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Remote Care Monitoring for Dementia: A Knowledge to Practice Guide for Healthcare Providers

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Background: Dementia poses physical, psychological, social, and economic challenges for persons living with dementia (PLWD) and their caregivers. The responsive behaviors associated with this disease often lead to significant distress, emergency interventions, and increased healthcare costs. Remote care monitoring (RCM) devices enable caregivers and healthcare providers to manage acute and chronic conditions from within the home, where care cost are lowered and reflective of client preference for aging in place. Implementing RCM for PLWD may mitigate safety risks, reduce reliance on emergency services, and enhance health outcomes for both clients and caregivers.

Objective: This study sought to assess the application of RCM devices in supporting PLWD in the community, while evaluating the devices' utility and effectiveness on behaviour management, caregiver stress, crisis prevention, and overall satisfaction among care providers. Insights from this evaluation were then used to develop a Knowledge to Practice (KTP) guide, equipping care providers with evidence-based strategies for integrating these devices into routine practice, optimizing their use in real-world clinical settings to improve patient outcomes.

Methods: A mixed-methods approach was used to evaluate the impact of the RCM devices. Data was gathered through feedback surveys, interviews, and focus groups with caregivers and healthcare providers. Quantitative data was analyzed using descriptive statistics performed in SPSS, while qualitative data was systematically coded and categorized into themes based on observed patterns. Emergent themes were identified through iterative analysis, with inter-rater reliability ensured by dual review.

Results: Healthcare providers and caregivers reported positive impacts from RCM devices, highlighting their usefulness in managing safety for PLWD, with high satisfaction ratings. The findings suggest that when used successfully, RCM devices may enhance safety conditions to support individuals aging at home, reduce the need for emergency interventions or hospital admissions, and improve the wellbeing of both clients and caregivers.

Conclusion: The study highlights how RCM devices can enhance dementia care by promoting independence and early intervention, and reducing health and safety barriers to PLWD aging at home. The findings enabled the development of an RCM KTP guide that promotes success through comprehensive application strategies.

Meaningful Engagement Resource Guide: Evidence-Based Activities for Older Adults

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Background/Objectives: Behavioural Supports Ontario (BSO) provides behavioural health care services for older adults in Ontario with, or at risk of, responsive behaviours/personal expressions associated with dementia, complex mental health, substance use and/or other neurological conditions. Engagement in meaningful activities is essential for

promoting well-being, particularly for those experiencing cognitive or physical concerns. Research consistently shows that boredom and loneliness significantly contribute to responsive behaviours and personal expressions, often reflecting unmet emotional, social, and psychological needs. Social isolation, loneliness, and lack of cognitive stimulation have been linked to a higher risk of depression, anxiety, and cognitive decline, leading to feelings of helplessness and diminished quality of life. Meaningful, person-centred activities can help alleviate these concerns, reduce responsive behaviours by fulfilling emotional and psychological needs, and enhance overall well-being.

The *Meaningful Engagement Resource Guide: Evidence-based activities for older adults* aims to provide health care team members, family care partners, and other caregivers with a practical, person-centred resource to facilitate meaningful activities. By tailoring engagement to an individual's preferences, abilities, and life history, this guide supports a sense of purpose, connection, and joy, ultimately improving quality of life for older adults and reducing stress for caregivers. Additionally, the guide aligns with acute care initiatives to minimize the use of chemical and physical restraints by addressing the contributing factors of responsive behaviours.

Methods/Overview: This resource guide is designed as a structured yet adaptable tool for caregivers to implement personalized engagement strategies. It is grounded in best practices for person-centred care, incorporating principles of inclusivity, cultural competence, and sensory-based engagement. Key components of the guide include:

1. **My Personhood Summary©** - A foundational tool that captures an individual's life story, values, preferences, and interests, ensuring engagement activities are meaningful and relevant.
2. **Five Senses Framework** - A structured approach to tailoring activities by considering sensory preferences and limitations, including vision, auditory, touch, smell, and taste.
3. **Activity Selection and Adaptation** - A curated list of activities with step-by-step instructions, required materials, and suggested adaptations to accommodate various cognitive and physical abilities.
4. **Implementation and Evaluation** - Guidance on monitoring individual responses to activities, adjusting approaches as needed, and engaging interdisciplinary teams for additional support.

Results: The *Meaningful Engagement Resource Guide* is newly launched in Spring 2025. Anticipated outcomes include:

- Increased engagement, social interaction, and rapport building.
- Reduction in responsive behaviours by fulfilling emotional, social, and psychological needs.
- Improved mood, cognitive function, and overall quality of life.
- Enhanced well-being and reduced stress for formal and informal care partners.
- Decreased reliance on chemical and physical restraints in care environments by providing meaningful alternatives.

Conclusion: By offering evidence-based, person-centred engagement strategies, the *Meaningful Engagement Resource Guide* serves as a valuable tool for caregivers seeking to enhance well-being for older adults. Its emphasis on personal preferences, sensory considerations, and culturally competent care ensures that engagement is not only meaningful but also inclusive and respectful of each individual's unique identity. As development continues, further evaluation and feedback will refine the guide's effectiveness in supporting compassionate, person-centred care environments.

Brain Health Promotion with Métis Communities in Alberta

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Background/Objectives: Ensuring brain health promotion materials are culturally relevant is an urgent priority in Canada because Indigenous populations experience a higher prevalence of dementia than non-Indigenous populations. Brain Health PRO is a web-based educational program designed to increase knowledge around dementia and support individuals to make lifestyle changes to reduce the risk of dementia. The purpose of this project was to develop understanding about how Brain Health PRO can be adapted to a Métis context in the province of Alberta, Canada.

Methods/Overview: Métis participants were recruited across Alberta and interviews completed using the Métis visiting methodology (Keeoukaywin). Data was co-analysed using Indigenous approaches to thematic qualitative analysis. Our ethical approach integrated knowledge translation into the development of brain health promotion material so that research outcomes are directly applicable and useful to Métis communities in Alberta.

Results: Between April and November 2024, we conducted a total of 63 interviews with 20 participants to understand the cultural relevance of each of the seven components of Brain Health PRO: physical health, cognitive engagement, nutrition, sleep, social and psychological health, vascular health, and vision and hearing. The analysis generated two main themes which suggest the components of Brain Health PRO are not culturally relevant for Métis communities in Alberta. The first theme was "Promoting Métis knowledge systems" where participants shared that western ways of understanding brain health promotion in the Brain Health PRO content and delivery excluded traditional Métis knowledge. The second theme was "Holistic approaches to risk reduction" where participants described the possibility for Métis knowledge

to influence how each component is presented and how they could be understood together in a Métis worldview.

Conclusion: Though the seven components of Brain Health PRO may be useful and appropriate for Métis people, the way these concepts are presented and delivered needs to be informed by Métis people. In-person engagement with Métis communities is crucial to co-develop resources that are culturally appropriate; therefore, the next step is to have Métis communities inform, design, and develop culturally relevant health promotion materials themselves. This work will help to facilitate spread, scale and adaption to other Métis contexts. Additionally, the principles and methodology may be applied internationally to develop locally driven and culturally specific dementia care intervention for Indigenous populations.

Environmental Inputs into Cognition: Proposing a Hypothesis

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Background: As populations grow older, preserving cognitive health has emerged as a vital public health concern because of its costly significance for independent living. Cognitive health of older adults is influenced by a complex combination of personal and environmental factors, highlighting the intricate nature of cognitive aging. Recognizing the important environmental features that affect cognitive health can aid families in making educated choices about housing for their elderly relatives and help communities prepare for an aging population. This research seeks to identify particular aspects of the built environment are linked to cognitive health.

Objectives: This study aims to identify environmental factors that are associated with self-reported cognitive ability.

Methods: A secondary analysis of a cross-sectional study was conducted using survey responses from 1,612 older adults (65+ years) from Canada, the UK, the USA, and the Netherlands. The survey covered self-reported cognitive ability, and environmental factors. These factors were drawn from those used in other activity-focused research involving older persons and were grouped as three environmental indices namely; services (n=8; stores, banks, pharmacies etc.), resources (n=10; libraries, community/cultural centers, parks etc.), and neighbourhood agreeableness factors (n=4). Logistic regression was used to regress cognitive ability on the three environmental indices considering age, sex, and country/language segment, and their interactions.

The outcome was measured using the short-form (7 items; range 0 to 14) of the Communicating Cognitive Concerns Questionnaire (C3Q), which assesses the frequency of memory and attention lapses.

Analysis: Logistic regression was used to identify environmental factors of cognitive ability, using the lowest quartile of the C3Q distribution as the cut-point.

Results: The mean age of 1612 participants was 71 years (SD: 5.2) years. The average score on the short-C3Q was 11.8 (SD: 3.0; range 0 to 14). The range of scores for those categorized as low (n=401) was 0 to 10 and ≥ 11 for those categorized as high (n=1211). Only resources (bike paths) and neighbourhood agreeableness (safety walk) had important impact on cognitive ability. The model showed moderate prediction (c=0.535 for only resources index and c=0.550 for all the three environmental indices).

In terms of environmental resources, the percentage of individuals with lower cognitive levels was significantly smaller in the low cognition group, while the percentage of those with higher cognitive levels was notably greater in the high cognition group.

Discussion: This model identified only "bike paths" as an important factor in contributing to low cognition. The predictive accuracy of this model (c-statistic) was 0.54. This could be because access to bike paths provides opportunities for social interactions, exposure to nature and mental stimulation, probably acting as a reminder to good ole days when the participants were young and agile bikers.

Conclusions: This study suggests that living in a pleasant neighbourhood with bike paths are important for improving cognitive ability. Communities that prioritize and provide this will promote cognitive ability for their older citizens. These are novel associations and warrant further investigation using a longitudinal design.

How Well is Messaging About the Importance of Vaccination for People Living with Dementia Being Communicated? A Jurisdictional Scan of National Immunization Technical Advisory Groups and Dementia Advocacy Organizations

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Background: Vaccination is particularly important for people living with dementia (PLWD), who are at risk for meaningful declines in function and cognition following acute illnesses including vaccine-preventable infections. Even so, vaccine uptake remains suboptimal. Optimal tailoring of messaging relies on awareness in advisory, decision-making and advocacy settings that PLWD are an important population for immunization. We aimed to investigate steps along the way in immunization advisory - decision making - advocacy pathways to determine whether this messaging is being communicated to policy and public-facing audiences.

Methods: A jurisdictional scan conduced in January 2025 investigated three questions: 1) the inclusion of geriatrics expertise in a sample of eight National Immunization Technical Advisory Groups (NITAGs), 2) whether PLWD

are included in high-risk groups particularly recommended to receive adult vaccinations, and 3) whether dementia advocacy organizations from these same jurisdictions discuss and specifically recommend vaccination as part of messaging on living well with dementia.

1. Lists of NITAG voting members were reviewed, including institutional affiliations/biographies, in the following countries:Canada, USA, United Kingdom, Australia, Germany, France, Switzerland, and for the World Health Organization.
2. Published recommendations from the eight NITAGs were reviewed for five adult vaccines (COVID-19, influenza, pneumococcal, RSV and Herpes Zoster) to determine whether dementia or related conditions specifically appeared on lists of people for whom vaccination is particularly recommended or whether universal age-based recommendations would likely include most people living with dementia.
3. Websites for dementia advocacy organizations in each of the seven countries were searched for information relating to vaccines, and any specific recommendation on the importance of vaccination for PLWD. This included browsing the sites with particular attention to pages giving advice for reducing risk and living well with dementia, and searching the sites for the terms vaccine, immunization, "should I get vaccinated", influenza, COVID-19, pneumococcal, shingles, and zoster.

Results:

1. Four of the eight NITAGs (Canada, USA, France, Germany) included a geriatrician voting member.
2. All jurisdictions had variations on age-based recommendations for adult vaccines (e.g., recommending everyone over a certain age should be vaccinated). Some included specific mention of dementia as a high-risk condition (e.g., UK, Germany, and France for COVID, Canada for RSV), and several included chronic neurological conditions (sometimes with Central Nervous System or neurodegenerative as descriptors).
3. All but one of the dementia advocacy organizations made some mention of COVID vaccines. Only the USA and UK organizations mentioned any non-COVID vaccine, with the Alzheimer Society UK recommending influenza vaccine and the US Alzheimer Association linking to news stories describing research studies showing that influenza and pneumococcal vaccines may prevent dementia. None discussed vaccination as a specific recommendation for living well with dementia.

Conclusion: Although geriatrics representation is increasingly part of NITAGs, and PLWD are generally included in age-based recommendations and sometimes included among high-risk groups specifically recommended to receive vaccination, translation into public health and dementia advocacy organization messaging remains suboptimal. This represents a missed opportunity and an area for improvement given the benefits of vaccination for PLWD.

Multimodal ML for Stage-Wise Modeling of Alzheimer's Disease

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Background: Alzheimer's disease (AD), which affects more than 50 million people worldwide, is a progressive neurodegenerative disease and the most frequent cause of dementia. With an aging global population, this figure is projected to increase significantly in the coming decades. Although many studies have explored AD diagnosis and progression, most clinical instruments remain reactive, detecting the disease only after significant cognitive decline has occurred. Although machine learning has increasingly been applied to dementia prediction, most studies rely on single data sources or dual-modal integration, often overlooking subtle but significant early indicators of AD.

This study introduces a novel, clinically interpretable, multimodal machine learning framework that integrates four distinct and complementary data types, a combination not previously unified in AD progression modeling. Our aim was to capture stage-wise patterns of Alzheimer's progression using neuroimaging, cerebrospinal fluid (CSF) biomarkers, behavioral data from the NPI sleep disturbance module, and linguistic characteristics.

Method: We utilized four publicly available datasets: structural MRI scans from the OASIS dataset, CSF biomarkers (PTAU and ABETA42) from the ADNI-UPEN dataset, neuropsychiatric symptoms profiles from the NPI sleep disturbance module, and linguistic data from the ADNI Language subset. Each modality was modeled using a domain-specific machine learning algorithm.

Convolutional neural networks (CNN) were used to identify anatomical changes in magnetic resonance imaging. Random Forest classifiers captured biochemical shifts in CSF markers. Support Vector Machines (SVMs) analyzed linguistic complexity, fluency, and instruction-following capacity. XGBoost models detected behavioral changes related to sleep disturbances, such as nocturnal awakenings and irregularities of circadian rhythm. Patients were stratified into four clinically meaningful stages: non-demented, very mild, mild, and moderate.

Result: Each model exhibited clinically consistent stage-specific progression signals. Magnetic resonance imaging revealed structural brain changes aligned with the severity of neurodegeneration typical of AD. CSF biomarkers showed that the increase in the PTAU:ABETA42 ratios was correlated with the progression of the disease. Language markers were

especially sensitive to early cognitive impairment, capturing verbal decline before clinical symptoms appeared. Sleep behavior traits demonstrated a progressive reduction in continuity and circadian stability as patients advanced from mild to moderate stages. Although previous research has examined subsets of these modalities, this study is among the first to systematically integrate all four types of patient data, providing a holistic view of the parallel evolution of symptoms throughout Alzheimer's disease progression.

Conclusion: This multimodal architecture offers a scalable, pragmatic pathway for the early and accurate diagnosis of Alzheimer's disease. Stage-wise analysis in the biological and behavioral domains reinforces the clinical utility of our system. With the goal of enabling personalized interventions and improving the quality of dementia care, future work will focus on integrating these independently trained models into a unified system for real-time stage prediction and monitoring.

The Implication of Pharmacists in Family Medicine Groups Seems to have a Beneficial Effect on Medication Use Among Older Adults Living with Neurocognitive Disorders

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Introduction: The Quebec Health Ministry's Plan on Alzheimer's Disease and Related Disorders (ADRD) recommends to involve pharmacists working in Family Medicine Groups (FMG) in the care pathway of older adults living with ADRD to optimize their pharmacotherapy and health outcomes.

Objective: To evaluate the effect of FMG pharmacists' involvement in this pathway on the medication of older adults being investigated for, or recently diagnosed with ADRD.

Methods: We conducted a quasi-experimental study with nine FMGs involving a pharmacist for six months in the ADRD pathway (intervention group; n = 177 older adults) and three FMGs not involving pharmacists (control group; n = 22 individuals). Sociodemographic (age, sex), clinical (cognitive test), and medication data from older adults who agreed to participate were collected at study beginning (T0) and after six months (T6). Primary outcomes were the mean number of medications and potentially inappropriate medications (PIMs) according to the Beers criteria. Preliminary analyses compared crude differences-in-differences (DIDs) between the two groups, between pre-intervention (T0) and post-intervention (T6). DIDs and their 95% confidence intervals (95% CIs) were obtained using generalized estimating equations.

