to reduce their dementia risk. The RESILIEN-T project created an application to support individuals with SCD to set goals to maintain their cognitive health.

Methods: Ninety-four participants over the age of 60 (mean age 76.4, range 60-92 years) reporting subjective memory complaints compared to 5 years ago were recruited for a 3-month field trial of the RESILIEN-T application. Participants completed the MAC-Q (subjective memory performance), T-MoCA (brief cognitive assessment), and EQ-5D-5L (health status) plus other measures not reported here. They also provided demographic information and reported their current technology use at baseline Participants were randomly assigned to either receive a tablet containing the RESILIEN-T to use daily or to the control group.

Results: Participant's MAC-Q scores confirmed their subjective memory concerns, but different profiles emerged on the T-MoCA. Self-reported overall health was good, which they felt was better than most people their age. The participants did not require assistance with their daily activities and used technology for tasks including tracking appointments and physical health. This was more varied among the younger participants, who also expressed greater comfort using technology. In terms of lifestyle goal-setting most wanted to become more physically active and keep in touch with others. Cognition scores improved significantly ($p<.05$) in both groups on both MAC-Q and T-MoCA in the 84 participants who repeated them three months later.

Conclusion: This physically healthy sample proactively sought activities or interventions for their self-reported memory concerns, indicating a growing awareness of and interest in later life brain health. Interestingly both groups' cognitive scores improved after three months, suggesting that discussing SCD and factors that can reduce dementia risk, could benefit individuals with concerns about their cognitive health. Messaging about brain health interventions, especially those using technology, need to be matched to the different needs of the young-old and old-old. Future focus on the SCD population is indicated to identify those most at risk of developing Alzheimer's disease or other dementias.

"Where is the Rehabilitation for Falls in Dementia?" Preliminary Insights from a Qualitative Study with Dementia Stakeholders

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Background/Objectives: People with dementia are up to eight times more likely to experience falls than older adults without dementia. Increased risk is attributed to cognitive and physical factors (e.g., balance). Falls negatively impact people with dementia (e.g., hospitalization, loss of confidence/fear, deconditioning), their families, and the healthcare system through high care costs and poor long-term health outcomes. Rehabilitation is commonly offered to older adults who have fallen, with a view to preventing or reducing future falls. This study aimed to understand current fall rehabilitation for people with dementia in Canada to inform future interventions targeting fall risk factors in this population.

Methods: This study employed a qualitative descriptive design. Thirty stakeholders were recruited: Six rehabilitation researchers (83.3% female; mean age: 49.2 years), seven rehabilitation clinicians (100% female; 4 Occupational Therapists [OT], 3 Physiotherapists [PT]; mean age: 35.9 years), eight adult day program staff (87.5% female; mean age: 35.75 years), and nine family caregivers (88.9% female; mean age: 64.3 years) participated in semi-structured interviews or focus groups. Interview/focus group questions were related to balance, falls, concerns/fears about falling, rehabilitation, exercise, and cognitive impairment. Interview data were transcribed verbatim for analysis using Braun and Clarke's (2019) reflexive thematic analysis approach to identify prevalent (group-specific and overarching) themes.

Results: All participant groups strongly emphasized the unmet need for fall prevention and rehabilitation in dementia. Rehabilitation researchers shared rigid yet conflicting opinions about how 'ideal' balance and fall prevention interventions should be designed and delivered for older populations. None of the clinicians worked directly with people with dementia; rather, they worked with other cognitive disabilities (57.1% stroke), highlighting a lack of clinicians focusing on dementia. Despite this, clinicians believed that 'something was better than nothing' and worked with their clients on tailored balance rehabilitation to reduce fall risk. Day program staff highlighted barriers and benefits of engaging people with dementia in group exercise and a lack of clear parameters for fall prevention programs or access to physical rehabilitation in the community. Family caregivers described a lack of preventative action towards falls in dementia and little rehabilitative or post-diagnostic support offered for the physical challenges their family members with dementia experienced.

Conclusion: This study highlights a stark lack of attention to fall risk reduction and prevention for individuals living with dementia, despite their increased risk. Given the associated costs and harms of falls, and the vast body of literature linking cognitive and physical decline (e.g., balance, gait, etc.), there is an urgent need for clear agreement regarding fall risk reduction, fall prevention, and rehabilitative interventions made specifically to support people living with dementia.

COMPASS-ND: Progress on the Longitudinal Clinical Observational Study of the Canadian Consortium on Neurodegeneration in Aging

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Background/Objectives: COMPASS-ND is the longitudinal clinical observational study of the Canadian Consortium on Neurodegeneration in Aging. The major goals are to learn:

- Who is at risk of developing dementia
- How early dementia can be detected
- Which tests (or combination of tests) are most effective at detecting dementia It includes diagnoses from across the dementia spectrum not found in other studies and ecologically-validated groups such as mixed dementia and individuals with multiple co-morbidities.

Methods: Thirty-two Canadian clinical sites recruited 1,169 participants who completed 4-5 visits: screening, clinical, neuropsychology, MRI, and lumbar puncture. The extensive clinical and neuropsychological assessments were harmonized with other Canadian observational studies of dementia including ONDRI, CIMA-Q, CLSA. The research diagnostic groups include participants who are cognitively unimpaired (n=166), or who have subjective cognitive decline but normal cognition (n=151), as well as mild cognitive impairment (MCI; n=282), MCI with silent vascular lesions (n=147), Alzheimer's disease (n=120), mixed dementia (n=81), frontotemporal dementia (n=44), Parkinson's disease (PD; n=84), PD-MCI (n=45), PD dementia (n=16), and Lewy Body disease (n=43). The comprehensive assessment includes promising non-cognitive biomarkers of sensory function (hearing, vision, olfaction) and gait and novel computerized measures of gait at 7 sites.

Results: The Canadian Dementia Imaging Protocol was developed and acquired on over 1,090 participants. Biosamples were collected on 1,086 individuals, and core analyses included plasma biomarkers obtained from single molecular array (SIMOA): Amyloid beta (Aβ) 1-40, Aβ1-42, NfL, GFAP, phosphorylated tau (P-tau) 181. CSF was collected (in 12.5% of participants) and analyzed for Aβ1-42, total tau, P-tau 181, Alpha synuclein. Blood measures examine markers of general health, inflammation, lipidomic, synaptic function/plasticity, hormone profile and oxidative stress. Whole blood samples undergo genetic analyses (Clinical Genomics Centre, Toronto, ON), with Illumina's NeuroBooster Array for specific genes of interest. Polygenetic risk and hazard scores for Alzheimer's and Parkinson's diseases will also be generated. Autopsies have been completed on 23 participants, with 201 consenting to brain donation. Baseline alphanumeric, imaging, biomarker, and genetic data have been released in summer 2023. CCNA teams, programs, and platforms have identified 185 protected projects, with 23 publications to date.

Conclusion: Open access to the baseline data is anticipated by summer 2024, and Time 2 follow-up data is currently being collected. A Phase III funding application for Time 3 follow-up data collection is being prepared for the Fall of 2023. We anticipate expansion of the cohort to include new under-represented participants with up to Grade 12 education. COMPASS-ND is a Canadian observational study rich with data available to dementia researchers and trainees. The results from our data will have broad applicability to multiple disciplines that are involved in the care of older individuals with and without cognitive impairment.

Distinct Neuroinflammatory Mechanisms in Young-Onset and Late-Onset Alzheimer's Disease

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Background/Objectives: Neuroinflammation is implicated in the pathophysiology of Alzheimer's disease (AD). Late-onset AD (LOAD) accounts for most AD cases but 10% of cases develops disease before age of 65 and are known as young-onset AD (YOAD). Although YOAD and LOAD pathology are similar, YOAD presents with more severe gray matter atrophy, greater synaptic loss, and is more aggressive as compared to LOAD. Limited post-mortem studies have reported a hyper-reactive immune response in YOAD compared to LOAD. Our aim was to investigate, using a proteomic approach, whether distinct neuroinflammatory profiles exist in YOAD and LOAD and their relationship to markers of neurodegeneration.

Methods: Using multiplex proximity extension assay (PEA) technology from Olink (Inflammation panels), we measured 737 inflammatory proteins in cerebrospinal fluid (CSF) from 90 AD [57 YOAD; 33 LOAD], and 26 healthy controls (HC). The mean age [mean (SD)] of YOAD group was 60.84 (4.92), LOAD was 76.55 (4.48), and HC was 63.92 (8.71). ANCOVAs, adjusted for age and sex, were performed to compare the levels of inflammatory proteins among groups, with FDR correction for multiple comparisons. The relationship of inflammatory markers with neurofilament light chain (NfL), glial fibrillary acidic protein (GFAP), and normalized cognitive z-scores were examined by Pearson correlation. We utilized linear regression analysis incorporating the interaction effect of sex and disease groups to assess sex-related difference in inflammatory markers in YOAD and LOAD.