Results: At recruitment, compared to the control group, the intervention group had a higher mean age (80 ± 7.73 years vs. 78 ± 6.18 years), lower cognition (mean score = 24.5 ± 7.73 vs. 26.3 ± 2.11), a higher number of medications (10.5 ± 4.7 vs. 9.8 ± 5.4) and a lower number of PIMs (0.56 ± 0.88 vs. 0.81 ± 0.87). After six months, the intervention group had a greater reduction in the number of medications (DD: -0.41; 95% CI: -1.97; 1.37) and the number of PIM (DD: -0.01; 95% CI: -0.17; 0.15) than the control group, although these changes were not statistically significant.

Conclusion: These preliminary results seem to indicate a trend towards a greater decrease in the number of medications and the number of PIMs after a pharmacist's involvement in the ADRD pathway of participating FMGs. Additional analyses on a larger sample size will soon allow to account for potential confounding factors.

Barriers and Facilitators to the Integration of Registered Dietitians in Rural Primary Healthcare Memory Clinics

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Background/Objectives: Eating and drinking is often affected in individuals living with dementia, which can compromise nutrition status and increase risk for malnutrition. However, malnutrition screening is not routinely performed in community and primary care. Non-dietetic health professionals report limited nutrition knowledge, and individuals living with dementia do not always receive dietitian referrals despite an increased risk for nutritional decline. Although registered dietitians have an important role in nutrition care and prevention of malnutrition, they are not always included in interprofessional teams. Few studies have explored dietitian involvement in dementia care within the community or examined how other healthcare professionals manage nutrition issues without dietitian support. Therefore, this study aims to understand facilitators and barriers to dietitian involvement in interprofessional rural primary care memory clinics where nutrition care is provided to patients.

Methods/Overview: A qualitative descriptive design was used. In June-July 2024, six focus groups were conducted with individuals located in southern Saskatchewan: three

with rural memory clinic teams, one with primary health care managers and facilitators responsible for overseeing memory clinics, and two with Registered Dietitians. All focus groups were conducted by telephone and audio-recorded. Focus group guides were informed by clinical expertise and experience with memory clinic teams, with several topic areas to facilitate discussion. Data were analyzed using six-step reflexive thematic analysis.

Results: Twenty-three individuals participated in the focus groups. Four themes were developed that encompass barriers and facilitators to dietitian involvement in rural memory clinics: *It's a matter of perspective*, *We are on the same team*, *What does rural have to do with it*, and *Structure is the key to success*. The main barriers to dietitian involvement included low understanding among teams of the dietitian role and need for involvement, teams not referring to dietitians, teams' perceived ability to handle nutrition issues without a dietitian, demanding workloads of dietitians in rural positions, dietitian turnover, and the need for structure to support dietitian involvement. The main facilitators included improved understanding among teams of the dietitian role and importance of nutrition care, teams' enthusiasm for collaboration and interprofessional approach to care, dietitians feeling equipped to provide nutrition care for those living with dementia, teams accepting dietitians as team members, prior relationships between team members and dietitians, and recently added processes to include dietitians.

Conclusion: Dietitian involvement in interprofessional rural primary care memory clinics was influenced by several barriers and facilitators. Barriers specific to the rural location of the clinics and limited structures hindered dietitian involvement and teams' ability to deliver effective nutrition care. Increasing dietitian involvement assisted with improving healthcare professionals' awareness of both the role of the dietitian, and nutrition issues experienced by persons living with dementia. The teams' desire for the inclusion of dietitians also contributed to increasing their involvement. Addressing these barriers and capitalizing on the facilitators is essential to improving dietitian involvement and, ultimately, patient outcomes.

Indigenous 2SLGBTQIA+ Identities and Cognitive Decline: A Scoping Review

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Research on Two-Spirit and LGBTQIA+ Indigenous communities and age-related cognitive decline is still an emerging field of study. This initiative is directed by and intended for Two-Spirit individuals and their allies to foster diversity, equity, and inclusion within dementia and age-related care. Historically, Indigenous and 2SLGBTQIA+ individuals have been neglected in cisgender and heteronormative healthcare research and practices, leading to the disregard or underdevelopment of their socio-cultural needs. This scoping review sought to answer the research question: What is the scope, breadth, and depth of published and grey literature about First Nations, Métis, and Inuit 2SLGBTQIA+ people's experiences of aging and dementia?

Expanding on a previous environmental scan conducted by members of the research team, we conducted a comprehensive search on Two-Spirit and LGBTQIA+ Indigenous individuals and age-related cognitive decline. Using an adapted scoping review protocol (Arksey & O'Malley, 2005), we identified our research question, relevant studies, selected studies, extracted data, charted the data, collated, and summarized, and are reporting results here. We collaborated with a research librarian to determine the search terms and databases to use, and Two-Spirit researchers were involved in every aspect of the project. From 1320 articles identified in the initial search, we found seven that met the inclusion criteria. The results are collated and described, summarizing and identifying the existing literature's aims, findings, and recommendations. We synthesized the data and will present these findings.

Two-Spirit and Indigenous LGBTQIA+ communities face unique challenges regarding culturally safe care and resources. We have compiled the limited research published to date, underscoring the significant gaps in this area of research. This scoping review demonstrates the need for inclusive and culturally safe care and research. Given the scarcity of research on age-related cognitive decline in Indigenous and 2SLGBTQIA+ communities, we highlight the important findings and recommendations for future research.

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

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Introduction: Dementia care in Canada must respond to the needs of an increasingly diverse population. South Asian Canadians represent one of the fastest-growing ethnic groups in the country yet continue to face significant barriers in accessing timely and culturally appropriate dementia care. Cultural stigma, language differences, and systemic gaps contribute to delays in recognizing symptoms, seeking medical advice, and obtaining a formal diagnosis. These delays often place an increased burden on care partners navigating caregiving roles within the context of cultural expectations, limited health literacy, and inadequate access to culturally aligned services.

While some challenges experienced by individuals living with dementia and their care partners are universal, such as

emotional stress and system navigation, South Asian Canadians often experience unique challenges rooted in cultural beliefs about aging, mental health, and familial responsibility. These factors influence whether dementia is viewed as a medical condition or a normal part of aging, which in turn shapes how families seek help. Despite the presence of strong caregiving traditions and multi-generational support networks within South Asian families, there is limited research exploring both shared and culturally distinct aspects of the dementia care journey. This study addresses that gap by examining the perspectives of South Asian individuals living with dementia, their care partners, physicians, and community support organization employees.

Methods: A qualitative, interpretive phenomenological approach was used to understand the lived experiences across three interconnected studies conducted in Alberta, British Columbia, and Ontario. In Study 1, semi-structured interviews were conducted with 16 participants (14 care partners and two individuals living with dementia) to understand their experiences of symptom recognition, obtaining a diagnosis, and accessing services. Study 2 involved interviews with 13 physicians from various provinces who had experience diagnosing dementia in South Asian patients. Study 3 included 14 employees from community support organizations offering dementia services to South Asian communities. Interviews were conducted in English, Hindi, and Punjabi and analyzed using reflexive thematic analysis to identify recurring and unique themes.

Results: Study 1 revealed that stigma, limited awareness, and unfamiliarity with the Canadian healthcare system were major barriers to recognizing symptoms and seeking support. Families often delay medical help due to cultural beliefs or fear of judgment. In Study 2, physicians noted difficulty navigating cultural expectations around disclosure and decision-making, generational differences in acceptance of a diagnosis, and language barriers that complicated communication. Study 3 highlighted the importance of cultural sensitivity in service delivery, the role of community partnerships in raising awareness, and the need for more sustainable funding to support culturally tailored programs. Staff emphasized the value of trust-building, representation, and ongoing community engagement to deliver effective support.

Conclusion: This research underscores the urgent need for culturally inclusive and equitable dementia care in Canada. Key recommendations include fostering cultural humility among healthcare providers, improving early diagnosis through community outreach, investing in culturally adapted resources, and enhancing support for care partners. Addressing systemic gaps and strengthening collaboration with cultural organizations are vital steps toward ensuring that diverse communities can access the care and support they need.

Neuropsychiatric Symptoms and Caregiver Burden Across the Clinical Cognitive Continuum

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Background: Neuropsychiatric symptoms (NPS) are nearly universal in dementia and increasingly recognized as early manifestations of neurodegenerative disease. These behavioural and psychological changes are distressing not only for the individuals experiencing them, but also for their caregivers. Caregiver burden is associated with poorer physical and mental health, early institutionalization of the care recipient, and greater healthcare costs. However, the behavioural predictors of caregiver stress across the clinical cognitive continuum remain poorly understood. Mild Behavioural Impairment (MBI) is an established neurobehavioural syndrome that captures the late-life emergence of persistent NPS, including apathy, affective dysregulation, impulse dyscontrol, social inappropriateness, and psychosis, prior to dementia onset. Although originally conceptualized for preclinical and prodromal populations, the MBI Checklist (MBI-C) offers a dimensional assessment of symptom severity applicable across cognitive stages, from cognitively normal (CN) to mild cognitive impairment (MCI) and dementia. This study examined associations between MBI-C scores and caregiver burden, with a focus on both total and domain-level symptom severity, and how these associations varied by cognitive status.

Methods: Participants (n = 378; mean age = 71.3 years; 41.0% CN; 54.0% female) and their informants (mean age = 64.7 years; 62.8% female) were drawn from the Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) study. Zero-inflated negative binomial regression models were used to assess cross-sectional associations between MBI-C total, domain, and apathy subdomain scores with informant Zarit Burden Interview (ZBI) scores. Models adjusted for participant and informant age and sex, relationship type, co-residency, and duration of acquaintance. Interaction terms tested whether associations differed by cognitive status.

Results: Higher total MBI-C scores were significantly associated with greater caregiver burden (Rate Ratio = 1.03; 95% CI [1.02-1.04]; adjusted $p < 0.001$), independent of cognitive status. At the domain level, apathy (1.07 [1.05-1.10]; < 0.001), impulse dyscontrol (1.05 [1.02-1.07]; 0.001), social inappropriateness (1.13 [1.05-1.22]; 0.001), and psychosis (1.11 [1.03-1.21]; 0.009) were also independently associated with higher ZBI scores. Affective dysregulation demonstrated a significant interaction with cognitive status where higher affect scores were associated with lower burden in CN participants (0.87 [0.79-0.96]; 0.006), but with higher burden in those with MCI (1.28 [1.15-1.42]; 0.001) or dementia (1.21 [1.09-1.34]; 0.001). In secondary analyses, each apathy

subdomain - diminished interest (1.15 [1.08-1.22]; 0.001), initiative (1.15 [1.09-1.22]; 0.001), and emotional reactivity (1.17 [1.08-1.27]; < 0.001) - was independently associated with greater caregiver burden.

Conclusion: These findings highlight the effect of behavioural symptoms on caregiver stress, even in the absence of cognitive impairment. The results underscore the clinical utility of the MBI-C for identifying early behavioural risk factors for caregiver burden across the cognitive continuum. Incorporating behavioural symptom monitoring into routine dementia care and prevention efforts may enable earlier interventions. Tailored support strategies that address specific symptom domains could meaningfully reduce caregiver burden and improve outcomes for both individuals at risk and their families.

Supporting the Sexual Health of People with Dementia: Building Confident, Knowledgeable Care Teams Through Education

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Healthcare providers (HCPs) often feel unprepared and unconfident in discussing, assessing, and responding to the sexual expressions of people living with dementia. To enhance HCPs' knowledge and skills in this topic area, Behavioural Supports Ontario's Sexual Expression and Dementia working group developed *Supporting the Sexual Health of People with Dementia*, a free, three-part online program.

Informed by expert consultation and over 300 academic sources, the program equips HCPs with education and resources to provide respectful, person-centred care. Module 1, released in 2021, challenges myths and stereotypes about sexuality and dementia and its evaluation informed the design of Modules 2 and 3. Module 2 offers communication strategies to discuss residents' sexual health, while Module 3 focuses on assessing responsive sexual behaviours. The program is accompanied by downloadable tools and resources that can be integrated into practice including a conversation planning and summary worksheets, conversation guidelines and a resource for responding to sexual expressions of risk.

The full program was released in February 2025 on two platforms, ALZeducate and Surge Learning, and is free to access. E-modules 2 and 3 of the program were evaluated using optional pre- and post- learning surveys. The analysis of matched pre- and post-surveys from 117 participants demonstrated significant improvements in confidence following completion of e-modules 2 and 3, particularly in using tools to assess responsive sexual behaviours and engaging in conversations about sexuality with residents. Participants also reported high satisfaction with the overall learning experience, module design, and content, with average ratings nearing 4 out of 5 across all categories. When asked what learning from the modules they will apply to their practice, learners demonstrated that learning objectives are achieved, aided by the modules' provision of practical resources.

Supporting the Sexual Health of People with Dementia supports HCPs in effectively and confidently responding to the sexual health needs of people with dementia by providing evidence informed, practice-relevant education and tools. The program guides learners, specifically those in long-term care, to utilize an inclusive and person-centred approach, prioritizing respect and dignity.

Evaluating Postoperative Delirium and Cognitive Outcomes After Perioperative Remote Ischemic Conditioning: A Systematic Review and Meta-Analysis

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Background/Objectives: Postoperative delirium (POD) and postoperative cognitive dysfunction (POCD) are common complications observed in surgical patients, contributing to extended hospital stays, worsened functional outcomes, increased risk of dementia, and diminished quality of life. Remote ischemic conditioning (RIC) - an inexpensive, non-invasive therapy involving brief cycles of ischemia and reperfusion - has emerged as a potential neuroprotective intervention to address these complications. This systematic review and meta-analysis aimed to synthesize existing evidence regarding the effects of perioperative RIC on neurocognitive outcomes in surgical patients.

Methods: The systematic review followed PRISMA guidelines and was registered with PROSPERO (CRD420251041823). A literature search was conducted in MEDLINE, Embase, and Web of Science from inception to March 16, 2025. The review focused on randomized controlled trials (RCTs) evaluating perioperative RIC in adults (≥18 years) undergoing surgery. The primary outcomes of interest were the incidence

of POD and POCD, alongside performance on global and domain-specific cognitive assessments, including the Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA), Trail Making Test (TMT), Digit Symbol Substitution Test (DSST), Digit Span Test forward/backward, Stroop, semantic/phonemic Verbal Fluency Test (VFT), and immediate/delayed verbal memory. Independent reviewers performed study screening, data extraction, and risk-of-bias assessments using the Cochrane risk of bias tool (ROB-2) with disagreements being discussed within the research team and resolved by senior researchers. Statistical analysis was conducted using the DerSimonian-Laird model, with study heterogeneity assessed through Cochran's Q.

Results: Among 4,607 screened records, 16 publications from 15 RCTs met the inclusion criteria, involving 2,912 patients. No significant differences were observed between groups regarding POD incidence within 30 days (OR: 0.77, 95% CI: 0.50-1.20, n=6), POCD incidence within 30 days (OR: 0.80, 95% CI: 0.53-1.20, n=5), or POCD incidence beyond 30 days (OR: 1.06, 95% CI: 0.62-1.90, n=3). However, patients receiving RIC demonstrated improved cognitive performance including better MoCA scores (SMD=0.48, 95% CI: 0.19-0.76, n=2) and improved Stroop test part 1 (SMD=0.33, 95% CI: 0.11-0.54, n=2) and part 2 (SMD=0.22, 95% CI: 0.01-0.44, n=2) at <30 days, along with improved MMSE scores (SMD=1.23, 95% CI: 0.89-1.58, n=2) at ≥30 days. Conversely, RIC showed no significant benefit in improving TMT A and B completion time, DSST scores, Stroop part 3, semantic/phonemic VFT, digit span forward/backward, or immediate/delayed verbal memory at any time-point.

Conclusion: Our systematic review and meta-analysis found no evidence that perioperative RIC prevents POD or POCD. While RIC showed no clear benefit for domain-specific cognitive performance, it may enhance global cognitive function; however, the limited number of studies and variability in populations, surgical procedures, and RIC delivery make conclusions uncertain. To better understand RIC's effects on cognition, future research must establish standardized definitions and assessments for POCD.

Risks and Protective Factors for Cognitive Maintenance in Men and Women: A Secondary Analysis of the Longitudinal SHARE Data

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Objective: Broader structural contexts - such as gender, socioeconomic status (SES), and welfare regimes - may play a crucial role in cognitive maintenance of older adults. However, no study has comprehensively assessed how individual and structural factors interact to influence it. This study evaluates the relative contributions of sociodemographic factors, dementia risks and protective factors, SES, and welfare type to cognitive maintenance in older men and women over a four-year follow-up.

Study design: We conducted a secondary analysis of the longitudinal data from waves 5 and 7 (2013-2017) of the Survey on Health, Aging, and Retirement in Europe (SHARE).

Methods: Cognitive maintenance was operationalised as stable, good delayed recall performance over four years. A series of multilevel logistic regression models was constructed, with a country of residence included as a random effect. Analyses were stratified by gender and welfare regime to examine contextual differences. The interaction between gender and SES in different welfare regimes was tested.

Results: From baseline, 66,038 participants, 44,860 completed the follow-up; 28,943 participants were aged between 60 and 85, of whom 28,561 had data available. Participants labelled as demonstrating cognitive maintenance (CM+) tended to be younger, separated or divorced, more engaged in leisure activities, and demonstrated better lifestyle and general health profiles. Women demonstrated a higher crude likelihood of cognitive maintenance than men (12.0% vs. 7%).

In the fully adjusted model, stratified by gender, statistically significant associations with CM were observed across both genders for age, SES, grip strength, depression, openness to experience, and individual activities. For women only, significant associations were found with physical activity, alcohol consumption, agreeableness, and community engagement. The BMI, easy access to services, and being separated or divorced reached significance exclusively for men. The models' AUCs were 80.56% in women and 79.87% in men. Country of residence explained about 9% of the CM variability in both genders.

After stratifying the sample by the types of countries' welfare ("socio-democratic," "corporative," "post-communist," and "southern"), the variance attributable to a country becomes insignificant. In a stratified sample, the crude proportion of the CM+ status importantly varied. In women, it ranged from 32% ("corporative" welfare) to 1% ("Southern" welfare), in men from 17% ("corporative") to 0.3% ("Southern") welfare. The interaction analysis in a stratified sample shows a statistically significant additive effect of gender on the association between SES and CM for all welfare types. Its relative excess probability of CM varied from 0.42 (0.16, 0.67) in to sociodemographic to 0.69 0.69 (0.38, 1) in "Southern" welfare traditions.

Dominance analysis shows age and SES as the most important CM+ predictors in all welfare types, followed by "individual" leisure activities. The impact of the rest of the predictors was less significant and often welfare-type specific.

Conclusion: Population-level interventions to reduce gender and social inequalities should be central to cognitive health

promotion strategies. Promoting leisure activities may be a promising population-level opportunity for enhancing cognitive health in older adults. Further research is needed to identify the active components of different welfare models.

Cholesterol Levels and Neuropsychiatric Symptoms Across the Neurocognitive Continuum

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Background/Objectives: Abnormalities in lipid metabolism have been implicated in the pathogenesis of neurodegenerative diseases such as Alzheimer disease (AD). High-density lipoprotein (HDL) removes cholesterol from the bloodstream for delivery to neurons, while low-density lipoprotein (LDL) is linked to vascular dysfunction. Neuropsychiatric symptoms (NPS) including apathy, mood and anxiety symptoms, agitation, impulsivity, social disinhibition, and psychosis often emerge in the prodromal phases of AD and may serve as early clinical indicators of neurodegenerative disease. Given emerging evidence that vascular processes may contribute to neuropsychiatric changes, there is growing interest in exploring how vascular risk factors like cholesterol relate to NPS. This study examines associations between cholesterol levels (HDL, LDL, and total cholesterol [TC]) and NPS in older adults across the neurocognitive continuum.

Methods/Overview: Data were obtained from the Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) study. NPS were assessed using the Mild Behavioral Impairment Checklist, with a cutoff score of ≥6 used for global NPS+/- status and ≥1 for NPS domain-specific status. Logistic regressions modeled the associations between cholesterol measures (HDL, LDL, and TC, in pg/mL) as continuous exposure variables and NPS+/- status as a dichotomous outcome, controlling for age, sex, years of education, Montreal Cognitive Assessment (MoCA) score, and apolipoprotein E ε4 (APOE4) carrier status. Associations between cholesterol types and cognition (MoCA score) were also assessed, controlling for age, sex, education and APOE4 status. Interaction terms with sex, plasma amyloid-beta 42(Aβ42) levels, and APOE4 status were also investigated.

Results: Among participants (n=415, mean age: 71.0±7.6 years, 48.4% female), 148 had dementia, and 267 were dementia-free (142 with mild cognitive impairment, 36 with subjective cognitive decline, and 89 cognitively unimpaired). Each 1 pg/mL increase in HDL was associated with 44% lower odds of having NPS+ status (OR: 0.56, 95% CI: 0.31-0.99, p=0.05). No significant interactions were found with APOE4 (p=0.95), Aβ42 (p=0.96), or sex (p=0.83). For NPS domains, HDL levels were significantly associated with lower odds of decreased motivation (OR: 0.46, 95% CI: 0.25-0.84, p=0.01) and affective dysregulation (OR: 0.46, 95% CI: 0.27-0.80, p=0.006). TC was significantly associated with lower odds of NPS+ status (OR: 0.79, 95% CI: 0.61-0.95, p=0.03) and decreased motivation (OR: 0.72, 95% CI: 0.54-0.87, p=0.003) and impulse dyscontrol (OR: 0.81, 95% CI: 0.65-1.06, p=0.04) domains. Similarly, higher LDL levels were significantly associated with lower odds of NPS+ status (OR: 0.38, 95% CI: 0.16-0.88, p= 0.03), but with a marginally non-significant interaction with Aβ42 levels (OR: 1.12, 95% CI: 0.99-1.26, p=0.06). LDL levels were also associated with the lower odds of having symptoms in the decreased motivation domain (OR: 0.81, 95% CI: 0.65-1.06, p=0.04). Cholesterol measures were not significantly associated with cognition.

Conclusion: Higher HDL, LDL, and TC were associated with lower NPS burden, but not with cognition. The association between higher LDL and lower NPS odds may be influenced by amyloid burden. The findings imply nuanced interactions between vascular and neurodegenerative processes, supporting the need for mechanistic biomarker-based studies. These findings suggest that cholesterol levels may play distinct roles in behaviour and cognition, highlighting their potential as targets for early lifestyle-based interventions in older adults.

The Behavioural Supports Ontario-Dementia Observation System (BSO-DOS©) Version 2: User-Driven Updates & Enhancements

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Background/Objectives: The Behavioural Supports Ontario-Dementia Observation System (BSO-DOS©) was released in 2019 as a standardized, reliable direct observation tool to provide objective data to identify patterns, trends, and contributing factors associated with responsive behaviours of persons living with dementia. Since its release, the BSO-DOS© (in English and French) has been downloaded

internationally over 7000 times. Here we describe a planned quality improvement project (QIP), conducted during 2024-25 to ensure Version 2 remains person-centred, feasible, accessible and clinically valuable.

Methods/Overview: A user feedback survey, academic literature, and specialty group consultation informed the development of Version 2 of the BSO-DOS©, along with new and updated accompanying resources for effective implementation.

Results: Healthcare providers (n=248) who utilized the original BSO-DOS© confirmed usefulness of the tool (86% rating the tool somewhat or very useful). While 87% of respondents indicated subsequent analysis of collected data informed care planning and/or treatment decisions, many provided rationale supporting revisions regarding behavioural menu descriptors, frequency calculations, and overall design. These valuable user-driven insights guided the development of Version 2 of the BSO-DOS©, thereby enhancing usability, improving behavioural language precision, strengthening analysis and promoting intervention planning.

The BSO-DOS©'s supporting resources were also updated based on user feedback, including a two-page fact sheet, four-page user guide, 50+ page resource manual, an instructional video, and educational slides. The resources were designed to facilitate the deep and rich application of the BSO-DOS©, and to promote its effective clinical use in evaluating tailored approaches to prevent or decrease responsive behaviours.

Conclusion: Survey respondents from across Canada confirmed the clinical value of the BSO-DOS©. User feedback provided valuable insights into opportunities for improvement, guiding content and design enhancements found in the updated tool. Released in June 2025, Version 2 the BSO-DOS© and its supporting resources are publicly available to clinical teams to allow for data driven assessment and individualized care planning.

Developing a Strategic Living Laboratory with the Ministry of Health on the First Quebec Dementia Policy

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Background/Objectives: The healthcare system is facing growing complexity as the health and social service needs of people living with dementia continue to increase dramatically. Quebec is the only province in Canada that has not only adopted an Alzheimer's Plan but also put in place a sustainable and evolving implementation strategy since 2011. Now, the launch of Quebec's first policy on Alzheimer's disease and other neurocognitive disorders (2025) is a major event. However, the effectiveness of this policy's implementation will be impacted by many ongoing transformations (e.g., potential arrival of new therapies, medical aid in dying, artificial intelligence, etc.). Our objectives therefore were to: 1) support the Quebec Ministry of Health in implementing, monitoring and adjusting the policy, 2) evaluate the policy's anticipated and unforeseen effects, 3) guide strategic decisions during implementation, and 4) identify emerging issues and prepare for the next policy cycle.

Methods/Overview: As the Research on Organization of Healthcare Services for Alzheimer's (ROSA) Team, since 2008, we have been collaboratively working to develop a partnership with the Ministry. Strategic living laboratories are a rapidly expanding field within learning health and social systems, at the intersection of medicine, data science, health policy, and systems engineering. With the launch of the first Alzheimer policy, the co-construction of a strategic living laboratory between the Quebec Ministry of Health (and strategic partners) and the ROSA Team represents an innovative response to evolving needs, integrating evidence into a continuous learning loop to improve the quality and efficiency of the healthcare system.

Results: Our longstanding collaboration has led to significant advancements in the field. Two ROSA team researchers serve as statutory members of the MSSS strategic committee since many years. An evolving dashboard has also been developed and enriched with new indicators as new issues emerge. Additionally, we conducted two rounds of presentation on regional data to all Quebec regions in 2022 and 2023. Finally, our in-progress literature review on learning health and social systems policy revealed that there are limited number of living laboratories operating at the health system or government level, and few of them focus specifically on dementia. The four living laboratory projects aiming at facilitating transitions and pathways for persons living with dementia and their care partners supported by the Unité de soutien au système de santé apprenant du Québec includes our Laval-ROSA Transilab initiative. This initiative has demonstrated promising outcomes in care and process coordination, stakeholder engagement, capacity building and training, as well as policy influence and scale-up. Expected results from our ongoing work include evidence on the impact of policy implementation on care trajectories.

Conclusion: There are many living laboratories at the operational level, including for dementia, but far fewer at the

strategic level. In our work, evidence-based decision making has been gradually implemented through a continuous collaboration between researchers and the Ministry since 2011. It has already led to a refinement of the implementation strategy, with the aim of improving care trajectories for persons living with dementia and providing better support for care partners.

Feasibility and Tolerability of Deep Repetitive Transcranial Magnetic Stimulation for Mild Cognitive Impairment in Older Adults: A Pilot Study

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Background: Mild Cognitive Impairment (MCI) is an intermediary state between normal aging and dementia, significantly affecting one's quality of life and posing a major health burden worldwide. MCI is characterized by cognitive impairment that necessitates lifestyle modifications to sustain independence and perform daily activities. It affects 21% of the geriatric population in nursing homes globally, with 60-65% of these individuals progressing to dementia. Given the lack of effective treatments and the high conversion rate to dementia, there is an urgent need for innovative therapeutic approaches to address MCI. One such promising avenue is deep Transcranial Magnetic Stimulation (dTMS), a non-invasive neuromodulation therapy which targets deeper brain structures implicated in cognitive processing. While dTMS is approved for various psychiatric conditions, its effects on MCI remain largely unexplored.

Methods: This open-label pilot study aims to evaluate the feasibility and tolerability of three dTMS coil configurations (H1, H4, and H7) in older adults with MCI. Thirty participants will be recruited and assigned to one of the three coil conditions, undergoing a six-week intervention (20 sessions). Primary outcomes include feasibility metrics such as protocol adherence, retention rates, and safety assessments. Secondary outcomes focus on cognitive function, mood, sleep, and resting-state electrophysiological activity, measured through neuropsychological testing and electroencephalography (EEG).

Conclusion: This novel study will be the first to establish preliminary evidence for dTMS in MCI, inform the design of future randomized controlled trials and address a critical gap in therapeutic options for MCI.

The Effectiveness of Memory Care Team Embedded in Primary Care

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Background: The Primary Care - Embedded Memory Service (PC-EMS) implements a dementia diagnostic team drawn from existing community partners (Alzheimer Society) and the Peterborough Family Health Team (FHT). The need to create an appropriate methodology suitable for all primary care clinicians was driven by increasing senior patient volumes, patient request for earlier diagnosis, declining numbers of Primary Care (PC) Physicians, and long wait times for specialized teams (at hospital, specialists, and specialized COE Memory Programs). PC-EMS utilizes the Research on Organization of Services for Alzheimer's (ROSA) framework, funded by the Canadian Consortium in Neurodegeneration and Aging (CCNA), and principles from the Canadian Consensus Conference on the Diagnosis and Treatment of Dementia (CCCDTD5). We created a reproducible team assessment framework embedded in primary care to support all primary care physicians. The Care Pathway integrated in the Electronic Medical Record (EMR) allow for the diagnosis of patients with memory concerns at their own family practice medical home.

Methodology: PC-EMS lead specialists provided training to existing FHT nursing staff and Alzheimer Society Client Support Coordinators, establishing a comprehensive dementia intake assessment. A PC specific EMR Dementia Care Pathway, provides a coordinated and consistent diagnostic process. The program evaluation consisted of (1) physicians' knowledge, attitudes and practice (KAP) toward dementia care (2) patient and care partners satisfaction through surveys and (3) dementia quality as measured by retrospective review of PC-EMS charts compared to pre-intervention control group charts managed with usual care pre-pandemic.

Results: 12 of the 15 referring Physicians and Nurse Practitioners, completed the surveys. Of the 50 patients in the control group and the 49 persons in the study group, a subgroup of attendees (32 patients, and 27 care partners) completed the satisfaction surveys. Chart reviews were performed on all control and study subjects; the overall quality of documentation

score was 100% (SD 0) in the study group and 20% (SD 34.6) in the control group. Charting demonstrated adherence to the Dementia Care Pathway provided. Time to follow-up by the patient's PC Physician were targeted to 2 weeks post assessment with high compliance. Patient and care partners' satisfaction and physicians' KAP scores were all high.

Conclusion: Embedded Memory Teams in Primary Care enable all Primary Care Physicians and Nurse Practitioners to diagnose dementia in a timely manner through the integration of approved protocols. This approach involves both care partners and individuals with cognitive concerns in the diagnostic process, care planning, and ongoing primary care. The methodology is reproducible and scalable for broader adoption across primary care settings.

Co-Designing Culturally Responsive KTE Products with Ethnocultural Communities: An Awareness Campaign and Policy Brief on Dementia Care

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Background: Equity-seeking ethnocultural communities face significant barriers along their dementia care journeys in accessing healthcare services and receiving timely diagnoses. These challenges are further exacerbated by the scarcity of culturally responsive and tailored resources, and prevalent distrust in healthcare systems due to historic and present discriminatory experiences. Our preliminary scan of the literature and rapid engagement with vested parties emphasized that equity-seeking and high-risk communities are not usually engaged with or targeted when designing broad public health interventions or awareness-raising campaigns. Systematic inequities make it crucial to co-design culturally and linguistically adapted Knowledge Translation and Exchange (KTE) initiatives to increase awareness and trust, address cultural stigma, and highlight experiences of resilience in minoritized communities. Through such KTE initiatives, we also aim to reach policymakers by disseminating the findings from our discussions with community members through a policy brief to ensure that policies reflect community needs.

Methods: Using a community-based participatory approach, we co-designed two KTE initiatives with three ethnocultural communities in Ontario and Quebec. Community members were engaged from the pre-design stage, independently designing and generating social media video campaigns tailored specifically to their unique needs (e.g., culturally entrenched stigmas, enhancing knowledge of dementia symptomatology, and fostering self-advocacy among the community). Videos were disseminated through social network platforms used by members of their communities. Additionally, through a series of deliberative dialogues, we engaged with members of the Black Anglophone community in Quebec to understand not only their experiences of encountering inequities in the healthcare system but also their experiences of strength and resilience in the face of these inequities. We also connected with the Alzheimer Societies of Montreal and Laval to leverage their communication channels and gain additional perspective on the issues being presented in the deliberative dialogues. Insights from these discussions shaped a policy brief translating community needs regarding the newly released ministerial policy, the Quebec Alzheimer's Plan (QAP), and will be presented to the Quebec Ministry of Health and Social Services.