Results: Twenty-six inflammatory proteins involved in extracellular matrix regulation, neuroprotection, signal transduction, synapse maintenance, and immune regulation were significantly increased in YOAD compared to HC CSF ($q<0.05$, FDR-corrected). Only two proteins (SCRN1 and MMP10) were increased in LOAD compared to HC ($q<0.05$). Comparing YOAD and LOAD, 9 were significantly increased in YOAD. A significant correlation of NfL was found with TNFRSF4 ($r=0.59$, $q<0.00$ 1) and MILR1 ($r=0.48$, $q<0.05$) in YOAD, and with CCL17 ($r=0.63$, $q<0.05$) in LOAD. 199 proteins were significantly positively correlated with GFAP in YOAD, whereas none correlated in LOAD. A significant correlation was found between NfL and GFAP ($r=0.46$, $q<0.01$) in YOAD only. No correlations between cognitive z-score and inflammatory markers were observed in YOAD, while 24 proteins correlated positively in LOAD ($q<0.05$). Interestingly, distinct sex effects were observed, with 39 inflammatory markers being different between males and females in HC, 7 in YOAD, and 2 in LOAD.

Conclusion: YOAD and LOAD patients display distinct inflammatory profiles with diverging relationships between markers of inflammation and neurodegeneration as well as cognitive function. Sex difference in inflammatory markers was more prominent in HC as compared to AD sub-groups. Our results underscore that disruption in neuroinflammatory mechanisms could contribute to the differences observed in YOAD and LOAD.

Nurses and Personal Support Workers Perspectives of Virtual Training to Advance Expertise in Palliative Care for Persons with Dementia

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Background/Objectives: Researchers at Ontario Tech University partnered with experts from the Alzheimer's Society of Canada and Ontario Shores to develop a micro-credentialing certificate program in dementia care. This study aimed to expand upon the larger consortium project by evaluating one of the nine micro-credential modules to examine the usability and applicability of using micro-credential learning in long-term care to advance expertise in palliative care for persons with dementia.

Methods: Registered Practical Nurses (RPNs), Registered Nurses (RNs), Nurse Practitioners (NP) and Personal Support Workers (PSWs) (n=19) who worked in long-term care homes located in southern Ontario completed a one-day training session to pilot test a gamified education training on palliative care for persons with dementia. Upon completion of the training module independently, staff were invited to participate in a focus group interview to share their experience and perceptions of the usability and applicability of the training and the perceived impact on their professional practice in palliative care for persons with dementia living in long-term care.

Results: Four preliminary themes have emerged from the data, including usability and applicability of the gamified simulation learning, competencies in palliative care, gaps in palliative care and workplace training, and personal implications of palliative care work. Participants perceived that more palliative care training for long-term care staff is needed, and that dementia care is an important part of this training. Participants reported that the gamified simulation training was easy and fun to navigate, and that the module was applicable to their work with residents.

Conclusion: Palliative care for persons with dementia training is recognized to be an important part of work in long-term care as residents are often admitted with complex and life-threatening conditions. Gamified simulation training can help bridge the knowledge gap and advance competencies in nurses and PSWs to better support residents receiving palliative care services.

Canada's First National Dementia Guidelines: A Collaborative Approach to Improving the Diagnosis Experience

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Background/Objectives: Diagnosing dementia can be fraught with difficulty. Most patients are diagnosed by their family physician, who may not have had any special training in dementia assessment and diagnosis disclosure. Developing evidence-based guidelines aligned with current best practices is essential in supporting physicians. Based on prioritization from a National Survey, the Alzheimer Society of Canada (ASC) has received funding from Government of Canada (GoC) to develop guidelines that will improve the experiences of physicians, persons living with dementia and care partners through the process of disclosing and communicating a diagnosis of dementia, with a particular focus on Black and Chinese communities.

Methods: ASC has partnered with: 1) the GoC and Public Health Agency of Canada; 2) the Canadian Consensus Conference on Diagnosis and Treatment of Dementia (CCCDTD); and 3) the College of Family Physicians of Canada (CFPC) to develop the National Dementia Guidelines (NDG) Program. At the core of the program is the guideline development framework, which is comprised of six teams inclusive of community family doctors and dementia specialists, persons with lived experience, and ethnocultural groups, who work collaboratively to develop culturally competent guidelines and practical tools. These guidelines have gone through both internal and external evaluative measures and refinement from experts and community groups across Canada. The guideline methods adhered to standards from the Guidelines International Network (GIN).

Results: The six teams have developed the first NDG in Canada related to the process of disclosing and communicating a diagnosis of dementia, inclusive of eight recommendations. These recommendations include: Care Partner Presence, Identifying the Disclosing Healthcare Provider, the Environment and Appoint Structure, Topics to Discuss, Communication Technique and Terminology, Emotional Supports, Engaging Holistic Approaches, and Instilling Hope. Each recommendation includes cultural considerations provided by our two cultural community working groups. ASC is working with the GoC and our nationwide network to disseminate the guidelines. The six teams are now working to develop the associated practical knowledge, translation and exchange tools for physicians, persons living with dementia, and care partners that will enhance the uptake of these guidelines into practice.

Conclusion: The NDG Program will provide the much-needed guidance for family physicians and other clinicians to better support persons living with dementia and care partners across the continuum of care. By creating an inclusive framework focused on implementation and sustainability, ASC will be able to replicate these processes to other topic areas and populations.

Examining the Effects of an 8-Week Nature-Based Park Visit Program on the Behaviours, Quality of Life, Cognition and Caregiver Burden in Individuals with Dementia and Their Caregivers

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Background/Objectives: The increasing prevalence of people living with dementia (PLWD) in Canada has sparked a growing interest in non-pharmacological interventions to improve outcomes of PLWD. Lifestyle changes including nature-based activities have been found to offer numerous benefits to individuals without dementia. However, there is limited evidence on the effect of nature-based, outdoor activities specifically for PLWD. Objectives: The purpose of this study was to evaluate the effects of an 8-week open label park visit program on the behaviors, cognition, quality of life and caregiver burden in older adults with mild to moderate Alzheimer's disease dementia and their caregivers.

Methods: This open label pilot study focused on community-dwelling individuals with Alzheimer's disease dementia and their caregivers in Calgary, Alberta employing a pre-post design. Participants were assessed on their cognition, physical activity, and functional ability to determine eligibility for the study. The intervention involved an education session on the benefits of nature for PLWD and their caregivers, followed by 8 weeks of park visits, with approximately 120 minutes allocated to outdoor activities each week. The primary outcome was change in neuropsychiatric symptoms by the Neuropsychiatric Inventory (NPI) from baseline to Week 8. Secondary outcomes were other measures including changes in cognitive function by the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), quality of life by the Dementia Quality of Life (DEMQOL) and caregiver burden by the Zarit Burden Interview (ZBI) from baseline to Week 8.

Results: The analysis was conducted using paired t-test with a significance threshold of 0.05 on four pairs of PLWD and their caregivers. The mean age of PLWD was 76.3 ± 6.4 and 50% were female. The primary outcome, NPI total score numerically declined over time from baseline to Week 8 (mean difference -3.25, P = 0.14). For the secondary outcomes, change in cognitive function by the RBANS revealed an increase in total score at Week 8 (mean difference +8.0, P = 0.082). The DEMQOL total score increased during intervention with significant differences at Week 8 (mean difference +7.25, P = 0.0073). The ZBI total score was declined with significant differences in caregiver burden at Week 8 (mean difference -4.5, P = 0.014).

Conclusion: Overall, in this small pilot study, NPI total scores numerically declined during the park visiting program although this did not reach statistical significance. Secondary outcomes showed promising improvements in measures of quality of life and caregiver burden. These findings indicate the potential of nature-based outdoor park visits in positively impacting outcomes for PLWD and their caregivers. However, controlled trials with a larger sample size are needed to further explore the potential benefits of outdoor park visits for PLWD.

Menopausal Symptom Burden as a Predictor of Mid- to Late-Life Cognitive Function and Mild Behavioral Impairment: A Cross-Sectional CAN-PROTECT Study

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Background/Objectives: Menopause is a reproductive stage experienced by most middle-aged females spontaneously (i.e., naturally) or due to other medical reasons. There is recent evidence to suggest that symptoms of menopause, which vary across individuals, may be linked to greater risk for cognitive decline. Similarly, mild behavioral impairment (MBI), characterized by later-life emergent and persistent neuropsychiatric symptoms, is also linked to incident cognitive decline and dementia. Little is known about the relationship between menopause and the changes in behaviour and personality comprising MBI, and their links to cognition. We investigated those relationships in this study.

Methods: Cross-sectional data from 896 participants who reported they had undergone menopause from the Canadian Platform for Research Online to Investigate Health, Quality of Life, Cognition, Behaviour, Function, and Caregiving in Aging (CAN-PROTECT) were used. Menopausal symptom burden was operationalized by summing the total number of reported menopausal symptoms experienced, ranging from 0-11. MBI was measured with the MBI Checklist (MBI-C). Cognitive function was measured with the Revised Everyday Cognition (ECog-II) scale. Higher scores reflected greater severity in all three measures. To examine the relationship between menopausal symptom burden (predictor) and cognitive function (outcome), a negative binomial regression model was used. Similarly, a zero-inflated negative binomial regression was used to model the relationship between menopausal symptom burden and MBI symptoms. Both models adjusted for age, total years of education, age of menopausal onset, type of menopause (spontaneous or due to medical reasons), use of hormone replacement therapy (HRT), and birth control.

Results: Mean participant age was 64.2±7.3 years with 15.5±5.0 years of education. Mean menopausal symptom burden, ECog-II, and MBI total scores were 4.9±2.8, 11.1±10.5, 5.4±7.6, respectively. After controlling for covariates, a significant relationship between menopausal symptom burden and ECog-II was found, with every additional menopausal symptom associated with a 5.4% higher ECog-II total score (95%CI[2.8, 8.0], p<.001). Comparatively, the associations of non-estrogen- and estrogen-based HRT and/or birth control and ECog-II total score were non-significant (b=16.9, 95%CI[-10.9, 56.1], p=.3, b=-11.0, 95%CI[-25.3, 6.5], p=.2, respectively). Menopausal symptom burden was also related to MBI, with every 1-point increase in menopausal symptom score associated with a 6.1% higher MBI total burden score (95%CI[2.5, 9.8], p=.002). The use of non-estrogen-based HRT and/or birth control was not significantly related to MBI (b=-19.1, 95%CI[-44.6, 18.1], p=.3), however, use of estrogen-based HRT and/or birth-control was associated with a 26.9% lower in MBI total burden score (95%CI[-43.3, -5.7], p=.02).

Conclusion: Females who experience more menopausal symptoms in mid-life tend to report poorer cognitive function and greater MBI symptoms later in mid- to late-life. The use of estrogen-based HRT and/or birth control mitigated the relationship between menopause and MBI symptoms. These findings indicate that burden of menopausal symptoms may act as a marker for susceptibility to cognitive and behavioural decline, both of which are risk factors for incident dementia. However, longitudinal data are required to explore this hypothesis further, with biomarker data to explore mechanisms, and as well as treatment and/or preventative effects of HRT/birth control given for menopausal symptoms.

A Multimodal Prognostic Model to Forecast Clinical Progression in Early Alzheimer's Disease

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[1]Perceiv AI.

Background/Objectives: Watchful waiting is unfortunately still a very common step in the patient journey to diagnose Alzheimer's disease (AD). This delays patients from receiving definitive diagnoses, which can prevent them from accessing new therapeutic interventions in the optimal treatment time window. We present a validation study of Foresight AD, a prognostic model that forecasts cognitive and functional decline in early AD to support timelier clinical decisions.

Methods: Foresight AD is a machine learning model which was trained and cross-validated on a database of 980 individuals with early AD (i.e. mild cognitive impairment or mild dementia due to AD), and it was externally validated on a large multicenter database of over 4500 individuals. Cognitive and functional assessments, demographics, and APOE genotypes collected at baseline were used to predict the individual probability of declining or remaining stable over 24 months on the CDR-Sum of Boxes (CDR-SB).

Results: Foresight AD generalized across datasets, having achieved 75.3% Area Under the Curve (AUC) in cross-validation and 73.7% AUC in external validation. Compared to baseline, individuals progressed on the CDR-SB at 24 months by a mean (± std) of 1.3 ± 2.3 points and 1.4 ± 2.6 points in the cross-validation and external validation datasets, respectively. However, when stratified by the Foresight AD predictions, the predicted stable individuals progressed by 0.4 ± 1.4 points, while the predicted decliners progressed 5 times as quickly with an increase of 2.2 ± 2.7 points in cross-validation. These rates of clinical progression were replicated in the external validation dataset where the predicted stable individuals progressed by 0.4 ± 1.6 points and the predicted decliners progressed by 2.2 ± 2.9 points.

Conclusion: Foresight AD is able to discriminate stable individuals from likely decliners in early AD populations with 73.7% AUC. Such forecasts of clinical progression can support healthcare providers to make timelier diagnoses, thus reducing watchful waiting and allowing patients to access new therapeutic interventions earlier. Individualized forecasts of clinical progression may also facilitate the enrollment of patients into clinical trials by enriching the trial population with likely decliners in order to increase a trial's power to detect significant treatment effects.

The Dementia Society Digital Education Transformation Project: A New Virtual Person-Centered Dementia Learning Hub.

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Background/Objectives: The Dementia Society of Ottawa and Renfrew County (DSORC) has undergone unprecedented digital education changes with the onset of the pandemic in 2020; a rapid shift was necessary to enable online delivery and cater to the growing demand for support and services. DSORC understood the need, and initiated a comprehensive digital approach to ensure the mission of compassionate support, and practical education for everyone impacted by dementia while building a dementia inclusive community is carried through. Objective: To transform the Dementia Society's educational pathway to a person-centered virtual curriculum that incorporates current best practices for adult and online education.

Methods: The DSORC project for digital education transformation involved three stages: research, development, and implementation. The project started with a research phase, following a qualitative research model, and extensive review of external adult education resources and best practices for content delivery. The following phase continued by understanding the specific needs of clients conducting interviews, organizing focus groups, and seeking feedback. After evaluating the whole current Dementia Society education, a GAP analysis was performed identifying gaps and opportunities, as well as the collection and analysis of background information to determine current, and desired conditions within the entire project. Coding and data analysis was carried out to complete the gap analysis and consider key themes from the literature review from adult education theories and pedagogical models, dementia education, and educational technologies. During the development and implementation phase, a person-center online curriculum was proposed and developed using Articulate 360 (Articulate, NY).

Results: During the research phase, the interviews and focus groups were conducted between October 2022, and November 2022. In total, 15 individuals were interviewed, and six participants took part in a focus group. Data sets were compared against the literature, and themes were categorized including overarching themes and subthemes; broken down into three categories: 1) Role Specific, 2) About DSORC Education, and 3) About Dementia Education. As a result of this phase, recommendations were provided on: 1) Equity, Diversity, Inclusion and Accessibility 2) Technology and 3) Curriculum. According to the gap analysis the pandemic triggered a change in people's preferences, with more individuals becoming comfortable with online applications and communication, underscoring the importance of virtual platforms for educational purposes. Finally, seven bilingual modules and 23 bilingual courses were developed using the main recommendations provided, and a new "Dementia Learning Hub" was created and launched.

Conclusion: This Digital Education Transformation Project intended to innovate through a person-centered virtual Dementia curriculum for persons living with Dementia and their caregivers in Ottawa and Renfrew County; a new "Dementia Learning Hub ‘' was built based on modular and interactive content, including virtual experiences to learn brain health, understanding dementia, caregiving techniques, practical tips, caregiver wellness and end-of-life care. The new bilingual educational framework attends to and ensures each module includes aspects of inclusion, prevention, practical, informative, and supportive learning while also attending to the dementia disease progression.

Exploring Psychosocial Function in Older Adults with (or at Risk for) Alzheimer's Disease

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Background/Objectives: Social isolation has been identified as a potentially modifiable risk factor for Alzheimer's disease (AD; Livingston et al, 2020). In support, multiple social factors (e.g., participation in social activities, social support) and indicators of mental health (e.g., loneliness, depression) are associated with cognitive performance cross-sectionally and can predict cognitive decline and risk for AD over time. However, research on psychosocial functioning remains largely unexplored in older adults with varying degrees of cognitive function (e.g., individuals with subjective cognitive decline, mild cognitive impairment) and those with AD.