Results: We expect increased dementia awareness and enhanced health-seeking behaviors within the ethnocultural communities served by our partner organizations. Through videos tailored to community needs, we anticipate that community members will have improved confidence in recognizing and differentiating dementia symptoms from symptoms related to natural aging, greater self-advocacy in discussing symptoms with healthcare providers, and reduced stigma. We will survey community organizations to assess the impact of the videos and track video shares, views, and response. Furthermore, the policy brief will offer actionable, community-identified, and prioritized recommendations for policymakers in Quebec. We will observe whether there are any subsequent changes in policy development, funding allocation, or program implementation related to social determinants of health and mitigating inequity in dementia diagnosis and support in the province.

Conclusion: By prioritizing community-defined objectives through direct engagement, this project bridges longstanding gaps between the unmet needs of equity-seeking ethnocultural populations and the broader healthcare infrastructure. Such community-centric methodologies yield culturally pertinent dementia-awareness interventions capable of counteracting systematic barriers, fostering improved dementia care outcomes, and shaping equitable health policy implementation trajectories.

Wearable Sensor Technology for the Detection and Monitoring of Neuropsychiatric Symptoms of Dementia: A Diagnostic Test Accuracy Systematic Review and Meta-analysis

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Background: Neuropsychiatric symptoms (NPS) affect most individuals living with dementia (PLWD) and are linked to poor outcomes and increased care costs. Monitoring these symptoms is challenging due to reliance on subjective assessments. Wearable sensor technology (WST) offers a promising, non-invasive solution by enabling continuous collection of physiological and behavioral data.

Objective: This diagnostic test accuracy (DTA) systematic review and meta-analysis assessed the validity of WST for detecting and/or monitoring NPS in PLWD.

Methods: A comprehensive search was conducted across nine databases (five health science: MEDLINE, EMBASE, PsycINFO, CINAHL, Scopus; and four engineering: Compendex, INSPEC, GEOBASE, IEEE Xplore). Studies were eligible if they: (1) targeted PLWD (any dementia type or severity, including mild cognitive impairment) regardless of age, sex, comorbidities, medication, or care setting; (2) used clinical assessments or observations as a reference standard for NPS detection/monitoring; and (3) reported diagnostic or criterion validity measures for WST signals or parameters. Quality was assessed using an adapted QUADAS-2 tool. Meta-analyses were conducted for studies reporting diagnostic accuracy (e.g., AUC, sensitivity, specificity) and for studies reporting correlations between WST data and reference standards.

Results: Out of 17,046 database records and 279 citation-identified studies, 51 met inclusion criteria. Six DTA studies were included in a meta-analysis, producing a pooled AUC of 0.88 (95% CI: 0.84-0.93), indicating high diagnostic performance of WST in distinguishing NPS. A separate meta-analysis of 37 studies reporting correlations found a moderate-to-strong pooled correlation for accelerometry (r = 0.64; 95% CI: 0.54-0.72) and a modest correlation for actigraphy (r = 0.30; 95% CI: 0.22-0.39). A narrative synthesis of 14 studies using heterogeneous designs supported these findings, particularly for electrodermal activity (EDA) sensors.

Significant heterogeneity was noted, and meta-regression identified moderators including observation time, reference standard type, dementia severity, and subtype. Although publication bias was suggested, sensitivity analyses confirmed the robustness of results.

Conclusion: WST shows strong potential as an objective tool for detecting and monitoring NPS in PLWD, offering a viable supplement to subjective clinical assessments. While studies vary in device type, physiological signals, and evaluation metrics, consistent findings support the validity of WST. Accelerometry showed stronger associations with movement-related symptoms (e.g., agitation, wandering), while actigraphy was moderately correlated with broader NPS. Narrative findings further confirmed the utility of EDA and motion tracking for agitation detection. Despite heterogeneity and some risk of bias, the evidence supports the reliability of WST data for assessing NPS. Future research should refine sensor protocols, report on sensitivity and specificity, employ multimodal systems, and enhance methodological consistency to improve clinical application in dementia care.

Understanding Dementia in Tamil Communities: A Narrative Literature Review of Awareness, Risk, and Cultural Barriers to Care

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Background/Objectives: As of January 2025, an estimated 771,939 individuals in Canada are living with dementia, with projections suggesting this number will approach one million by 2030. South Asians represent the largest visible minority group in Canada and face elevated dementia risk due to disproportionately high rates of diabetes, hypertension, and cardiovascular disease. Tamil-speaking communities form a substantial and rapidly aging subset of this population in the Greater Toronto Area (GTA), where first-generation immigrants are entering older adulthood. Despite this, limited research explores how dementia is perceived, understood, and managed within Tamil communities. This study, conducted as part of the Healthy Aging Initiative under the Jaffna Medical Faculty Overseas Alumni (JMFOA), aimed to synthesize existing literature on sociocultural beliefs, stigma, caregiving patterns, and diagnostic barriers affecting dementia awareness and care-seeking among Tamil and South Asian populations.

Methods/Overview: A narrative literature review was conducted to synthesize peer-reviewed studies related to dementia knowledge, cultural beliefs, caregiving dynamics, and screening practices within Tamil and South Asian communities. Boolean search combinations included: (“dementia” OR “Alzheimer’s disease”) AND (“Tamil” OR “South Asian”) AND (“awareness” OR “stigma” OR “caregiving” OR “cognitive screening” OR “cultural beliefs”). Searches were limited to English-language, peer-reviewed articles published between 2010 and 2024. Articles were included if they focused on Tamil or South Asian populations and addressed sociocultural perspectives on dementia, caregiver burden, stigma, or diagnostic approaches. Studies focusing solely on biomedical mechanisms or non-dementia neurological conditions were excluded. Of 978 records screened by title and abstract, 43 full-text articles were reviewed, and 15 met final

inclusion criteria. An inductive thematic analysis approach was used to identify key patterns.

Results: Thematic coding of the literature identified five recurrent themes: (1) cognitive changes were often normalized or attributed to spiritual causes such as karma or divine punishment, contributing to diagnostic delays of two to four years; (2) stigma led families to conceal symptoms and avoid formal care due to shame or fear of judgment; (3) caregiving responsibilities were highly gendered, frequently falling to daughters-in-law within multigenerational households, contributing to caregiver strain; (4) vascular dementia risk was elevated in Tamil and South Asian communities due to high rates of diabetes and hypertension, yet these factors were rarely addressed in public health messaging; and (5) while MoCA-Tamil is available for clinical use in Canada, it was not referenced in any reviewed materials. The Tamil ADAS-Cog lacked diaspora visibility, and RUDAS, though suited for low-literacy populations, is unavailable in Tamil. These gaps reflect a disconnect between existing screening tools and public dementia education for Tamil communities.

Conclusion: This review highlights substantial gaps in dementia awareness, diagnosis, and culturally appropriate care among Tamil populations. The findings support the development of community-informed survey instruments and educational interventions tailored to the social, cultural, and linguistic needs of this group. The methodology and insights from this review also offer a replicable framework for improving dementia literacy among other underserved ethnocultural populations in Canada.

Framework-Guided Validation of Dementia Education Resources Reveals Cultural Gaps for Tamil Communities Across Canada, the UK, and Australia

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Background/Objectives: As of January 2025, approximately 771,939 individuals in Canada are living with dementia, with projections suggesting this number will reach one million by 2030. South Asians represent the largest visible minority group in Canada, and Tamil-speaking populations, many of whom are first-generation immigrants, form a rapidly aging segment, particularly in the Greater Toronto Area (GTA). Similar demographic trends are observed in Tamil communities across the UK and Australia. Despite this, most dementia education materials remain generalized, with limited adaptation for the cultural, linguistic, and caregiving realities of Tamil populations. This study, conducted under the Healthy Aging Initiative of the Jaffna Medical Faculty Overseas Alumni (JMFOA), aimed to assess whether dementia education materials from national Alzheimer organizations in Canada, the UK, and Australia adequately reflect Tamil community needs. A secondary aim was to identify actionable gaps to inform the development of a bilingual, culturally responsive dementia guide for Tamil older adults and caregivers.

Methods/Overview: Ten publicly available dementia education resources were collected from the Alzheimer's Society of Canada, Alzheimer's Society (UK), and Dementia Australia. Each resource was evaluated using a custom validation matrix comprising ten domains derived from our previously conducted literature review and expert consultations: (1) disease framing and symptom interpretation, (2) emphasis on vascular risk factors, (3) stigma and mental health representation, (4) spiritual or cultural beliefs, (5) relevance of assessment tools, (6) language accessibility, (7) caregiver dynamics, (8) gender roles in caregiving, (9) health system navigation, and (10) inclusion of culturally relevant examples. Each domain was assessed for presence, cultural alignment, and Tamil relevance. Evaluation scores and qualitative observations were compared against the key barriers and themes previously identified in our literature review to identify gaps and inconsistencies.

Results: Most resources provided basic information on dementia symptoms, progression, and care pathways. However, major cultural gaps emerged. Only 3 of 10 resources included Tamil translations, which were literal and lacked cultural adaptation. Spiritual beliefs relevant to Tamil communities, such as karma, fatalism, or divine explanations, were absent. Vascular risk factors prevalent among Tamil populations (e.g., diabetes, hypertension) were underrepresented. Gendered caregiving patterns, particularly the burden on daughters-in-law in multigenerational households, were not acknowledged. While some resources mentioned the value of screening, none referenced culturally validated tools such as MoCA-Tamil or RUDAS, which are designed for use in diverse populations. Health system navigation guidance was generic and did not reflect barriers common among immigrant families, such as language, stigma, or mistrust. These findings directly informed the design of a new bilingual dementia resource guide tailored for Tamil-speaking communities.

Conclusion: This framework-guided validation identified significant cultural and structural gaps in publicly available dementia education resources from Canada, the UK, and Australia. The findings highlight the need for not only language translation but also deep cultural adaptation to ensure equity in dementia education. Future directions include piloting the newly developed guide with Tamil-speaking older adults and personal support workers (PSWs), followed by community-based dissemination and evaluation to improve culturally safe dementia care.

Dementia Diagnoses and Use of Healthcare Services by People with Incident Dementia in Quebec Across Neighbourhood-level Socioeconomic Status and Racialisation

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Background: Recent work reports inequities in receiving a dementia diagnosis and using healthcare services across socioeconomic status (SES) and racialisation, with worse outcomes for racialised people and those with lower SES. However, studies tend to focus on one indicator, assessed according to either SES or racialisation. Evidence from a universal healthcare system using comprehensive indicators and an intersectional approach is lacking.

Methods: We conducted a repeated yearly cohort study of community-dwelling people with incident dementia in Quebec (2000-2017). We described incident dementia diagnoses and 23 indicators of service use across five levels of material deprivation, a measure of the average income, employment and education of neighbourhoods. To understand greater nuances in primary care access and use, we also described patterns of primary care use across both the proportion of people self-identifying as a visible minority in a neighbourhood (i.e., neighbourhood-level racialisation) and material deprivation categories in a retrospective study.

Results: Of 193,834 people with incident dementia, 22% of people lived in the most deprived areas of Quebec and 18% of people lived in the least deprived areas. Rates of 15/23 indicators of service use differed across SES: for instance, people from most deprived areas had more hospitalisations, emergency department visits, prescriptions of potentially inappropriate psychotropic medications, and long-term care admissions. Mean visits to primary care were higher in less deprived and more racialised areas, with highest visits by people living in neighbourhoods that were not only the least deprived, but also the most racialised.

Conclusion: We found stark differences across SES in service use by people with dementia, in line with burgeoning literature. However, despite well-established and global findings linking lower SES to greater dementia incidence, we found that incidence was comparable across SES categories. Therefore, although lower SES was associated with worse healthcare outcomes, this discrepant finding concerning incidence and SES implies that one of the poor outcomes associated with lower SES may be a greater degree of underdiagnosis. Together, these findings might indicate different health needs and/or allude to pervasive health inequities faced by those living in lower SES areas. Using an intersectional lens allowed for a nuanced description of primary care use and inequalities therein, enabling better understanding of how people use access and use primary care across the intersections of racialisation and SES. These results can inform policies to offer equitable, appropriate, and needs-based dementia care to those that are most vulnerable, ultimately improving outcomes for all people with dementia.

Modified Titration of Donanemab Reduced ARIA-E Risk and Maintained Amyloid Reduction: 18-Month Results from TRAILBLAZER-ALZ 6

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Background: TRAILBLAZER-ALZ 6 (NCT05738486) investigated the effect of various donanemab dosing regimens on the frequency of amyloid-related imaging abnormalities with edema/sulcal effusions (ARIA-E). The modified titration arm successfully met the primary objective by significantly reducing the frequency of ARIA-E compared to the standard dosing arm, while achieving similar amyloid reduction at 24 weeks. Here we report the 76-week results of this study.

Methods: Adults with early symptomatic Alzheimer's disease (AD) and confirmed amyloid pathology (n = 843) were stratified by baseline amyloid levels and apolipoprotein E genotype and randomly assigned 1:1:1:1 (standard + three alternative donanemab dosing arms) in this randomized, double-blind, multicenter, phase 3b study. Each of the four treatment arms differed in the donanemab dosage per infusion and frequency of dosing. However, the total donanemab exposure was the same in each arm by week 16. Relative risk reduction (RRR) of ARIA-E was assessed with Bayesian logistic regression at 76 weeks. Amyloid and other AD related biomarkers were also assessed.

Results: ARIA-E frequencies for standard, modified titration, dose skipping, and Cmax arms were 24.2%, 15.6%, 18.6%, and 19.2%, respectively though 76 weeks. Consistent with the 24- and 52-week results, only the modified titration group met the predefined success criterion showing 87.1% posterior probability of achieving ≥ 20% RRR in ARIA-E frequency versus to the standard arm. Notably, no additional symptomatic ARIA-E events were observed in either arm between 52 and 76 weeks. The modified titration arm still had significantly lower ARIA-E radiographic severity (p = 0.015) and a lower symptomatic ARIA-E frequency through 76 weeks (2.8% versus 4.8% in the standard arm). Serious adverse events, discontinuations or treatment-emergent adverse events in

the modified titration arm were largely comparable to the standard dosing arm. Amyloid and plasma biomarker data will also be presented.

Conclusion: Consistent with the 24- and 52-week results, the 76-week data shows that a more gradual titration of donanemab dose significantly reduced ARIA-E risk versus standard dosing.

Type 2 Diabetes Mellitus, Cognitive Performance, and Incident Dementia; Identifying Mediating Pathways and Biomarkers from the Plasma Proteome

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Background/Objectives: Type 2 diabetes mellitus (T2DM) is associated with poorer cognitive performance and increased dementia risk. Specific pathophysiological mechanisms are not fully understood.

Methods/Overview: Prospectively collected cohort data from the UK Biobank were used. Proteomics was performed at baseline from plasma by antibody-based Olink Proximity Extension Assay. Participants completed a battery of cognitive tests at baseline from which composite scores for attention and processing speed were computed. T2DM was ascertained by ICD-10 diagnostic code, self-reported physician diagnosis, HbA1c ≥6.5%, and/or antidiabetic medication use. All-cause dementia was determined over a 15-year follow-up period. Participants with dementia and/or cancer at baseline were excluded. Linear regression and Cox proportional hazards models were used to assess associations between T2DM and cognitive scores or 15-year dementia risk, respectively. Four-way decomposition models for causal mediation were used to identify mediation and/or moderation effects of each protein (pure indirect effects, interaction effects, or blended mediated-interaction effects with $p < 0.05$ and effect sizes in the 75th percentile). Dementia mediators were inputted into a receiver operating characteristic (ROC) curve to evaluate the biomarkers' power to predict dementia incidence over the 15-year follow-up. Analyses were adjusted for age, sex, ethnicity, years of education, and apolipoprotein E (APOE)-e4 status. Pathway enrichment analyses used the KEGG Database. Analyses were repeated in sex- and APOE-e4 allele-specific subgroups.

Results: Of 13,695 participants, (n =3752 (27%) with T2DM, age =59.1 ± 7.7y, 41% female), T2DM was associated with poorer attention (β =-0.07 [-0.30, -0.17]) and processing speed (β =-0.07 [-0.05, -0.03]), and a higher risk of 15-year incident dementia (HR =2.13 [1.74, 2.61]). Females and APOE-e4 carriers demonstrated a higher incidence of dementia than males and APOE-e4 non-carriers, respectively. T2DM and sex interacted significantly to predict dementia (HR =0.63 [0.42, 0.93]) but T2DM did not interact with APOE-e4 status. A total of 1739 proteins were differentially expressed in T2DM and related to various inflammatory pathways. For cognitive outcomes, 546/540 proteins mediated attention/processing speed, respectively, and implicated inflammatory pathways (complement/coagulation cascades, cytokine-cytokine receptor interactions); 48/41 proteins moderated attention/processing speed and implicated glutathione metabolism; 65/59 proteins were mediated-moderators of attention/processing speed and implicated cytokine-cytokine receptor interactions, hematopoiesis, and phosphatidylinositol 3-kinase-Akt signaling pathway. For dementia incidence, 230 protein mediators implicated inflammatory pathways (complement/coagulation cascades, cytokine-cytokine receptor interactions, and the janus kinase-signal transducer and activator of transcription signaling pathway), 11 protein moderators (including APOE, low-density lipoprotein receptor and prostaglandin reductase 1) implicated cholesterol/lipid metabolism, while 77 mediated moderators further implicated hematopoiesis, cell adhesion, and hormone signalling pathways. In ROC curves, the dementia mediators glial fibrillary acidic protein (AUC=0.71 [0.67, 0.76]) and neurofilament light polypeptide (AUC=0.71 [0.67, 0.75]) discriminated those who developed incident dementia in T2DM with moderate accuracy, and multivariate proteomic models (AUC=0.78 [0.75, 0.81]) improved accuracy slightly beyond risk factors alone (AUC=0.74 [0.69, 0.78]).

Conclusion: This study suggests potential targets to mitigate cognitive decline and dementia risk in T2DM.

Screening for Frailty in Dementia Care: A Feasibility Study in Primary Care-based Memory Clinics

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Introduction: Canadian Consensus guidelines recommend frailty screening in memory clinic settings to facilitate early management and reduce dementia-related burden. This

study aimed to increase frailty screening capacity using gait speed with grip strength, a validated proxy for Fried Frailty criteria, and assess its feasibility in Multi-speciality Interprofessional Team (MINT) memory clinics being established in 10 primary sites across Alberta, British Columbia, and Saskatchewan.

Methods: Healthcare professionals attending a 5-day accredited MINT training program, designed to support the establishment new memory clinics received instruction on frailty screening and management. Before training participants completed a survey evaluating how well their formal education had prepared them to manage frailty (5-point scale: not at all to extremely well). They also rated their current level of knowledge of frailty assessment, ability to identify frailty and confidence in screening (5-point scales: not at all to extremely knowledgeable/capable/confident) and reported whether they routinely screened for frailty in patients with memory complaints (yes, no, not sure). Six months after clinic launch, participants completed a post-training survey assessing changes in knowledge, ability, confidence, and screening practice (5-point scale: much less now to much more now). Seven months post-launch, a follow-up survey targeted those directly involved in screening to assess satisfaction with the inclusion and ease of frailty screening, as well as its feasibility (5-point scales: not at all to extremely satisfied/feasible). Respondents also reported their discipline and years in clinical practice. For six months, each clinic tracked the number of patients assessed, number deemed frail (4m gait speed > 6 second AND hand grip strength: <15kg/m2 for females or <26mg/m2 for males), and number receiving intervention for frailty.

Results: Of the 148 healthcare providers who completed training, 106 completed the pre-survey, 34 the post-survey, and 19 involved in screening administration completed the follow-up survey; 34 pre-post surveys were matched for analysis. Survey respondents included physicians (29%), social workers (26%), nurses (23%), and others (e.g., pharmacists, occupational therapists, Alzheimer Society staff), averaging 13 years in clinical practice. Respondents rated their formal education as offering minimal preparation for managing frailty (M=2.8; SD=1.0). Before training, they reported moderate knowledge (M=3.0; SD=0.83), ability to identify frailty (M=3.0; SD=0.94), and confidence to screen (M=3.1; SD=0.86). Post-training, most reported improved knowledge (59%), ability (68%), and confidence (79%). Before training, just 21% routinely screened for frailty; after training, 74% reported increased screening frequency. Among follow-up respondents involved in screening, most were satisfied with incorporating frailty screening (63%), found it easy to complete (79%), and were satisfied with the process (74%). Overall, 79% considered frailty screening in the MINT clinic setting "very" or "extremely" feasible. Across all clinics, 368 patients were assessed; 68 (18%) were deemed frail and 46 (68%) received specific interventions for frailty.

Conclusions: Frailty-focused training improved self-reported knowledge, confidence, and capability among healthcare professionals working in memory clinics. Integrating gait speed and grip strength screening within the MINT model proved both feasible and well-received. Embedding frailty assessments in dementia care presents an important opportunity to mitigate risks associated with co-existing frailty and cognitive decline.

Alzheimer's Disease Biomarker Profiles and the Mild Behavioral Impairment Checklist

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Background: Older adults exhibiting later-life emergent and persistent behavioural changes (mild behavioural impairment [MBI]) are more likely to have underlying Alzheimer's disease (AD) and develop dementia. The MBI Checklist (MBI-C) is the gold standard measure of MBI, yet few studies have directly examined its relationship with AD pathology. We aimed to determine the association between an AD-consistent biomarker profile and MBI measured by the MBI-C in older adults without dementia.

Methods: We analyzed baseline data from dementia-free participants (n=242, 71.5±6.6 years old, 56.2% female, 33.1% cognitively unimpaired, 12.4% subjective cognitive decline, 54.5% mild cognitive impairment) in the Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) study. Biomarker profile classes were generated via Gaussian mixture modelling (GMM) based on standardized, age- and sex-adjusted multi-modal biomarker values and genetic risk. Biofluid biomarkers included plasma amyloid-b 42/40 [Ab42/40], phosphorylated tau-181 [p-tau181], glial fibrillary acidic protein [GFAP], and neurofilament light [NfL] measured using Single Molecule Array assays. Imaging biomarkers included mean cortical thickness in an AD meta-region-of-interest (entorhinal, inferior temporal, middle temporal cortices, fusiform gyrus) and bilateral hippocampal volume derived from T1-weighted structural magnetic resonance imaging using FreeSurfer v7. Genetic risk was operationalized as AD polygenic risk scores (PRS).

The GMM identified three classes, categorized post-hoc as: normal (normal plasma/imaging biomarkers, low PRS), non-AD neurodegeneration (abnormal GFAP/NfL/thickness, normal Ab42/40, p-tau181, and hippocampal volume), and AD-consistent (all biomarkers abnormal, high PRS). For the subsequent analysis, participants classified with non-AD neurodegeneration profiles (n=9) were excluded, leaving 180 (74.4%) normal and 62 (25.6%) AD-consistent participants. MBI was assessed using the informant-rated MBI-C, with scores $^{3}7$ used to classify MBI+ status.

Logistic regression examined the association between biomarker profile (exposure) and MBI status (outcome). Negative binomial regressions examined associations between

biomarker profile and total and domain-specific MBI-C scores, yielding exponentiated coefficients (e^b), which represent the ratio of MBI-C scores between groups. Models adjusted for age, sex, and education, with sensitivity analyses adjusting for Montreal Cognitive Assessment (MoCA) scores.

Results: Odds of MBI were 2.69 times greater (95% CI: [1.41-5.15], p=.003) in the AD-consistent group. Total MBI-C scores were also greater (e^b=2.12, 95% CI: 1.28-3.52, p=.004) among participants with AD-consistent profiles, as were the domains of decreased motivation (e^b=2.82, 95% CI: 1.48-5.38, p=.002), affective dysregulation (e^b=2.08, 95% CI: 1.24-3.48, p=.005), and impulse dyscontrol (e^b=1.87, 95% CI: 1.06-3.29, p=.03). MBI-C scores for the less frequently endorsed domains of social inappropriateness (e^b=1.97, 95% CI: 0.82-4.77, p=.13) and psychosis (e^b=2.19, 95% CI: 0.61-7.90, p=.23) tended to be higher in the AD-consistent group, but did not differ significantly. Adjustment for MoCA total score modestly attenuated effect sizes; most associations remained significant, except for impulse dyscontrol (e^b=1.55, 95% CI: 0.86-2.78, p=.15).

Conclusions: Dementia-free older adults with AD-consistent biomarker profiles exhibit more frequent and severe MBI symptoms, particularly decreased motivation, affective dysregulation, and impulse dyscontrol. These findings identify an association between AD biomarker profiles and MBI that cannot be fully explained by cognition. Future studies should extend this work, further investigating behavioural manifestations of AD across cognitive strata.

Vitamin D is Associated with Cognition in Young Adult University Students

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Background/Objectives: Vitamin D insufficiency, defined as serum [25(OH)D] <75 nmol/L, is common and has been linked to dementia as well as to worse cognitive functioning in healthy older adults and young adolescents. We questioned whether vitamin D status would similarly be associated with cognition in young adult university students, who are presumably at peak cognitive performance.

Methods: Participants consisted of 18-35-year-old university students residing in Northern British Columbia, Canada. Cognitive tests included the Rey-Osterrieth Complex Figure Task (ROCF), measuring visual memory, the Rey Auditory Verbal Learning Task (RAVLT), measuring verbal learning/memory, Digit Span Forward and Backward (DS-F, DS-B), measuring attention, and the Verbal Fluency Task measuring executive functioning. The Beck Depression Inventory-II (BDI-II) was used to assess mood, and mail-in blood spot test kits were used to measure 25(OH)D levels.

Results: Participants (N = 62) were 22.03 ± 3.78 years, 77.4% female, and 61.3% Caucasian/European. 25(OH)D levels ranged from 29.95 nmol/L to 161.85 nmol/L (M = 82.27, SD =28.20), and 43.5% of participants had insufficient vitamin D status (<75 nmol/L). Total vitamin D levels were significantly, positively correlated with scores on the RAVLT immediate word span (r = .39, p = .002) and the DS-F (r = .37, p = .003). The full model of ethnicity, BMI, BDI-II scores, and total 25(OH)D levels to predict RAVLT-A1 scores was significant, p = .022, Adj. R^2 = .122 and the addition of total 25(OH)D levels to the prediction of RAVLT-A1 scores led to a significant increase in R^2 of .112, p = .007. The full model of ethnicity, BMI, BDI-II scores, and total 25(OH)D levels to predict DS-F scores was not significant, p = .088, Adj. R^2 = .069; however, the addition of total 25(OH)D levels to the prediction of DS-F scores led to a significant increase in R^2 of .109, p = .010. Furthermore, participants with sufficient vitamin D status performed significantly better on these measures (t-test, Mann-Whitney U, respectively) p = .03, d = 0.58; p = .005, d = 0.65.

Conclusions: Vitamin D insufficiency was common in our sample of young adult university students residing in Northern British Columbia and was linked to worse performance on measures of verbal learning/memory and attention (i.e., immediate word and number span). This expands upon previous findings in other age groups and further supports that vitamin D plays an important role in cognition, evident even within this cognitively high-functioning group of young university students. Sufficient vitamin D status should be achieved not just in the later adult years to maintain healthy aging and possibly decrease the risk of dementia, but throughout the lifespan.

Relative Driving Speed Behaviour in Older Adults: The Influence of Mild Cognitive Impairment and Route Familiarity During Naturalistic Driving

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Background/Objectives: Route familiarity is known to influence driving behaviours like overall safety, speed choice, and distraction across age groups, including older adults. Previous research has indicated an association between route familiarity and increased driving speed during low-traffic rural settings and in urban environments. Among healthy older adults, route familiarity has been similarly linked to increased riskier driving behaviour among healthy older adults. However, the effect of mild cognitive impairment (MCI) on speed-related behaviours in familiar versus unfamiliar routes among older adults remains underexplored. This study aims to compare differences in relative speed behaviour during naturalistic driving between older adults with and without MCI, across both familiar and unfamiliar routes.

Methods/Overview: We recruited 12 older adults (age ≥ 65 years; 8 healthy, 4 with MCI) from Toronto, Ontario and

Calgary, Alberta. Each participant had a Driving Monitoring System (DMS) installed in their own vehicle for eight weeks. The DMS continuously collected data using GPS, accelerometer, and gyroscope sensors.

We defined familiar routes as those taken at least four times during the monitoring period. For comparison, unfamiliar routes were selected as the least frequently driven routes with similar durations. Speed-related behaviour was classified into acceleration, deceleration, and cruising phases using raw speed values.

Speed-related behaviour was assessed using several metrics: (1) relative speed, calculated as the ratio of actual speed to the posted speed limit, which was further categorized into acceleration, deceleration, and cruising phases; (2) lateral speed, which reflects side-to-side vehicle movement. For each metric, we calculated average values and global permutation entropy (i.e., measure of randomness in a time series). Additionally, slope values were calculated for relative speed during acceleration and deceleration phases. A repeated-measure mixed-model ANOVA (α=0.05) was used to compare speed-related behaviour across route types (familiar vs. unfamiliar) and diagnostic groups (MCI vs. healthy).

Results: A significant group effect (p=0.034) was observed in relative speed entropy measures during cruise driving, with individuals with MCI exhibiting higher randomness (0.73±0.02) compared to healthy peers (0.67±0.01). This suggests that drivers with MCI demonstrated greater irregularity patterns in their cruising speed. Route familiarity did not impact speed-related behaviours ($p>0.05$) among older adults with and without MCI. Furthermore, no interaction ($p>0.05$) effect was observed between route types and diagnostics groups.

Conclusion: Despite the limited sample size, our findings suggest that individuals with MCI exhibit greater randomness in their relative speed behaviour during cruising, indicating less consistent speed regulation compared to cognitively healthy peers. These results highlight the potential of speed entropy measures as a sensitive marker of early driving behaviour changes in individuals with MCI. Further research with larger cohorts is needed to confirm these findings and explore their implications for driving safety in older adults with cognitive impairment.

Strengthening Delirium Prevention and Management: Applying a Best Practice Guideline in a Transitional Care Unit Setting

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Background/Objectives: Delirium is a sudden and serious change in mental function, commonly affecting older adults. Without timely intervention, it can lead to long-term cognitive decline. Its prevalence is highest in acute and long-term care environments, where it significantly impacts patient safety and clinical outcomes (Health Quality Ontario, 2021).

This quality improvement initiative was conducted within a Transitional Care Unit (TCU) and aimed to implement the *Registered Nurses' Association of Ontario (RNAO)* Best Practice Guideline (BPG) on *Delirium, Dementia, and Depression in Older Adults* (RNAO, 2016). The project focused on strengthening early recognition, prevention, and management of delirium through enhanced assessment protocols, improved documentation practices, targeted staff education, and caregiver engagement.

Methods/Overview: Using RNAO's Knowledge-to-Action framework, Clinical Practice Leaders collaborated with senior management, nursing staff, and digital health partners to embed BPG recommendations into clinical workflows. Key strategies included updating policies and documentation to include standardized delirium screening (Brief Confusion Assessment Method (bCAM)) and revising care planning templates to support individualized prevention strategies. Education was delivered through targeted training and a mandatory eLearning module for staff. Engagement of staff was fostered through awareness activities and seeking regular feedback. Informal caregiver involvement was supported by an educational resource approved by the Patient and Family Advisory Council. Progress was monitored using Key Performance Indicators (KPIs) embedded in documentation and tracked internally.

Results: Following implementation, 82% of staff completed the eLearning module. Both regulated and paraprofessional staff reported increased knowledge, confidence, and comfort in recognizing and managing delirium. Qualitative feedback indicated improved understanding of delirium risk factors, causes, and prevention. Documentation compliance is improving across all four KPIs, resulting in the identification of a positive bCAM screen.

Conclusion: The implementation of the RNAO BPG on delirium within a TCU resulted in measurable improvements in clinical practice, documentation, and patient outcomes. This initiative underscores the effectiveness of a structured, evidence-based approach that integrates policy alignment, staff education, caregiver engagement, and continuous data monitoring.

Key insights for future implementation and broader dissemination include the need to:

- Optimize staffing models including RNAO Best Practice Champions (minimum of 2 per unit) to support guideline adoption.
- Prioritize new and existing patients for delirium risk factor identification and individualized delirium prevention care planning.
- Allocate sufficient time and resources to audit education and documentation uptake.

- Anticipate and plan for unanticipated disruptions, such as infectious disease outbreaks, that may affect initial go-live rollout.

These findings support the broader application of best practice guidelines to enhance care for older adults in TCU settings.