Methods: We used data from the Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) study (Data Release 6, May 2023) to examine psychosocial function in cognitively healthy controls (N=77, MAge = 69.5, MEducation = 15.8, 78% female), individuals with subjective cognitive decline (SCD, N=85, MAge = 70.2, MEducation = 16.9, 74% female) and mild cognitive impairment (MCI, N=151, MAge = 71.8, MEducation = 15.2, 38% female) who are at risk for AD, and individuals with mild AD (N=62, MAge = 73.9, MEducation = 15.5, 31% female). Psychosocial factors were measured using clinical questionnaires on mental health (e.g., Geriatric Depression Scale, Generalized Anxiety Disorder Scale), and self-reported questionnaires on perceived social function (e.g., social support, quality of life, loneliness) and engagement with social networks and structures (e.g., social participation, frequency of time spent on the telephone and with others, engagement in community activities).

Results: Linear and logistic regressions were used to characterize differences in psychosocial function across clinical groups, controlling for age, sex, and years of education. Participants with MCI demonstrated reduced subjective psychosocial functioning (e.g., depression, anxiety, quality of life, loneliness) compared to cognitively healthy controls, participants with SCD, and participants with AD. There were no group differences in social support. On structural social measures, individuals with MCI and AD report less participation in social networks (self-rated current participation, frequency of time spent on telephone and with others) and community activities compared to the other groups.

Conclusion: These findings indicate that individuals with MCI subjectively and objectively experience poor psychosocial function compared to all other clinical groups. Moreover, individuals with AD report better quality of life and less anxiety and loneliness compared to the MCI group, despite both clinical groups similarly reporting low levels of social participation. This finding may suggest a lack of awareness about changes or deficits in psychosocial function in AD. These initial findings provide groundwork for further psycho-social-cognitive analyses individuals with (or at risk for) AD to better understand the risk of poor psychosocial functioning in contributing to cognitive decline.

Incidence and Predictors of Dementia in Older Adults with Attention-Deficit/Hyperactivity Disorder

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Background/Objectives: Recent research indicates adults with attention-deficit/hyperactivity disorder (ADHD) may have an increased risk of developing dementia in later life. However, estimates suggest that only a subgroup of individuals with ADHD may be particularly vulnerable, highlighting a need to identify characteristics that may contribute to later cognitive decline. This analysis examined the incidence of dementia in older adults with and without ADHD, and whether two known risk factors for dementia—age, and a specific pattern of cognitive impairment, namely amnestic mild cognitive impairment (MCI)—are more strongly associated with dementia risk in older adults with ADHD than those without.

Methods: From the National Alzheimer's Coordinating Center (NACC) database, 161 participants with ADHD and 312 participants without ADHD—matched on sex, age, education, race/ethnicity, depression, cognition, and length of follow-up—were identified. Participants' cognitive status was classified by a clinician as 'normal,' 'MCI,' or 'demented' at each annual visit. A Cox proportional hazards regression model examined the risk of dementia over the follow-up period between participant groups, adjusting for age, sex, and education. Two generalized linear mixed effects models (GLMMs) determined predictors of incident dementia in each participant group. The first model quantified the interactive effect of ADHD*Age on dementia incidence, covarying for sex, education, and follow-up length as fixed effects. The second model quantified the interactive effect of ADHD*MCI subtypes (no MCI, amnestic MCI, and non-amnestic MCI) on incident dementia, covarying for sex, education, and follow-up length.

Results: Over the follow-up period (median 5.2 years, range 13.8 years), 18 (11.2%) participants in the ADHD group after compared to 27 (8.5%) in the non-ADHD group developed all-cause dementia, yet this difference was not statistically significant ($\chi2=0.867$, $p=.352$). In both groups, the most common cause of dementia at participants' last recorded visit was Alzheimer's disease (66.7% of dementia cases in both groups). The adjusted Cox proportional hazards model showed that age at baseline was a statistically significant predictor of the development of dementia over the follow-up period (Hazard ratio [HR]=1.08, 95% CI 1.03-1.13, $p<0.001$), while ADHD status was insignificant (HR=1.34, 95% CI 0.74-2.423, $p=.34$). In both GLMMs, the most robust predictor of incident dementia was age ($p<.007$). ADHD status and the interaction between ADHD status and age (first GLMM), as well as MCI subtype and the interaction of MCI subtype with ADHD status (second GLMM) were not significant.

Conclusion: Although adults with ADHD had a slightly increased rate of dementia compared to those without ADHD, there was no difference in prevalence of dementia. This may, however, be as a result of sampling bias in NACC, as incident dementia cases - especially those of the Alzheimer's disease type, consistent with the most common cause of dementia in this sample - are generally overrepresented. Results showed that age, which is understood to be the strongest predictor of dementia, was the only consistent prognostic factor. Therefore, more research is needed to understand the link between ADHD and dementia found in previous research.

"I Used to be a Storyteller": People with Primary Progressive Aphasia Share Their Perspectives on the Communication Needs for Themselves and Their Family Members

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Background/Objectives: Primary progressive aphasia (PPA) is characterized by insidious and progressive language impairment. Clinical guidance for this population recommends the continual involvement of speech-language pathologists for the provision of evidence-based speech and language therapies guided by person and family centred care (PCC). PCC ideally follows person and family member perceived needs to deliver tailored interventions. There is currently a lack of knowledge about the communication needs of people with PPA and their families. The research aims were to explore the communication needs pertaining to people with PPA and their family members from the perspectives of people with PPA.

Methods: This study used a qualitative description approach, underpinned by the pragmatic paradigm. The first author conducted semi-structured qualitative interviews with seven people with PPA, 6 males and 1 female. The participants were aged 63 to 80 years (m = 71; SD = 5.15) and were less than one month to 96 months post-diagnosis (m = 22; SD = 32). Maximum variation sampling was used to obtain variation in the sample in relation to the PPA variant. The interviewer, a registered speech-language pathologist, utilized supported conversation techniques for adults with aphasia to support the participants to participate in the interviews. Qualitative content analysis was used to reveal codes and categories related to the research objectives.

Results: Six categories of communication needs pertaining to people with PPA were revealed: Diagnosis and disclosure; Wanting information for self and the general public; General communication difficulties; Impact on communication in everyday life; Impact on psychosocial wellbeing; and Future planning. One category emerged pertaining to the communication needs of family members of people with PPA: Impact on family or others.

Conclusion: This study was unique in focusing explicitly on obtaining the perspective of people with PPA on their communication needs and in seeking their perspective on family communication needs and concerns. The investigation highlighted the breadth of the impact of the communication disability on the everyday functioning of people with PPA. The findings can be used to inform the development of communication interventions in the future.

Healthcare Providers' Perspectives on Using the Driving and Dementia Roadmap (DDR)

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Background/Objectives: Driving cessation poses considerable challenges for people with dementia, family/friend carers, as well as healthcare providers who lack training and knowledge about this topic. To address the gap in accessible resources to support affected individuals through this process, we developed a web-based resource/toolkit called the Driving and Dementia Roadmap (DDR) (www.drivinganddementia.ca). To ensure the sustainability and scale up of the DDR, publically launched in October 2022, we are exploring the DDR's acceptability, appropriateness and impact on how users approach and manage driving cessation. In this poster presentation, we report on early results of healthcare providers' perspectives of using the DDR.

Methods: Our on-going knowledge translation research activities, guided by the Knowledge-to-Action (KTA) framework, included conducting surveys about the DDR. All DDR users were invited to participate in a short (approximately 5 minutes) online survey via a pop-up message that appeared prior to exiting the site. Survey participants were directed to one of three surveys aimed at either people with dementia, family/friend carers or healthcare providers. In the healthcare provider survey, questions included participants' perceptions about knowledge gained, changes in confidence, as well as their satisfaction with the DDR. A descriptive summary of the survey responses was conducted via the REDCap platform.

Results: To date, 20 healthcare/service providers (6 nursing professionals, 6 occupational therapists, 3 geriatricians, 2 Alzheimer Society staff, 1 social worker and 2 non-disclosed) completed the survey. Most were women (95%) and had been practicing for over 10 years (80%) in 7 provinces. Interactions with patients/clients about driving cessation occurred frequently or very frequently (75%). As a result of using the DDR, over half of participants (55% - 80%) reported increased gains in "new knowledge" and "somewhat to much more confidence" in having conversations about and managing the emotional impact of stopping to drive, as well as providing support after driving cessation. The majority of participants (65% - 80%) indicated being "very satisfied" with all aspects of the DDR (i.e., usefulness, comprehensiveness, trustworthiness, presentation of information, ease of navigation, as well as meeting their knowledge needs). Participants provided positive comments about the DDR such as, “I love and need this resource”.