Health Quality Ontario. (2021). *Delirium Care for Adults*. https://www.hqontario.ca/Portals/0/documents/evidence/quality-standards/qs-delirium-quality-standard-en.pdf

Registered Nurses Association of Ontario. (2016). *Clinical Best Practice Guidelines Delirium, Dementia, and Depression in Older Adults: Assessment and Care Second Edition*. https://rnao.ca/sites/rnao-ca/files/bpg/RNAO_Delirium_Dementia_Depression_Older_Adults_Assessment_and_Care.pdf

Current State and Impact of Behavioural Support Transition Units in Ontario Long-Term Care Homes

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Background: Behavioural Support Transition Units (BSTUs) offer time-limited assistance to individuals with dementia and older adults with other complex mental health conditions whose behavioural care needs surpass the capabilities of their current environment. Long-term care home-based BSTUs aim to reduce the occurrence and prevalence of residents' responsive behaviours, facilitating their transition to a lower level of care upon meeting clinical goals. In Ontario, 21 BSTUs currently operate with a combined capacity of 395 residents.

Method: This presentation will synthesize the findings from the 2023 Ontario BSTU Environmental Scan alongside preliminary insights gleaned from the inaugural province-wide dataset, encompassing data from Ontario's BSTUs. Data for both of these initiatives was collected directly from all BSTUs via electronic surveys and data collection forms.

Results: The BSTU Environmental Scan provides a comprehensive analysis of the current landscape of Ontario's BSTUs, including resident demographics, environmental design, staffing models, consultation supports, and staff education. It identifies key areas for quality improvement, providing actionable insights to inform long-term care professionals regarding patient referrals. The dataset highlights critical factors that influence the efficacy of BSTUs and uncovers trends relevant to improving care delivery.

Conclusion: The dissemination of this information will contribute to a deeper collective understanding of the BSTU landscape, offering valuable insights for professionals in long-term care who currently facilitate patient transitions to and from these units. Moreover, it will enhance awareness and inform healthcare professionals seeking to explore the role and impact of BSTUs on those living with cognitive impairment who are experiencing significant behavioural care needs, as well as the broader systems that support them.

Differences in Health Service Use by Diagnosis Type Among Rural and Remote Memory Clinic Patients: A Retrospective Cohort Study

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Background/Objectives: Health care utilization has been found to vary by dementia diagnosis, with post-diagnosis use of most health services highest in persons with Lewy body dementia and mixed dementia. However, few studies have examined long-term health care use before diagnosis, particularly in persons with diagnoses of subjective cognitive decline or mild cognitive impairment. In response, this study aimed to examine differences by diagnosis type in annual rates of health service use from five years before until five years after diagnosis in a specialist memory clinic.

Methods: Using linked clinical and administrative health data, a retrospective cohort study was conducted of patients diagnosed in a specialist rural and remote memory clinic between 2004-2016. For each 5-yr period before diagnosis (pre-index) and after (post-index), differences were examined in average annual health service use between diagnosis types. Of 391 RRMC patients with complete health service coverage in both pre and post periods, 155 (39.6%) were diagnosed with Alzheimer's disease [AD] (63.9% female; age 76.2 + 7.3), 93 (23.8%) with subjective cognitive impairment [SCI] (52.7% female; age 63.0 + 11.7), 81 (20.7%) with non-AD dementia (46.9% female; age 71.0 + 10.2), and 62 (15.9%) with mild cognitive impairment [MCI] (58.1% female; age 72.1 + 10.7).

Results: In both the pre and post-index periods, diagnosis type was significantly associated with annual average number utilizing certain health services. Pre-index differences were observed for family physician visits (mean non-AD 14.9, SCI 13.7, MCI 12.1, AD 11.9, p=0.029), specialist visits (mean non-AD 12.6, SCI 9.9, AD 9.2, SCI 13.7, MCI 8.3, p=0.008), and all-type drug dispensations (mean SCI 44.1, non-AD 39.2, AD 35.1, MCI 27.6, p=0.008). Post-index differences were also observed by diagnosis type for family physician visits (mean non-AD 20.2, AD 18.8, MCI 15.4, SCI 14.1, p=0.002), specialist visits (mean non-AD 12.7, SCI 11.6, MCI 10.0, AD 9.3, p=0.037), 30-day hospital readmission (mean non-AD 10.0, SCI 6.5, MCI 4.2, AD 3.2 p=0.018), length of hospital

stay in days (mean MCI 14.0, AD 10.6, non-AD 10.2, SCI 7.2, p=0.024), and all-type drug dispensations (mean non-AD 69.4, AD 66.9, SCI 58.2, MCI 54.6, p=0.006). Further analysis revealed that SCI and non-AD diagnoses were associated with higher health service use prior to diagnosis, whereas non-AD and AD diagnoses were associated with higher utilization following diagnosis.

Conclusion: Our study demonstrated clear diagnostic differences in family physician visits, specialist visits, and all-type drug dispensations both before and after diagnosis. Additionally, post-diagnosis variations were evident in hospital readmission and length of stay. These findings add to our knowledge about variations in health service surrounding the diagnostic period, particularly among persons presenting with subjective cognitive impairment or mild cognitive impairment.

Collaborations and Resources for Dementia Care in Primary Care: A Provincial Survey of Family Physicians and Nurse Practitioners

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Background/Objectives: Family physicians and nurse practitioners are essential to effective care for persons living with dementia as they offer a familiar environment for patients and families to raise concerns about cognition and behaviour. However, evidence is limited on resources for dementia care in Canadian primary care settings. The aim of this study was to examine resources for dementia care among family physicians and nurse practitioners, including collaboration and capacity for care.

Methods: A cross-sectional postal survey was conducted from March to June 2025 with family physicians, locum tenens, and nurse practitioners in full-time or part-time practice in Saskatchewan. Questions focused on collaboration, use of resources and tools, and capacity for dementia care (knowledge, attitudes, and practice). The survey questionnaire was informed by key studies and evaluated for content and format by the research team, including three persons with lived experience, and other dementia experts. Descriptive statistics were used to analyze the data.

Results: A total 220 of 1,420 eligible individuals responded to the survey (15.5% response). Respondents included 176 family physicians (80.0%) and 44 nurse practitioners (20%), with average 18.0 years in practice (SD=12.9, range=1-50), female gender (64%), and rural practice in a community less than 10,000 (44%). The majority (74%) reported they were mainly responsible for diagnosing dementia in their patients and most (76%) referred patients or caregivers to community resources. Interactions that occurred at least once a month with cognition specialists or geriatric/memory clinics were most often with psychiatry (49%), neurology (41%), and geriatric medicine (27%). The most common reasons for interaction were managing behavioural and psychological symptoms of dementia (69%) and pharmacological treatment (64%). With other health professionals, interactions that took place at least once a month were most often with home care nurse/assessors (69%), pharmacists (66%), and registered nurses (62%), and the most common reasons for interactions were caregiver support (69%), pharmacological treatment (62%), and non-pharmacological treatment (50%). The majority characterized their interactions as "referral for consultation" with cognition specialists (71-80%) and geriatric/memory clinics (59-80%), but "close collaboration" regarding registered nurses (59%), pharmacists (51%), and nurse practitioners (50%). On a scale of 25 to 100, mean scores ranged from 74.9 (SD=13.8) for perceived competency and knowledge in dementia care to 84.5 (SD=19.2) on attitudes toward collaboration with nurses and allied health professionals, 92.6 (SD=8.4) on attitudes toward dementia care, and 94.0 (SD=7.3) on practice regarding cognitive evaluation. Tools/information resources most used to support dementia care were tools to assess cognition, mood and behaviour, and function, and least used were for malnutrition screening (1-6%) and caregiver assessment (6%).

Conclusion: Most family physicians and nurse practitioners reported collaborating closely with health professionals other than cognition specialists and geriatric/memory clinics to support dementia care for their patients, with caregiver support and non-pharmacological treatment often cited as reasons for interaction. Respondents also expressed positive attitudes overall toward collaboration with nurses and allied health professionals. These findings indicate opportunities to further build capacity for dementia care in primary care through interprofessional collaborations with local health professionals.

Donanemab in Early Symptomatic Alzheimer's Disease: Efficacy and Safety from the TRAILBLAZER-ALZ 2 Long-Term Extension

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Objective: Describe the clinical efficacy and safety of donanemab in early and delayed start participants treated during the TRAILBLAZER-ALZ 2 placebo-controlled trial and long-term extension.

Background: TRAILBLAZER-ALZ 2 (NCT04437511) is a multicenter, randomized, double-blind, placebo-controlled (PC) Phase 3 trial designed to assess the efficacy and safety of donanemab in participants with early symptomatic Alzheimer's disease (AD). Donanemab treatment significantly slowed clinical progression in the 76-week PC period. Participants completing the PC period were eligible to enter a 78-week double-blind long-term extension (LTE).

Methods: Early start (ES) participants were initially randomized to donanemab, starting treatment in the PC period. Delayed start (DS) participants (those initially randomized to placebo in the PC period) started donanemab in the LTE. Both ES and DS participants were switched to placebo if treatment completion criteria were met based on amyloid level during any study period. Participants from the Alzheimer's Disease Neuroimaging Initiative (ADNI) were selected as external control groups and weighted to match key demographics and characteristics for TRAILBLAZER-ALZ 2 at study entry/baseline. All analyses are exploratory and not controlled for multiplicity.

Results: During the LTE, the ES group continued to separate from their external ADNI control group on the Clinical Dementia Rating Scale Sum of Boxes (CDR-SB) with a difference of -1.2 (95% CI -1.7, -0.7) at 3 years. In a separate analysis, the DS group showed a difference of -0.8 (95% CI -1.3, -0.3) on the CDR-SB compared to their respective ADNI control group 76 weeks after starting donanemab. Compared to the DS group, the ES group showed a significantly lower risk of progression to the next clinical disease stage on the Clinical Dementia Rating Scale Global Score over 3 years (HR = 0.73; $p < 0.001$). In both groups, > 75% of participants assessed by PET 76 weeks after starting donanemab achieved amyloid clearance (< 24.1 Centiloids). From observed data across donanemab studies lasting up to 3 years, amyloid plaque reaccumulation was 2.4 Centiloids/year, less than the natural rate of accumulation. No new safety signals were observed compared to the established safety profile of donanemab.

Conclusions: Over 3 years, donanemab sustained clinical benefit and biological effects with a consistent safety profile in participants with early symptomatic AD, reinforcing how intervention in the early symptomatic stages of disease can change its course.

Assessing the Ethical Impact of Elder Abuse Screening in Long-Term Care: Evidence from a Pilot Evaluation of the EASI-ltc© Tool

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Background/Objectives: Efforts to detect elder abuse in long-term care (LTC) settings must balance the urgency of identification with the ethical responsibility to avoid causing emotional or psychological harm. Screening for abuse, while potentially beneficial, carries risks such as distress, re-traumatization, or unintended consequences for vulnerable residents. In recognition of this concern, we developed a structured framework to monitor and evaluate potential harm associated with participation in our pilot study of the Elder Abuse Suspicion Index - long-term care (EASI-ltc©) tool. The EASI-ltc© is a nine-question instrument administered directly to in LTC residents. It is designed to trigger further evaluation or intervention when there are concerns about possible abuse.

This feasibility study was designed to assess not only the implementation and preliminary validity of the EASI-ltc©, but also the ethical implications of administering the tool in real-world LTC settings.

Methods/Overview: We established a novel typology of possible harms and employed multiple data collection strategies to systematically evaluate the impact of the screening process on resident well-being. A total of 19 indicators of harm were identified and monitored using five distinct sources: (1) structured interviews with LTC residents guided by a modified version of the *Consequences of Screening Tool* (originally developed for intimate partner violence screening by MacMillan et al., 2009); (2) professional observations from a study social worker during abuse validation assessments; (3) resident feedback; (4) documentation by trained research assistants using an adapted Adverse Events Form; and (5) clinical chart reviews for post-participation changes or concerns.

In addition, an independent interdisciplinary safety committee convened after the enrollment of the 5th, 10th, and 20th participant to conduct interim reviews of any potential safety signals. As part of the validation visit, the social worker posed a direct question to each participant, inquiring whether the study had caused any harm, distress, or suffering. The social worker also offered a clinical judgment regarding any observed duress or discomfort.

Results: In all twenty cases, both resident responses and professional assessments indicated no evidence of harm. The vast majority indicated that their lives were either somewhat or very much improved after having participated. One participant noted mild discomfort with one specific question but did not report lasting distress or the wish to withdraw.

The absence of adverse outcomes among participating residents suggests that screening for elder abuse using the EASI-ltc©, when conducted thoughtfully and with appropriate safeguards, does not inherently cause harm. Furthermore, our multi-pronged approach to harm detection provides a replicable model for future research on elder abuse, especially in institutional settings where ethical scrutiny is heightened.

Conclusion: This study offers a unique contribution to the field by demonstrating that elder abuse screening in LTC can be ethically implemented. The use of a proactive harm-monitoring

framework strengthens confidence in both the methodology and the tool itself, helping to address a major barrier to advancing elder abuse research in LTC environments.

Ambulatory Screening to Identify Persons with Dementia at Risk for Behavioural Problems

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Background: Dementia is a progressive neurocognitive syndrome that significantly impacts individuals, caregivers, and health systems. Neuropsychiatric symptoms (NPS) are associated with caregiver burden, healthcare costs, and increased institutionalization. Among these, aggression is particularly impactful, often leading to escalated interventions and increased hospital and nursing home admissions.

Current clinical guidelines emphasize screening for NPS and related risk factors in patients with dementia (PWD). In ambulatory care settings, brief and reliable screening tools that identify behaviours are essential to enable timely interventions and prevent unnecessary hospitalizations. The Targeted Geriatric Assessment (TAGA) is a brief and structured tool designed to assess key geriatric syndromes and functional status, including mood, cognition, behaviour, and caregiver distress.

Objectives:

Primary:

Assess clinical utility of the TAGA screening tool for neurocognitive and behavioural symptom screening.

Validate screening tools for depression and other geriatric syndromes.

Determine the predictive validity of screening tools in relation to disruptive behaviours.

Overview: Hypothesis: Presence of positive screening assessments in relation to disruptive behaviours will lead to expedited access and greater healthcare utilization.

Methods: A retrospective chart review was conducted for all patients referred to the Seniors Ambulatory Clinics between November 1, 2024, and June 30, 2025.

Expected number of subjects: 350.

Results: A total of 358 patient referrals were reviewed (220 females, mean age 81.3 years; 138 males, mean age 82.1 years). Male patients had a slightly higher average number of hospital admissions (0.33) during the study period (December 2024 to May 2025). Of these, 176 patients had a scheduled appointment within the study window.

The average wait time to consultation (in days) varied by provider, with occupational therapists (OTs) having the shortest mean wait (75), followed by physiotherapists (78), geriatricians (106), behavioural interventionists (BIs) (162), and nurse navigators (NN) (166). When stratified by clinic, wait time to geriatrician assessment was shortest in the BPSD Clinic (73 days), followed by Falls and Frailty (100) and Memory Clinic (128). Wait times for BPSD Clinic by NN (43), Memory Clinic OT (76) and Falls and Frailty OT (85).

A strong correlation observed between emergency department (ED) visits and hospital admissions ($r = 0.59$, $p < .01$), as well as between time to geriatrician and clinician consultations ($r = 0.89$, $p < .01$). Weaker but statistically significant correlations were noted between time to clinician consult and disruptive behaviours, including waking family members ($r = 0.24$, $p < .01$), behaviours potentially harmful to self or others ($r = 0.24$, $p < .01$), and threats to harm others ($r = 0.20$, $p < .01$).

Conclusion: The TAGA and its Disruptive Behaviour subscales proved to be practical, time-efficient tools for assessing cognitive and behavioural symptoms, caregiver distress, and functional decline in a busy ambulatory setting. The tool demonstrated predictive validity for healthcare utilization, including ED visits and hospital admissions. Positive screening resulted in timely triage and access to appropriate services. These findings support the utility of TAGA in improving early identification of high-risk patients and enabling more responsive, targeted care planning within geriatric ambulatory programs.

Detecting Mistreatment in Long-Term Care: Findings from the Initial Validation of the EASI-ltc© Screening Tool

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Background/Objectives: Older adults living in long-term care (LTC) facilities are at elevated risk for various forms of abuse, including physical, emotional, psychological, financial abuse and neglect. Despite the high prevalence and serious consequences of elder mistreatment, there remains a significant gap in validated screening tools tailored to the unique context of LTC environments. To address this gap, our team developed the *Elder Abuse Suspicion Index - long-term care* (EASI-ltc©), the first comprehensive tool designed to

facilitate the detection of abuse among cognitively capable LTC residents. The EASI-ltc© is a nine-item tool adapted from the original EASI© to prompt further assessment or intervention if abuse is suspected, in settings where residents may be unable or reluctant to report mistreatment.

Methods/Overview: This pilot study aimed to evaluate the feasibility of EASI-ltc© implementation and to assess its initial validity. The tool was administered by trained research assistants to residents (n = 20) across three LTC facilities in Montreal, Canada. All participants had Mini-Mental State Exam (MMSE) scores ≥21, indicating sufficient cognitive function to reliably respond to tool items. Within days of completing the EASI-ltc©, residents participated in brief follow-up interviews to reflect on their experience and offer feedback regarding the clarity and acceptability of the tool.

To evaluate validity, EASI-ltc© responses were compared against comprehensive social work assessments, which served as a reference standard. Two operational definitions of abuse were used: a stringent definition (S), which required that the social worker officially flag mistreatment to the appropriate health authority, and a less restrictive one (LR), which included situations that led to further investigation or intervention, even if the latter were not formally labeled as 'abuse'.

Results: Twelve participants (60%) flagged at least one EASI-ltc© item, and a total of 26 abuse items were flagged. In total, tool items demonstrated excellent specificity (83.2% [S]; 90.5% [LR]) and negative predictive value (100% for both definitions). Using the participant as the unit of analysis, specificity (47.1% [S]; 66.7% [LR]) suggested that it effectively identified 2/3 of residents for whom further investigations were warranted. Sensitivity was 100% under both definitions, indicating that no cases identified by social work were missed by the EASI-ltc©. However, positive predictive values were more modest (25% [S] and 67% [LR]) highlighting challenges in confirming abuse in the absence of prior concern or corroborating evidence.

Importantly, residents reported feeling comfortable and respected during the administration of the EASI-ltc©. They generally found the tool questions to be understandable and not distressing, suggesting high acceptability and feasibility for use in LTC settings. These findings support the potential of the tool as a screening measure capable of distinguishing residents who are likely experiencing abuse from those who are not.

Conclusion: This study provides encouraging early evidence for the EASI-ltc© as a promising instrument for detecting abuse in LTC facilities. Future research will evaluate acceptability and feasibility by LTC staff, and focus on refining items to enhance positive predictive value and testing the tool in a larger, more diverse sample to strengthen its validity and generalizability.

Prevalence of Mental Illness Among Persons With and Without Dementia in Home Care and Long-term Care Settings in Ontario

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Background/Objectives: Mental illnesses are common among older adults and may complicate the management of other chronic conditions, including dementia. Accurate prevalence estimates are essential to optimize mental health care, particularly in at-risk populations like those receiving home care (HC) and long-term care (LTC). Our objective was to estimate the annual prevalence of mental illness among Ontario HC clients and LTC residents, using different validated case definitions for administrative data.

Methods/Overview: This population-based, repeated cross-sectional study used linked Ontario clinical and health administrative databases to estimate the annual prevalence of mental illness during fiscal 2012-2022 among adults (18+ years) receiving HC or LTC (vs comparators matched by age, sex, postal code, dementia & comorbidity). The sample included those with a first Resident Assessment Instrument completed during this period (551,926 HC, 16,102 with dementia and 181,883 LTC, 111,115 with dementia) and equivalent matched comparators. Prevalence estimates (95%CI) were derived for each index year (6 months pre-post index date=RAI assessment date) using validated case definitions, including any mental illness, mood/anxiety disorder, schizophrenia, depression and anxiety (with/without drug claims) and bipolar disorder. Prevalence ratios (study group vs comparator) were estimated using modified Poisson regression models by dementia strata.

HC clients with dementia had a mean (SD) age of 75.7 (11.2) years, 52.3% were female and 25.5% exhibited moderate/high comorbidity. Equivalent numbers for LTC residents with dementia were 82.8 (SD 8.0) years, 58.1% female, and 40.3% with moderate/high comorbidities. In fiscal 2022, HC clients with dementia (vs matched community comparators with dementia) showed a statistically significant higher prevalence for any mental illness (43.9%), mood/anxiety disorders (31.3%), depression (29.4%), anxiety (27.5%) and healthcare use for schizophrenia (2.4%) (prevalence ratios from 1.4 to 1.8) but a comparable prevalence of bipolar disorder (2.9%). Prevalence of all mental illnesses were significantly higher for LTC residents with dementia (e.g., 44.7% any mental illness, 29.2% mood/anxiety disorders, 30.1% depression, 27.3% anxiety, 3% schizophrenia, 3% bipolar disorder) vs their matched HC comparators with dementia (prevalence ratios from 1.1 [any mental illness, mood/anxiety disorders] to 2.7 [schizophrenia]).Case definitions that included prescription drug claims resulted in higher prevalences of depression and anxiety for those with dementia

in both settings (8-15% absolute increase). Overall, there was a higher prevalence of the more common mental illnesses among those with (vs without) dementia in both settings, while rarer mental illnesses were more comparable (HC) or relatively lower (LTC) for those with (vs without) dementia. Between 2012 to 2019, prevalence estimates were generally stable until 2020 when they rose for several conditions among HC and LTC residents with and without dementia (e.g., relative increase of 11.6% (HC) and 20.3% (LTC) for mood/anxiety disorders from 2019 among those with dementia). This was not observed in community comparators.

Conclusion: The prevalence of common mental illnesses was significantly higher among individuals with dementia in both care settings, with variation in estimates depending on case algorithms. These findings may inform surveillance efforts and strategies to optimize mental health care in these more vulnerable and less studied care populations.

Developing Dementia Decoded: Acute Care Dementia Strategy at the Ottawa Hospital

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Background/Purpose: Dementia cases in Canada are expected to rise from 600,000 to over 1.7 million, posing significant challenges for acute care hospitals. People living with dementia (PLWD) face disproportionate challenges in hospital, including 65% higher hospitalization rates and worse outcomes, including longer Emergency Department and hospital stays and a higher risk of harm. To address these issues, the Regional Geriatric Program of Eastern Ontario (RGPEO) and The Ottawa Hospital (TOH) have developed *Dementia Decoded* a strategy for dementia care in acute care settings - one of Canada's first comprehensive acute care dementia strategies.

Methods: Dementia Decoded was designed using mixed methods, including an environmental scan, literature review, interviews, surveys with staff, physicians, caregivers, and PLWD, and multidisciplinary focus groups with clinical and academic experts.

This scoping work, including the review of the data, was reviewed by a representative group from geriatric medicine, geriatric psychiatry, and the RGPEO.

Evaluation was also prioritized during the designed phase. A dementia scorecard was developed, mirroring the leadership corporate scorecard which included measures of patient experience, value of care (cost per case), health of populations (ALC length of stay) and patient safety (mortality and adverse health events). This tool evolved into a live dashboard to display the impact of PLWD on key hospital indicators.

Results: Key outcomes from the scoping work and surveys highlighted the need for patient-centered care, early identification of PLWD in acute settings, and staff training. These insights shaped the three initial core pillars of the *Dementia Decoded* project:

1. **Identification & Personhood**: A dementia banner in electronic health records flags PLWD upon hospital encounter and links to key behavioural and care needs for the individual
2. **Interprofessional Care Plans**: Personalized patient-centred care plans.
3. **Education**: A Dementia Champion Program to provide staff with tools and training.

Underpinning the three pillars was evaluation and the formation of the Dementia Dashboard. Using administrative coding and clinical input, the dashboard initially identified a 3.7% prevalence of PLWD in hospital—suggesting under-reporting. However, this small group accounted for 35% of ALC days, double the average cost per case, and 1.6 times higher rates of adverse events.

Discussion/Conclusion: Successful implementation will mean improved patient and caregiver experiences, better provider support, and greater health system efficiency. The importance of accurate identification and documentation of dementia in the Electronic Medical Record and bolstered internal advocacy for Dementia Decoded is vital for successful implementation. The integration of clinical strategy with performance data represents an innovative step toward comprehensive, accountable dementia care in Canada. Future directions include expanding the strategy across Ontario and replicating it nationally.

Informing the Development of an Online Education Training Program for Caregivers of Long-Term Care Residents with Impairments in Vision and/or Hearing

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Background/objectives: The COVID-19 pandemic significantly impacted long-term care (LTC) facilities in Quebec, exacerbating care provider burden and impeding the appropriate delivery of care. Among the many challenges arising as

a result of the pandemic, communication challenges were pronounced for residents with age-related sensory impairments (SI), including hearing and/or vision loss. Infection-control practices such as mandatory mask-wearing, physical distancing, and the shift to remote visits with family members and healthcare practitioners hindered effective interactions, intensifying communication challenges. Although communication challenges associated with SI are well-documented, there remains a lack of standardized procedures or training programs to support LTC staff and volunteers in addressing these needs. This project seeks to address these gaps by informing the development of an online education training program tailored for caregivers in LTC settings.

Methods/Overview: To identify caregiver knowledge gaps and guide the development of training content, an online survey was conducted with purposively selected LTC knowledge users. Survey respondents included regulated providers (members of a professional order, such as nurses, rehabilitation therapists, social workers, and other members of the interdisciplinary team, 59%) and non-regulated providers (orderlies, paid companions, volunteers, 41%). Respondents were predominantly female (90%), with an average of 8.5 years of experience in LTC. Notably, only 14% of survey participants had received prior training on communicating with persons with visual or hearing impairment. Findings from the survey were further explored in follow-up focus groups.

Results: Participants were asked to rate five pre-determined topics on a 5-point Likert scale (0 = not important, 2 = very important). Responses were ranked by group, where both groups prioritized 'actions to be taken when SI is suspected' including reporting concerns to appropriate staff (regulated = 1.77, non-regulated = 1.94), and 'alternative communication approaches for residents with SI' (1.66 and 1.60, respectively). Regulated providers emphasized 'raising awareness of the effects of SI on LTC residents' (1.74), while non-regulated providers prioritized 'identifying DSI through observable symptoms and behaviors' (1.58). These findings suggest a contrast between educational and action-oriented priorities and the importance of tailoring training content to the different caregiver roles. Focus group results reinforced the need for formal, accessible SI-related training across both provider groups.

Conclusions/Next steps: Using our results, storyboards are being developed to guide the creation of bilingual, open-access web-based training video modules for paid and volunteer LTC caregivers. These modules are being designed to reflect real-world LTC experiences and support improved delivery of care, enhanced resident quality of life, and reduced strain on LTC care providers. Once developed, our video training modules will undergo testing with end-users, and will be iteratively refined based on their feedback. Finally, we will conduct a structured evaluation to identify whether our training intervention successfully facilitates staff-to-resident interactions, reduces staff burden, and enhances resident quality of life.

Reviving Social Interaction for Healthy Aging: A Feasibility Study of Participatory Engagement of Older Adults in Dementia Prevention in Montreal and Rural Botswana

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Background and Objectives: Trials of social activity as dementia prevention suggest social engagement might reduce age-related cognitive loss. Social interventions improved aspects of executive function, lost in some types of dementia. Our three-year feasibility pilot explores three mechanisms of participatory research with older adults: 1) Engage in governance to balance personal and collective interests; 2) Analyse and apply local evidence, and 3) Support innovation to address shared interests. The study tests implementation feasibility, assessment, and data management of the participatory intervention in preparation for a full scale randomised controlled trial.

Methods Overview: The study recruits participants in Botswana by contacting older adults waiting to collect their pensions, and in Montreal through several mechanisms including advertising to relatives of patients with advanced dementia. Participants are randomised into immediate or delayed intervention (in Botswana a cluster randomization between two villages). In the intervention, small groups of older people who identify similar concerns with their daily living meet and explore ways to improve their situation collectively, liaising with other entities (e.g., health services) as necessary. We measure cognitive function in intervention and control groups at baseline and follow-up, using both the Montreal Cognitive Assessment and the Frontal Assessment Battery (FAB) and a real-world integral brain health questionnaire.

Results: This is work in progress, but some early process findings are emerging. Recruitment of potential participants among pensioners in Botswana worked well in both villages. Initial screening identified those living alone and socially isolated as eligible and they completed a baseline questionnaire and the FAB, suitably contextualized for Botswana. 19 women (2 groups) and 10 men (1 group) aged 72 to 94 years old are meeting weekly in the immediate intervention village. One group of women identified family problems as their priority concern: children foisting grandchildren onto the older women without financial or other support. The other group of

women and the men identified difficulties with health services as their main concern. They found communicating about these concerns to their families and services difficult. The researchers proposed Cellphilms (1-3 minute videos filmed with a cellphone) as a possible way forward. With support from three young fieldworkers, the old people planned and created Cellphilms about their concerns and screened them to relevant audiences in the community, (leaders, social workers, health workers, adult children, schools) sparking discussion about solutions. Community leaders are exploring sustainability options. The study has not yet reached the point of follow-up measurement, but fieldworkers report participants are engaged and have become more confident, and meeting attendance is excellent.

In Montreal, challenges in launching this participatory, community-based project include delays in obtaining ethical approval and slower-than-expected individual recruitment through advertising. Potential participants are completing eligibility screening prior to beginning group sessions.

Conclusion: Quicker project initiation in Botswana may reflect different community dynamics in the two settings. The implementation of the intervention in Botswana is encouraging. Attendance is good, the participants are moving quickly through the cycle of collective problem identification and solving, and field observations suggest their active participation may be transformative.

Prescribing Pharmacologic Therapies for Dementia: An Opinion, Attitude, and Practice Survey Among Physicians in Canada

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Background/Objectives: Despite the growing international approval of disease-modifying therapies (DMTs), cholinesterase inhibitors (ChEIs) and the NMDA receptor antagonist memantine remain the only approved pharmacologic agents for symptomatic treatment of dementia in Canada. In the absence of standardized national guidelines, prescribing practices vary considerably among physicians caring for persons living with dementia (PLWD). Furthermore, perspectives among specialists also differ regarding the significance of DMT outcomes relative to their potential risks. Our study aims to examine the perspectives and prescribing patterns of varying physician specialists regarding symptomatic treatments in dementia, along with readiness to adopt emerging DMTs

Methods/Overview: A cross-sectional, nationally representative survey was conducted among Canadian physicians involved in the care of persons living with dementia (PLWD), including neurologists, psychiatrists, geriatricians, and family physicians, with or without Care of the Elderly certification. A semi-structured questionnaire was developed, encompassing the following domains: physician demographics; use of screening tools and diagnostic approaches for dementia; general prescribing practices; use of cholinesterase inhibitors (ChEIs) and memantine; monitoring of treatment response; deprescribing practices; and perspectives on disease-modifying therapies (DMTs). The survey was distributed electronically, and responses were collected between June 2 and July 4, 2025. Data were analyzed using descriptive statistics.

Results: Seventy-seven physicians completed the survey (19% neurologists, 25% psychiatrists, 16% geriatricians, 40% family physicians). Most practiced in urban (61%) and academic (47%) settings. The Montreal Cognitive Assessment (MoCA) was the most commonly used cognitive assessment screening tool (99%), and MRI was the preferred ancillary investigation (77%).

The stage of the disease was the major factor in the initiation of these therapies: ChEIs were considered most effective in early dementia (81%), and memantine in moderate stages (61%), in keeping with current evidence. Both were perceived as only modestly effective. Discontinuation was primarily due to adverse effects or progression to severe dementia.

Eighty-one percent considered DMT outcomes meaningful; however, only 34% were very likely and 27% were somewhat likely to prescribe them once approved, while 29% were unlikely. Barriers included concerns about safety, cost, insurance coverage, and access to monitoring infrastructure.

***Conclusion*:** There is considerable variation in dementia care practices across Canadian specialists. While symptomatic therapies remain broadly used, perceptions of their efficacy vary. Attitudes toward emerging disease-modifying therapies are mixed, mainly due to systematic barriers in the Canadian landscape. These findings underscore the need for nationally based consensus guidelines, clinician education, and healthcare infrastructure planning to ensure equitable, evidence-based national dementia care. Results will inform a Delphi process to guide ChEI and memantine use and support DMT implementation in Canada.