Conclusion: Early survey results indicate that the DDR is a highly acceptable and appropriate resource for healthcare providers, effectively meeting their knowledge needs in regards to driving cessation and dementia. In particular, the DDR can help healthcare providers have supportive conversations with their patients/clients that consider the emotional impact of driving cessation. Maintaining the therapeutic relationship is critical for ensuring shared-decision making about stopping to drive. Next steps will involve in-depth interviews with healthcare providers to further explore how they experience the DDR and its impact on their practice.

A Rapid Systematic Review Characterizing the Minimal Clinically Important Difference in Alzheimer’s Disease Clinical Trials: Preparing for the Era of Emerging Amyloid Immunotherapies

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Background/Objectives: Novel immunotherapies for early Alzheimer’s Disease (AD)-lecanemab, aducanumab, and donanemab--remove amyloid-beta from the brain and have been reported to slow the rate of cognitive decline by about 25-30% at 18 months. Subsequently, there has been debate regarding whether these statistically significant effects are clinically meaningful. To better appreciate the magnitude of the observed effects in AD immunotherapy trials, we are conducting a systematic review and meta-analysis of research articles that used anchor-based or distribution-based methods to derive a minimum clinically important difference (MCID) in AD outcome measures.

Methods: The systematic review protocol follows published guidance for rapid reviews. The protocol was published after pilot searches but before completing reviews for study eligibility (https://cumming.ucalgary.ca/labs/smith-research/review-of-differences-in-alzheimers-disease). Key inclusion criteria were that the study included only patients with dementia due to AD with an objective of determining the MCID or the minimum detectable difference (using anchor-based or distribution-based methodology) in any one of the following outcome measures: Mini-mental State Examination (MMSE); Clinical Dementia Rating scale sum of boxes (CDR-SB); Alzheimer’s Disease Cooperative Study Activities of Daily Living Scale (ADCS-ADL); the Alzheimer’s Disease Assessment Scale-Cognitive Subscale (ADAS-Cog), or integrated Alzheimer’s Disease Rating Scale (iADRS). EMBASE and MEDLINE/PubMED were searched from inception to June 4th 2023. Search terms included “Alzheimer Disease” AND (“minimal clinically important difference” OR “clinically meaningful difference” OR “meaningful change” OR “minimum detectable change”). Two reviewers independently screened titles, abstracts, and full text using Covidence®. Conflicts were resolved through consensus.

Results: The search was conducted on June 4, 2023, and retrieved 854 articles after de-duplication, of which 808 were excluded based on title and abstract and 35 after full text review (10 were abstracts, 13 had the wrong study design, 6 were review articles or letters to the editor, 6 were on outcomes other than the prespecified ones). After applying exclusions, 11 studies were eligible. The eligible studies reported clinically meaningful change metrics or thresholds on the MMSE (n=6), CDR-SB (n=2), ADAS-Cog (n=7), and iADRS (n=1), but there were no studies on the ADCS-ADL (n=0). Some studies reported that MCIDs varied by dementia severity and across timepoints. Data will be extracted using a standardized case report form.

Conclusion: Our systematic review identifies that there is existing literature on clinically meaningful differences for most of the outcome measures used in recent AD immunotherapy trials. By the time of the CCD in November we will have completed data extraction and synthesis. The results of this rapid systematic review will provide important clinical context for the outcome differences observed in light of the recent disease-modifying trials in AD.

Free Water Levels in Normal-Appearing White Matter Predict Vascular Lesion Progression in Individuals with Dementia

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Background/Objectives: Cerebral small vessel disease (SVD) is a common co-pathology in elderly and individuals with dementia. Neuroimaging markers of SVD include white matter hyperintensities (WMH) and MRI-visible perivascular spaces (PVS). However, the mechanisms underlying changes in these markers over time, whether ischemic or beta-amyloid (Aβ)-related, remain elusive. Here, we evaluated the effects of microstructural injury in the normal-appearing white matter and Aβ in the cerebral cortex on the progression of WMH and PVS over three years.

Methods: Data was obtained from two independent cohorts: (i) TRIAD, comprising cognitively normal, MCI, and AD dementia participants (baseline: N=199, follow-up year 1 and 2: N=102 and 62); and (ii) MITNEC-C6, comprising “real-world” patients with mixed dementia and moderate-to-severe WMH burden (baseline: N=52, 2 years follow-up: N=25). We quantified global WMH and PVS volumes from FLAIR and T1w MRI. At baseline, we examined associations between these volumes and diffusion MRI-derived free water. Longitudinally, we employed linear [mixed-effect] models to investigate the relation of WMH or PVS volume changes over time with baseline free water, using cortical Aβ-PET, age, sex, and APOE-ε4 as covariates.

Results: In TRIAD and MITNEC-C6 respectively, mean ages were 72±6 and 77±8 y, 60% and 42% were female, and 41% and 48% were Aβ-positive. At baseline, higher free water in normal-appearing white matter was associated with higher WMH volume (β_TRIAD=+0.34±0.06, P_TRIAD<0.001 and β_MITNEC=+0.31±0.14, P_MITNEC=0.03) as well as total PVS volume (β_TRIAD=+0.53±0.06, P_TRIAD<0.001 and β_MITNEC=+0.30±0.13, P_MITNEC=0.03). Longitudinally, faster WMH progression was predicted by higher baseline free water in normal-appearing white matter (P_TRIAD<0.001 and P_MITNEC=0.01) in Aβ-positive but not negative individuals. Conversely, higher free water in normal-appearing white matter was moderately related to slower PVS progression (P_TRIAD=0.03 and P_MITNEC=0.004).

Conclusion: Our findings support a key role for free water and Aβ in predicting the progression of volumetric MRI-based markers of SVD. Future investigations will explore the spatial relationships involved. Additionally, further validation of our longitudinal segmentation tools for PVS is necessary to support a potential link between free water and PVS temporal dynamics.

Factors Associated with Spouse Caregiver Burden in Older Adults with Mild Cognitive Impairment or Mild Dementia

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Background/Objectives: Factors associated with stress/burden in caregivers of people with dementia include poor insight, impaired executive functioning, and neuropsychiatric symptoms. Less is known about these factors in spouses of people with MCI, particularly with regard to patient cognitive functioning, and findings have been inconsistent. The present study hypothesized that patient neuropsychological functioning, insight, qualitative aspects of test behaviour, and spouse report of memory and behaviour disturbance would be associated with increased caregiving stress in a sample of couples in which one spouse was diagnosed with MCI or mild dementia.

Methods: Data were obtained from the Early Cognitive Change Clinic for Older Adults. ECCCOA provides neuropsychological assessment for patients referred due to suspected MCI. Patients' program partners are assessed for stress via clinical interview and questionnaires. Diagnosis is based on informant report of patient functioning, combined with neuropsychological assessment results. The present study included data for 81 patients with a diagnosis of MCI (n=35) or mild dementia (n=46) (based on ECCCOA assessment) and a co-habiting heterosexual spouse. Spouses completed the Zarit Burden Inventory (ZBI), Beck Depression Inventory-II (BDI-II), Depression Anxiety Stress Scale (DASS), Relationship Satisfaction Scale, and Revised Memory and Behavior Problem Checklist (MBPC). Spearman correlations between stress measures and neuropsychological test scores were examined. Selected items from the Geriatric Depression Scale were used to measure level of insight. Three qualitative aspects of observed patient behaviour (QOPB: comprehension difficulty, impulsivity, perseveration) were coded from the neuropsychological assessment report.

Results: Spouses of patients with mild dementia reported higher levels of caregiver burden compared to spouses of patients with MCI. Female spouses had higher BDI-II and DASS scores. There were no significant relationships (p<.01) between spouse self-report measures and insight index or QOPB. Neuropsychological test scores were not significantly associated with caregiver stress in the sample as whole or in the MCI subgroup. Frequency of patient memory and behavior problems (MBPC frequency) was strongly associated with spouse self-report of higher burden and depressive symptoms and lower relationship satisfaction. MBPC Depression and Behavior subscales also showed significant relationships with spouse self-report measures that differed between the MCI and dementia subgroups.

Conclusion: The present study highlights the importance of patient neuropsychiatric symptoms in the development of caregiver distress in spouses of older adults with MCI or mild dementia. More research is needed to develop and evaluate interventions for this population

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Launch of Clinical PET Amyloid in Ontario—Initial Experience

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Background/Objectives: Mild cognitive impairment (MCI) and dementia are common and growing in prevalence. The most common cause of MCI and dementia is Alzheimer's Disease (AD) but it is not the only cause. Misdiagnosis of AD is common when based on clinical symptoms alone. Biomarkers are available to support the diagnosis. Amyloid deposition in the brain can be detected using Position Emission Tomography (PET) for amyloid. This study describes the initial experience with the Ontario PET amyloid (F18-Florbetaben (Neuraceq) imaging registry in patients presenting to the Toronto Western Hospital (TWH) Memory clinic with cognitive impairment who had PET amyloid.

Methods: 36 patients who presented to the TWH Memory clinic with cognitive deficits where AD was a consideration and underwent PET amyloid are included in this study. The registry includes patients aged 50-85, diagnosis of MCI or dementia and MOCA ≥10. The registry was launched in February 2023 and includes 6 Ontario sites. The registry includes age, gender, level of education, living situation, racial group, primary diagnosis and current management. The patients are asked to rate general health and overall wellness. After PET amyloid is done, patient is informed about the results (negative amyloid burden, moderate amyloid, significant amyloid), diagnosis and further management plan. A 1-month follow-up is conducted to evaluate their reaction toward PET amyloid result. We present preliminary descriptive statistics using percentages for ordinal and factor variables, and median with interquartile range for continuous variables from one site.

Results: Patients' median (IQR) age was 71.00 [62.75, 77.25] and 22 (61.1%) were male. The pre-PET primary diagnosis was MCI in 21 (58.3%), and dementia in 15 (41.6%). The post-PET diagnosis was stratified according to amyloid deposition in the brain into 16 (44.4%) negative and 20 (55.5%) positive amyloid deposition. In the 20 PET amyloid positive patients, 8 patients had MCI and 12 had dementia. All patients with positive amyloid deposition had changes in their management plan whereas 6 (37.5%) patients in the negative amyloid group had a change in their management. The changes in the PET amyloid positive group included 11 patients starting and 5 continuing on AD treatment, and 4 being referred for clinical trials. One from the amyloid negative group stopped AD medication and 2 have undergone further investigations.

Conclusion: In the initial experience of the Ontario PET amyloid registry in 36 patients at one centre, a significant number had a change in their management. An early diagnosis of AD in MCI and dementia is essential for getting the right treatment to the right person at the right time. As disease-modifying therapies become available it will be critical to make the correct diagnosis at early stages in the disease. PET amyloid results will enable precision medicine so that patients and their families can make decisions regarding treatment and future planning.

Hippocampal Shape as a Biomarker for Disentangling Alzheimer's and Cerebral Small Vessel Disease Contributions in Mixed Dementia

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Background/Objectives: Alzheimer's disease (AD) and cerebral small vessel disease (SVD) are the two leading causes of dementia and co-occur in the vast majority of patients with dementia. Disease-specific biomarkers that capture the relative impact of AD and SVD pathologies on neurodegeneration and cognitive decline within individual patients are needed. An important point of convergence for both AD and SVD is hippocampal atrophy, a key substrate for memory decline impacted early and extensively in dementia. However, the effects of AD and SVD pathology on the pattern of hippocampal degeneration have not been explored.

Methods: We evaluated 69 participants from the Medical Imaging Trials Network of Canada Project C6 (MITNEC-C6), a unique multi-centre observational study designed to recruit cognitively impaired individuals with mixed AD and moderate-extensive SVD. Despite representing most patients in memory clinics, patients with significantly overlapping mixed AD/SVD dementia have been largely excluded from previous clinical trials for AD or SVD. Vascular burden was quantified on structural MRI as total and regional volume of white matter hyperintensities (WMH). β-amyloid (Aβ) was quantified by 18F-AV45-PET and interpreted as Aβ-positive or Aβ-negative by two dual certified nuclear medicine physicians/radiologists. Hippocampal volume was quantified with HippMapp3r, a novel deep learning hippocampal segmentation algorithm, validated in patients with extensive atrophy and cerebrovascular disease. Linear regression models were used to investigate the effects of WMH and Aβ on hippocampal volume. Hippocampal shape was subsequently analyzed with SPHARM-PDM. Analyses were adjusted for age, sex and education.

Results: Aβ-positive (N=27) or Aβ-negative (N=42) individuals were comparable in terms of global and regional WMH volumetrics, but Aβ-positive patients presented with smaller hippocampal volume, adjusted for age, sex and education (P=0.003). Greater frontal WMH (β=-0.225, P=0.045) and occipital WMH (β=-0.347, P=0.007) loads were predictive of smaller hippocampal volume independent of Aβ deposition (β=-0.201, P=0.033), indicating differential sensitivity of the hippocampus to SVD and AD pathologies. Analyses revealed no interaction between Aβ status and regional WMH in terms of their effects on hippocampal volume, suggesting additive but not synergistic effects on hippocampal atrophy. Consistent with this interpretation, hippocampal shape analysis revealed that Aβ status, frontal WMH and occipital WMH each had a spatially distinct rather than overlapping impact on the pattern of hippocampal degeneration.

Conclusion: Spatial analysis of hippocampal shape revealed novel interactions between commonly co-occurring pathologies that drive hippocampal neurodegeneration and cognitive decline in dementia. The pattern of hippocampal degeneration is differentially sensitive to the effects of SVD and AD in individuals with mixed dementia. Leveraging these distinct contributions, hippocampal shape has the potential to serve as a disease-specific biomarker, and thus inform clinical diagnosis and individualized treatment strategies for mixed dementia.

A Path Forward from Assessment to Activation: Consolidating Leisure Assessment Tools for People Living with Dementia

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Background/Objectives: Therapeutic Recreation (TR) is an evolving field within the Canadian healthcare landscape. While 32 Canadian Universities and Colleges offer a TR curriculum, there remains a lack of standardization across training and practice, including assessment tools. This has contributed to the difficulty in moving from professional associations to a regulatory college. Additionally, efforts to validate the profession through a biomedical lens have challenged the specialty’s intrinsic focus on psychosocial needs. Our objective was to consolidate and conduct a critical analysis of TR assessment tools currently used in Canada to inform the future development of standard-of-practice guidelines for individuals living with dementia.

Methods: Following the Registered Nurses’ Association of Ontario (RNAO) Best Practice Guideline methodology, we first conducted a literature search for existing reviews of standardized TR assessment tools. The search served to better understand the current state of practice in dementia assessment and define existing knowledge gaps. Subsequently, an environmental scan of existing leisure assessment tools was completed through Omni Catalogs, using the search terms “Leisure Assessment”, “Leisure Measurement”, “Dementia Activation”, “Leisure Exploration”, and “Evaluation Tools”. Additional sampling methods, including purposive referrals were used to collect assessment tools representative of current Canadian health care environments, spanning urban, rural, and remote practice settings. Each tool underwent in-depth thematic charting using the constant comparison method. Finally, two key informant interviews were conducted to cover gaps in the literature and identify novel strategies that are increasingly considered best-practice in the TR field for dementia care.

Results: The literature search resulted in only one manuscript (Buettner & Kolanowski, 2003), published 20 years ago, reviewing TR assessment plans and suggesting guidelines. The remaining papers described isolated studies evaluating small-sample activation trials, many of which reported similar findings that creating personalized intervention plans resulted in better outcomes. Through the environmental scan, we attained 24 leisure assessment tools from an array of healthcare settings (Hospital, Long-Term Care, Day Hospital/ Treatment Facilities, Private Practice, Retirement Homes) from Ontario (22), and across Canada (2). Overall, a high degree of variability was observed across domains assessed (e.g., whether significant relationships or accessibility needs were included) and administration format (e.g., type/number of response options). Most assessed current leisure interests (17), while fewer sought to understand hopes, aspirations and goals for the future (9) or comfort with new leisure experiences (2). One third (8) included only closed-ended questions, limiting opportunities for personalization.

Conclusion: Based on our results, we present a framework for developing a leisure assessment guideline for people living with dementia that consolidates assessment tools currently used across Canadian care settings. Themes that emerged from key stakeholder interviews were consistent with our environmental scan and literature search, highlighting the need for standardization within the TR field through developing evidence-based guidelines and tools that are both comprehensive and flexible, allowing for personalization of recreation plans. Our findings suggest opportunities to incorporate a narrative approach to understanding the individual’s future aspirations, hopes, and dreams in addition to past and present experiences.

Measurement of Cerebral Perfusion in Older Adults with Cognitive Impairment

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Background/Objectives: Alterations in cerebral blood flow (CBF) have been associated with increased risk of dementia in longitudinal studies. However, these studies employed Magnetic Resonance Imaging (MRI) technology with participants in a resting state. This form of measurement does not allow us to visualize the dynamic changes that occur in CBF during day- to- day activities, and furthermore they employ expensive techniques which are difficult to replicate in clinical practice. The objective of this study was to assess the feasibility of measuring CBF hemodynamics in cognitively impaired older adults during dynamic movements using mobile technologies

Methods: Eighty-eight older adults (37:51Female:Male; age: 75±7 years) visited the Parkwood Institute location in London, Ontario, to participate in the current study. All participants were grouped into 3 main groups as cognitively normal, mild cognitive impairment and cognitively impaired according to standardized criteria. Participants rested in the seated position and were instrumented with a portable transcranial Doppler ultrasound (TCD-X; Atys medical, Soucieu en Jarrest, France) device, and cerebral tissue near-infrared spectroscopy (NIRS; Artinis Medical Systems BV, Netherlands) device (figure 1A). The middle cerebral artery was insonated using a 2-MHz transducer on the right side of the head, and if the signal quality was inadequate or not acquired, the left side was insonated (n=14). The NIRS device was placed on the corresponding side of the TCD probe. All participants had CBF measured during a seated to stand transitions, single working memory tasks, and active walking with a dual task paradigm.

Results: Of the 88 participants, the NIRS signals were acquired in 81 (92%) of participants, middle cerebral velocity (MCAv) signal using TCD was ascertained in 67 (76%) of participants, continuous monitoring of blood pressure using finometry was collected in 81 (92%) of participants in the seated position. Full multi-modal signal acquisition of MCAv, NIRS, and BP was possible in 58 (66%) of participants in the seated position. During dual task walking 60 participants (71%) had MCAv data acquired using TCD. Combined MCAv and NIRS signal acquisition was possible in 56 (66%) of participants. Combined MCAv and NIRS signal acquisition was possible in 58 (67%) of participants. Of the 88 participants at study intake, participants who completed all protocol components with an adequate MCAv signal comprised of 13 (59%) of cognitively normal participants, 35 (70%) of mild cognitive impairment participants, and 10 (63%) of cognitively impaired participants.

Conclusion: Of the 88 participants at the study intake, 56 participants were able to complete all aspects of the study with full signal acquisition. A lower MCAv success rate was observed in females and those with cognitive impairment had the lowest MCAv signal acquisition. This study has provided valuable insights into the measurement of CBF during dynamic movements of tasks of daily living. It provides novel insights into the relationship between alterations in CBF during normal activities and its correlation with cognitive decline which are not possible using MRI technology alone.

Sex-Specific Variances in the Network Patterns of Risk Factors for Individuals With Cognitive Decline Compared to Healthy Controls

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Background/Objectives: The incidence of dementia in Canada is projected to almost double within 10 years, posing unique challenges to healthcare systems. Notably, 60% affected are female. Identifying both non-modifiable and modifiable risk factors (RF) is crucial, including sex-specific factors due to the higher prevalence among females. Here, we employed a network analysis to examine prominent RF in healthy controls compared to those with cognitive decline (CD), as well as the interrelationships of RF and how the interaction of RF alter dementia probability. Additionally, sex-specific networks were compared to identify unique RF and interactions present among RF between males and females.

Methods: Healthy controls and those with CD, including mild cognitive impairment and dementia were included from the Sunnybrook Dementia Study and the Ontario Neurodegenerative Research Initiative (n = 353 total, 53% female, 85% CD). Cerebral structural outcomes (e.g., perivascular spaces, white matter hyperintensities), non-modifiable RF (e.g., age, family history) and modifiable RF (e.g., hypertension, smoking status) were included in the network modeling. Sex-specific networks were created within the CD group and compared between the sexes. Moreover, a network of those with CD was compared to the healthy control network, for each sex separately. The ‘mgm’ package was employed in RStudio. The relationships among sets of RF present in CD were identified as well as the strength of these relationships. Nodes represented the individual symptoms associated with dementia and edges are the pairwise dependency between symptoms. Node centrality was investigated to determine the relative importance of each symptom within the network.

Results: There were no differences between the networks of males and females in those with CD ($p > 0.05$). When examining within each sex, dependent upon cognitive status, in females it was revealed that the healthy controls compared to those with CD had statistically different connectivity between their networks ($p = 0.000$), driven by relationships among cognitive outcomes, as well as deep white matter hyperintensities and periventricular white matter hyperintensities. In males, the healthy controls and individuals with CD also had a statistically different connectivity within each of their networks ($p = 0.004$). Further analysis revealed that this was due to relationships present in CD among the imaging outcomes, and with hypertension, hyperlipidemia and smoking status in relation to the cognitive domains and imaging outcomes. For both sexes within the individuals with CD, compared to healthy controls, their networks had greater interconnectedness among RF.

Conclusion: Our findings reveal discernable variations in network patterns of RF for CD, particularly related to sex-specific disparities. Though sex-specific networks within the CD group were not statistically significant between the sexes, the nodes and interconnectedness within each network exhibited distinct characteristics, underscoring the need for future investigations with larger sample sizes to enhance statistical power. The distinct sex-differences of RF for dementia are further underscored when comparing within sex to their healthy counterparts. The observed differences in RF within sexes emphasizes the necessity of employing sex-specific statistics, transcending the conventional use of sex as a covariate, particularly for CD.

Equipping Acute Care Teams Within an Evolving Healthcare Landscape: A Behavioural Supports Capacity Building Package

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Background/Objectives: The Behavioural Supports in Acute Care: Current Practices and Opportunities for Growth Survey Report (Behavioural Supports Ontario Acute Care Collaborative, 2021) highlighted the need for additional behavioural health capacity building in Ontario's acute care hospitals. In response, the Behavioural Supports Ontario (BSO) Acute Care Collaborative committed to developing a capacity building package that reinforced person, family and relationship-centred care while providing foundational knowledge and practical skills in the provision of quality care to older adults with, or at risk of, responsive behaviours associated with dementia, mental health, substance use and/or other neurological conditions.

Methods: Guided by the Knowledge to Practice Process Framework (Ryan et al., 2013), the Collaborative developed knowledge transfer and translation tools to be used by behavioural support champions and educators within acute care who can further support implementation. Three key themes were identified: (1) the importance of personhood, (2) all behaviour has meaning, and (3) your approach matters. A commissioned artist illustrated a fictional patient to elicit empathy through a human story. This fictional patient was used throughout the resource package to create a relatable case study.

Results: In 2022, a capacity building package was made publically available in both official languages, and included three posters and three presentation slide decks for short education sessions. Posters allowed for a visual representation of evidenced informed practices, while the slide decks with scripted facilitation notes built upon key messages in the posters and prompted reflective practice along with practical application strategies. Brief surveys using QR codes were used as a feedback mechanism to evaluate the applicability and impact of the educational resources. Preliminary feedback collected (June 2022 - April 2023) on the poster (n=71) and mini education sessions (n=91) showed learners found these resources useful. On a 5 point Likert scale (1= No, not useful to 5= Yes, very useful) the poster mean was 4.2, while the mini education mean was 4.5. Collected qualitative data demonstrated mini education participants' learned care strategies and planned application to their practice.

Conclusion: This novel capacity building package provides acute care educators accessible and easy-to-use knowledge transfer and translation tools. The package uses a humanistic approach in engaging acute care team members to enhance the delivery of person, family and relationship-centred care and provides learners with practical strategies in the care of older adults experiencing responsive behaviours.

Dementia Behavioural Support Resource to GEM in the Emergency Department

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Background/Objectives: Among people living with dementia (PLWD), behavioural symptoms and caregiver burnout are leading factors contributing to Emergency Department (ED) visits. Care in the ED is largely focused on acute presenting problems. Assessing cognition and addressing symptoms of dementia can be challenging in this fast paced and noisy environment without a specialized approach. This can lead to increased hospital admissions and early long-term care placement for PLWD. Providing specialized care to PLWD and their caregivers in the ED can improve the patient's ability to cope at home and manage behaviours to divert admission to hospital and prevent further ED visits.

Methods: This quality improvement project explored the impact of adding an experienced in-patient Dementia Behavioral Support Nurse (DBSN) as a specialized resource to the Geriatric Emergency Management (GEM) Team and larger ED healthcare team. Those patients with suspected or diagnosed dementia who were referred to the GEM Team were directed to the DBSN for assessment. Additional patients were identified through case finding. This specially trained nurse assessed the patient and caregiver needs and worked collaboratively with the GEM nurse, and the rest of the ED healthcare team to provide a care plan to support a sustainable discharge. Education, emotional support, follow-up with specialized geriatric services, and links to community services such as the Dementia Society were provided to reduce ED visits and prevent hospitalization of PLWD whose care could be managed effectively at home.

Results: Over the course of 9 weeks the DBSN served 44 patients as well as their caregivers. The nurse worked Monday to Friday and saw an average of one patient per day. Of those 44 patients, 29 were successfully discharged from the ED. Although two of the patients returned to the ED within 30 days, the presenting complaint was unrelated to dementia or behavioural concerns. The main reasons for referral to the DBSN were for mood and anxiety, cognition and dementia, behaviours, confusion, and sleep disturbance. The main interventions implemented by the DBSN included care plan development, medication suggestions, caregiver education, staff education, and patient education. When patients and caregivers were asked "what matters most" to them, the most common response was to return home and reduce their behavioural and psychiatric symptoms. Survey results from ED staff revealed an overall rating of their experience with the DBSN at 4.6/5.

Conclusion: The lack of community supports for PLWD needs to be addressed prior to admission to hospital to prevent decline in health status and unnecessary healthcare spending. Patient centered care, caregiver education and adequate outpatient services need to be arranged to improve the care of PLWD and reduce the strain and costs of the healthcare system. Providing specialized support to PLWD and their caregivers in the ED has the potential to improve their ability to cope at home and manage behaviours to divert admission to hospital and prevent further ED visits.

Postmortem Co-Pathologies of Mild Behavioral Impairment in Dementia-Free Older Persons

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Background/Objectives: Alzheimer disease (AD) is the most common cause of dementia, with neuropathological assessment serving as the gold-standard for identification. Whether neuropsychiatric symptoms (NPS) in advance of dementia are associated with AD, and/or other co-pathologies is of great interest. The criteria for mild behavioral impairment (MBI) select a subset of persons for later-life emergent and persistent NPS, representing a higher-risk group for incident cognitive decline and dementia. Here, in dementia-free older adults, we examined whether AD, Lewy body (LB), and/or transactive response DNA-binding protein 43 (TDP-43) pathology was associated with a greater likelihood of MBI up to five years before death.

Methods: Dementia-free National Alzheimer's Coordinating Center study autopsy participants (n=1016) were included in the analyses. Using the Neuropsychiatric Inventory-Questionnaire, MBI+ status required NPS to be present at >2/3 of study visits, otherwise status was set as NPSnotMBI if NPS failed to meet MBI criteria, or noNPS if NPS were absent. The presence of AD neuropathological change, LBD, and TDP-43 were determined using the National Institute on Aging-Alzheimer's Association guidelines. A multinomial logistic regression modeled the association between each pathology (predictor) and NPS status determined approximately five years before death (outcome). Cox proportional hazards regressions were used to determine the associations between NPS status and AD-dementia, as well as the interaction between MBI and cognitive status with the same outcome. All models adjusted for age, sex, education, cognitive status, time to death, and ApoE carrier status.

Results: Participants were at baseline a mean 82.6 years of age, 48.7% female, and 60% cognitively normal. At autopsy, 51.4% were AD+, 27.5% were LB+, and 17.7% were TDP-43+. Among AD+ individuals, LB or TDP-43 co-pathology was not associated with NPS status. Among MBI+ progressors to dementia (n=137), 43.8% were solely AD+ and 32.8% were mixed AD+/LB+. In NPSnotMBI progressors (n=118), 33.1% were AD+ whereas 42.4% were AD+/LB+. The multinomial regression showed AD+ individuals were 88.4% more likely to be MBI+ at baseline than AD- individuals (odds ratio (OR):1.88, 95% confidence interval (CI):1.29-2.75,p<0.01), with no group difference for NPSnoMBI (OR:1.22,CI:0.90-1.66,p=0.20). No significant associations were seen for LB pathology. In the survival analysis, MBI+ individuals progressed 2.03-fold faster to AD-related dementia than noNPS (CI: 1.60-2.57,p<0.01). Progression rates to dementia were higher in MCI, but the effect of MBI on progression was greater in NC (HR:3.05,CI:1.37-6.80,p<0.01) vs. MCI (HR:1.93,CI:1.51-2.47,p<0.01).

Conclusion: These findings suggest that those with autopsy-confirmed AD pathology-but not other common proteinopathies-are more likely to have MBI up to five years before death. By extension to postmortem diagnosis, these results reinforce the utility of MBI in AD-related dementia prognostication, even in cognitively normal individuals, in whom the later-life emergence of neuropsychiatric symptoms rarely triggers a dementia workup, let alone consideration of AD. Inclusion of MBI in research and clinical criteria for dementia could aid in identification of early stages of neurodegenerative disease, which may be helpful for selecting patients for treatment with AD disease-modifying drugs.

A Look into Direct-to-Home Teledementia Care Since the COVID-19 Pandemic

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Background/Objectives: Dementia prevalence is rapidly increasing worldwide. The COVID-19 pandemic catalyzed a digital revolution in dementia care. With the unprecedented adoption of virtual care, clinicians may need better guidance to ensure remote delivery of quality care. We aimed to review the literature to determine what we have learned so far on teledementia care since the onset of the COVID-19 pandemic.

Methods: We searched MEDLINE for literature published from March 2020 until March 2023. We included papers that involved videoconferencing as their direct-to-home virtual care method to evaluate patients suspected with any type and severity of dementia. We excluded protocols, case reports/series, books or book chapters, publications, telerehabilitation, and papers not written in English and without available full text.

Results: Direct-to-home teledementia has evidence in initiating and managing medications, connecting patients/families with relevant services, discussing home safety and long-term care planning, determining investigations needed, and reassessing cognitive and functional declines. It can be performed reliably and is acceptable to patients and care partners, providing them support, access, education, and empowerment. It is a valid tool to triage patients with frontotemporal dementia and increase practice outreach & clinical efficiency. For instance, the Virtual Behavioral Medicine program serves as a novel and game-changing virtual neurobehavioral unit for treatment of neuropsychiatric symptoms in dementia. However, teledementia remains to have relatively limited evidence on efficacy and safety, and its current practice lacks further expert guidance. There are persistent concerns related to logistical, technical, data privacy, safety, diversity, equity, and ethical issues, as well as lack of clinician training and standardization of telemedicine regulations.

Conclusion: Although remote assessments are unlikely to fully replace in-person visits, they can supplement current care models and expand access to neurologic care. Virtual assessment should always be individualized, converging data across the history, cognitive tests, and neurologic exam to arrive at a sound clinical impression. Sharing of best practices in the field can help guide clinicians adopt a more practical, efficient, and sustainable approach to teledementia care in the future.

Unique Biological Pathways Associated with Functional Gradients in the AD Continuum

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Background/Objectives: Integrating neuroimaging with spatially extensive gene expression data from the Allen Human Brain Atlas (AHBA) has shown that regional transcriptomic profiles follow the connectomic architecture in the brain. This imaging-transcriptomic approach could probe how the relationship between the spatial distribution of gene expressions and neuroimaging phenotypes may be linked to biological/molecular pathways. Here, we applied a nonlinear dimensionality reduction, generating connectome gradients, to compare differences in functional and structural connectomes in the AD continuum. Then, we associated group differences in connectome gradients to the AHBA data, to elucidate possible biological/molecular pathways related to the neuroimaging phenotypes.

Methods: 197 participants from TRIAD underwent resting state fMRI (rs-fMRI) and multi-shell DWI (dMRI) scans. The brain was parcellated into 1631 uniformly divided DKT-based ROIs using a novel high-resolution atlas. We then applied diffusion embedding dimensionality reduction to create functional or structural gradient maps followed by averaging subject-specific connectomes to generate structural and functional 'template' connectomes. Both functional and structural gradient maps were compared between the amyloid-beta negative (A-) compared to the A+ group. Differences in the gradient connectivity maps were associated with the AHBA via a Partial least squares (PLS) analysis, to identify a set of spatial transcriptomic profiles related to the group-wise contrast maps (t-statistics). Finally, gene set enrichment analyses (based on Gene Ontology databases) were conducted to highlight specific molecular/biological processes and cellular components associated with transcriptomic profiles.

Results: We found significant differences in both functional and structural gradients in transmodal regions/networks (DMN) between A- and A+ groups. Only the group-wise differences in the functional gradients (components 1-4) were significantly associated with the spatial distribution of transcriptomic profiles; explaining 72.8% (11330 genes) in variance within the 1st PLS component ($p < 0.01$). The subsequent gene enrichment analyses showed synaptic signalling and processes as potential underlying biological pathways behind the differences in functional gradients between A- and A+ groups. Future work will investigate gradient-specific/component-specific associations with transcriptomic data.

Conclusion: Imaging-transcriptomic analyses showed unique sets of transcriptomic profiles associated with differences in the functional gradients rather than structural gradient differences between A- and A+ groups in the AD continuum. The spatial profile of transcriptomic expressions was significantly associated with these functional gradient differences, highlighting dysfunctional synaptic processes as potential biological drivers explaining in vivo functional connectivity changes in A+ patients.