Caregiver Stress Amongst Immigrant Tamil Caregivers of Patients with Dementia (PWD)

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Background/Objectives: Dementia care is complicated by the cultural diversity of patients and their informal caregivers. Foreign-born patients report higher stress levels, more problems, and greater service needs than their Canadian-born counterparts. Canada is home to one of the largest Tamil

Diasporas in the world, with nearly 240,000 individuals, according to the 2021 Census. In this community, family care giving for persons with dementia (PWD) is often preferred, despite the high burden on caregivers. This study aimed to: a) understand the impact of care-giving on Tamil family caregivers of PWD, b) identify factors contributing to caregiver stress, and c) assess barriers and facilitators to accessing support services. Findings aim to support the development of culturally sensitive dementia care models for this population.

Methods/Overview: Fifteen caregivers were recruited using purposive sampling in the Greater Toronto Area (GTA), Ontario, Canada. Virtual, semi-structured individual interviews were conducted between May and August 2022 until data saturation was reached. Interviews were transcribed, translated as needed, and thematically analyzed using an inductive-deductive approach based on Braun and Clarke's framework.

The Kingston Caregiver Stress Scale (KCSS) was used to quantify caregiver stress, and descriptive statistics were used for KCSS scores and demographic data.

Results: Over two-thirds of caregivers were female, with half being daughters of the care recipients. Caregivers ranged in age from 31 to 80, with the most common age group being 41-50 years. Five major themes and associated subthemes were identified: (1) Motivations for care-giving, including filial duty, personal fulfillment, societal expectations and stigma, and circumstantial obligation; (2) Division of caregiving duties, shaped by patient preferences, gender roles, caregiver capacity, and access to supports; (3) Daily caregiving stressors, such as assistance with ADLs/IADLs, patient safety concerns, behavioral changes, financial strain, and competing responsibilities; (4) Impact on caregiver lifestyle, including employment disruption, health deterioration, social isolation, and strained relationships; and (5) Barriers to service access and utilization, including limited dementia-specific education, stigma, lack of culturally appropriate services, and inconsistent personal support worker (PSW) access. The mean KCSS score was 25.4, indicating severe caregiver stress.

Conclusion: This is the first qualitative study to explore caregiver stress among Tamil immigrant caregivers of PWD. Findings reveal significant social, psychological, and physical impacts, with limited access to timely support due to systemic, cultural, societal, and language barriers. However, strong community ties, caregiver education, and culturally tailored care emerged as positive influences. These insights highlight the urgent need for culturally sensitive dementia care models for Tamil communities, with implications at local, national, and international levels. Limitations include limited generalizability due to purposive sampling, possible under representation of caregivers experiencing extreme stress, and exclusion of caregivers who rejected the dementia diagnosis or refused formal care. Additionally, as the GTA is relatively resource-rich, findings may not reflect experiences in more under served regions.

What People with Dementia and Caregivers Say Online: Analyzing Emotional and Thematic Patterns with Large Language Models

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Background/Objectives: Alzheimer's disease and related dementias (ADRD) present complex emotional, and caregiving challenges that extend beyond clinical settings. Increasingly, individuals living with dementia, caregivers, and community members are turning to online platforms like Reddit, to share experiences, ask questions, and seek support. These forums contain rich, unstructured narratives that reflect real-world dementia experiences, yet remain underutilized in research.

Prior studies on dementia-related discourse have predominantly employed coarse-grained classification (e.g., positive vs. negative sentiment), limiting the interpretability of emotional dynamics. To address this gap, the present study integrates fine-grained emotion classification with unsupervised thematic analysis to identify interpretable emotional and thematic structures from a large corpus of dementia-related forum posts forum posts using topic modelling and a custom emotion classification model. Our aim was to characterize the emotional landscape of online ADRD discourse and explore its implications for patient-centered care and digital mental health monitoring.

Methods/Overview: A corpus of approximately 200,000 dementia-related posts was collected from forums like

1. Canadian Virtual Hospice
2. ALZConnected
3. Alzheimer's Society Dementia Support Forum
4. Caregivers: Dementia Support Group, Mayo Clinic
5. r/Dementia - Reddit

and preprocessed to remove noise and stop words. To enable fine-grained emotion detection, a custom multi-label emotion classification model was developed by training and fine- tuning Longformer architecture on the GoEmotions dataset —a benchmark corpus containing 28 emotion categories. Each post was labeled with one or more emotions.

We applied BERTopic, an unsupervised topic modeling method that uses transformer embeddings and clustering

algorithms, to identify semantically coherent topics across the corpus. Emotion classification results were integrated with topic outputs to analyze emotional patterns across thematic domains.

Results: Preliminary analysis revealed dominant themes such as memory loss, caregiving duties, navigating healthcare, and end-of-life planning. Emotion classification highlighted a rich affective landscape—frequent expressions of gratitude toward caregivers, sadness over loss of autonomy, love for family, and confusion about medical procedures.

Emotions such as gratitude, optimism, and admiration appeared in approximately 45% of posts, while sadness, remorse, fear and confusion only accounted for 15% of posts.

Emotional profiles varied by topic. Posts about driving and legal restrictions expressed high anxiety and confusion, reflecting fears about accidents and perceived infantilization. Caregivers often described emotional distress over initiating driving cessation, underscoring the burden of balancing autonomy with safety.

Similarly, topics concerning homecare or hospice revealed frustration with perceived inadequacies in care quality and ethical tensions around decision making in driving. Posts revealed internal conflict among individuals facing the decision to stop driving, fear of accidents, and resentment toward perceived infantilization in care settings. Caregivers frequently described the emotional strain of being responsible for initiating driving cessation, underscoring the psychological burden of navigating safety-critical decisions in the context of advancing cognitive decline.

Conclusion: This study demonstrates the potential of combining topic modeling and fine-grained emotion classification to analyze dementia-related online discourse. The integrated BERTopic and Longformer framework offers a scalable approach for capturing public perspectives, with implications for healthcare communication, caregiver support, and future qualitative research

Emerging Evidence of Microplastics as a Culprit in the Rising Incidence of Alzheimer's Disease

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Microplastics, synthetic polymer particles under five millimetres in diameter, are now prevalent in the environment and increasingly detected in the human body, including in blood and brain tissue. As research into their health impacts expands, growing attention is being paid to their potential role in the pathogenesis of neurodegenerative diseases, particularly Alzheimer's disease. This pilot review synthesizes emerging evidence from animal studies, human biomonitoring data, and environmental health research to investigate whether microplastic exposure may contribute to the development of Alzheimer's disease. The review focuses on mechanistic pathways including blood-brain barrier permeability, oxidative stress, microglial activation, and chronic neuroinflammation. Observational patterns linking plastic pollution and cognitive decline were also considered.

Preclinical findings consistently demonstrate that microplastics can cross the blood-brain barrier, accumulate in brain tissue, and induce biological responses relevant to Alzheimer's pathology. In murine models, exposure to polystyrene micro- and nanoparticles has led to increased amyloid-β accumulation, impaired memory and learning, and heightened markers of oxidative stress and inflammation. These outcomes mirror key features of human neurodegeneration. Human studies, though more limited, have confirmed the presence of microplastic particles in blood and post-mortem brain samples, suggesting systemic circulation and neural bioaccumulation. While direct causal relationships in humans have not yet been established, the detection of microplastics in the central nervous system suggests the plausibility of their involvement in disease processes. This will be a systematic review and a comprehensive literature search will be performed across PubMed, Embase, Scopus, and Web of Science to identify and analyze peer-reviewed studies examining the link between microplastic exposure and Alzheimer's disease. Inclusion criteria will encompass studies of human populations, animal models, or in-vitro systems that investigate neurotoxicity or dementia-related pathology associated with microplastics. All selected studies of the final review will meet additional criteria for relevance and specificity, such as being published as of 2016 or later, among other conditions.

In conclusion, current evidence points to microplastics as a credible environmental factor in Alzheimer's disease pathogenesis. While research in this area remains emergent, mechanistic and observational data together support the hypothesis that microplastics may contribute to cognitive decline through pathways such as neuroinflammation, oxidative stress, and blood-brain barrier disruption. To advance the field, targeted epidemiological research is urgently needed to establish exposure-outcome relationships in human populations and to quantify the potential burden of neurodegenerative disease attributable to microplastic exposure. Furthermore, this study aims to raise awareness and encourage policy-driven preventative strategies led by healthcare professionals and policymakers, such as regulating plastic waste, enhancing environmental monitoring, and promoting public health interventions.

Additional research is needed to analyze microplastic concentration and composition in water and soil samples from

densely populated areas across the Greater Toronto Area (GTA). We are currently in the process of securing the grant to work on further studies.

Lived Experiences of Dementia Care among Chinese Canadians in Quebec

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Background/Objectives: Major neurocognitive disorders (MNDs), including dementia, are projected to rise significantly in Canada in the coming decades. These progressive, incurable conditions require complex and sustained care. By 2050, individuals of Asian ancestry are expected to represent 24% of Canada's dementia population. Among them, Chinese immigrants—Canada's second-largest visible minority and the largest subgroup of Asian origin—face disproportionate risks due to migration-related barriers, cultural stigma, and systemic gaps in care. Over 96% of Chinese adults aged 60 and older are foreign-born, with many having limited proficiency in English or French and holding traditional health beliefs that may not align with Western healthcare norms. These factors often lead to delayed diagnosis, underuse of services, and increased isolation for both patients and caregivers. Despite these challenges, there is limited research on the lived experiences of Chinese immigrants with dementia, contributing to a mismatch between available services and actual care needs. This study will explore the care experiences of Chinese immigrants in Quebec aged 65 and older who are living with or at risk of developing MNDs, along with the perspectives of their caregivers, family physicians, and interprofessional healthcare teams.

Methods/Overview: This qualitative study is part of a larger mixed-methods research project examining equity in dementia care in migrant communities in Quebec and Ontario. Semi-structured, in-depth interviews will be conducted with Chinese immigrants aged 65 and older who are living with dementia or showing early signs of cognitive decline, as well as with their informal caregivers and relevant healthcare professionals (e.g., physicians, nurses, specialists, social workers). Participants will be recruited through community organizations, clinics, and aging support networks across Quebec. Thematic analysis will be used to examine how cultural values, caregiving norms, and systemic barriers shape the dementia care experience.

Results/Future Directions: The study will improve understanding of how cultural stigma, dementia awareness, care expectations, and past experiences influence primary care service use among older Chinese immigrants in Quebec. Studying lived experiences is important to discover blind spots in service delivery; it increases healthcare professionals' insight into patients' realities and supports care tailored to their needs. In Canada, there is still a lack of detailed knowledge on frontline inequities in access, continuity of care, and patient experience. By studying these inequities through a culturally sensitive lens, the study aims to find structural barriers and identify culturally relevant factors. The outcomes of this research include: (1) advancing the understanding of the care needs of Chinese immigrants with dementia and the support needs of their care partners; (2) informing the development of culturally safe, accessible, and relevant resources for healthcare professionals working with Chinese immigrant families; and (3) generating evidence-based recommendations to improve access, continuity, and equity in health systems. Ultimately, this study aims to contribute to a more inclusive, just, and patient-centered healthcare system for Canada's aging immigrant populations, while helping expand the scope of intersectionality research in dementia care, particularly in relation to Canada's second-largest migrant population.

COMPASS-ND, The Longitudinal Study of the Canadian Consortium on Neurodegeneration in Aging: 2014-2025 Update

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Background: The Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) investigates three primary objectives: identify who is at risk of developing dementia, determine how early cognitive decline can be detected, and which tests, or combination of tests, are most effective at detecting neurodegeneration and dementia. Broad inclusion criteria have allowed inclusion of participants across the spectrum, from normal cognition to mild impairment to various types of dementia, including mixed dementia.

Methods: Recruitment has been primarily from advertising and specialty clinics for neurocognitive disorders and/or memory impairment. Enrolled participants underwent 4-5 visits to complete the baseline assessment (Time 1), including screening, clinical, and neuropsychology evaluations; MRI; optional lumbar puncture; and biosample collection. A longitudinal assessment (Time 2) occurred on average three years later. Robust data validation was completed for both timepoints. Analyses of genetic, neuroimaging, cerebrospinal fluid (CSF), microbiome, and blood biomarkers have been completed.

Results: Between 2016-2022 (CCNA Phases I-II), COMPASS-ND collected baseline data from 1,173 participants at 32 Canadian sites across eleven diagnostic cohorts: cognitively unimpaired (n=176), subjective cognitive impairment (n=147), amnestic mild cognitive impairment (MCI; n=275), MCI with silent vascular lesions (V-MCI, n=161), Alzheimer's disease (n=111), mixed dementia (n=83), frontotemporal dementia (n=44), Parkinson's disease (PD; n=83), PD-MCI (n=44), PD dementia (n=17), and Lewy body disease (n=32). Data comprise extensive alphanumeric data plus objective sensory measures; clinically verified diagnoses; psychosocial

and neuropsychiatric measures; conversational speech recordings; study partner questionnaires; genetics; and biomarkers. Time 2 follow-up data (2018-2024) include abbreviated screening, clinical, and neuropsychological measures from 565 participants. Forty-four participants have donated their brains for autopsy.

All data are stored on the Longitudinal Online Research and Imaging System (LORIS). Baseline data, fully released since 2024, are available in a searchable format, with access contingent on project approval by the Data Access Committee. Thus far, 129 data access requests have been approved, yielding 50 research publications and counting.

COMPASS-ND Phase III includes another longitudinal assessment (Time 3), repeating the more extensive baseline protocol, including full clinical and neuropsychology assessments, MRI, and biosample collection. Additional dietary, neurodiversity, and vaccine history questionnaires have been added. Cohort diversity will be expanded by recruiting participants with up to Grade 12 education (n=400) who are cognitively unimpaired, or who have SCI, MCI, V-MCI, PD, or PD-MCI. Recruitment has commenced, involving novel recruitment approaches, with monthly recruitment targets and cohort sex balance closely monitored.

Discussion: COMPASS-ND is a Canadian observational study of participants meeting diverse inclusion criteria representing the full spectrum of neurodegeneration. This distinguishes COMPASS-ND from other national studies. COMPASS-ND recruitment and data collection has been done with relatively low site-level funding.

All data are presently accessible to approved researchers and trainees in Canada. In response to substantial demand, broader access will be implemented in 2026 through a tiered open access model, currently under development. Open Science in COMPASS-ND is a crucial priority with efforts underway to make our data scalable, secure, findable, accessible, interoperable, reuseable, and ethically sound.

"We Finally have an Answer": Communication of Diagnosis and Experiences of Assessment in Rural Primary Care Memory Clinics

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Background/Objectives: Accurate and timely communication of a dementia diagnosis is essential to support access to resources, care planning, and maximizing quality of life. However, the process of disclosing a dementia diagnosis can be challenging for some healthcare providers, people living with dementia, and their care partners. In rural areas, these challenges are compounded by limited access to appropriate dementia care services. While Rural Dementia Action Research (RaDAR) rural primary care memory clinics have demonstrated feasibility and sustainability, there is limited information regarding the diagnosis experience in these contexts. The purpose of this study was to explore the experiences of patients and their care partners receiving a diagnosis and recommendations for services and supports by rural primary care memory clinic teams, and the nature of follow-up care and informal support in the short-term following assessment.

Methods/Overview: This qualitative descriptive study explored the perspectives of patients and their care partners after their appointment in a rural primary care memory clinic. Eighteen participants, including two memory clinic patients and 16 care partners, were recruited across seven rural communities in Saskatchewan and interviewed by telephone within one week and one month following their appointment. Semi-structured interviews, conducted between September 2024 and February 2025, explored experiences with diagnosis communication, recommendations for care, and access to follow-up care and informal support. Reflexive thematic analysis followed Braun and Clarke's six-phase approach, with inductive coding and iterative theme development supported by research team discussions.

Results: Three themes captured participant experiences: 1) *Putting the Wheels in Motion:* Participants described the memory clinic as a pivotal starting point in their dementia care journey. The coordinated, interprofessional approach provided clarity and a sense of direction. 2) *Building Momentum:* The clinic experience often initiated important care decisions and opened access to services. Participants valued having a clear plan, written summaries, and ongoing access to clinic teams. However, some noted gaps in follow-up communication, limited availability of local services, and uncertainty about next steps. Several care partners expressed a desire for scheduled check-ins to clarify emerging questions. 3) *Don't Put the Cart Before the Horse:* While the clinic day was efficient and supportive, it was also taxing. Participants emphasized the need for realistic expectations and time to process the diagnosis and recommendations, noting that questions surfaced days after the appointment. Participants who did not receive printed materials or follow-up contact felt uncertain how to proceed.

Conclusion: The findings emphasize the value of rural primary care memory clinics in delivering person-centred dementia care and the need for continued support beyond the initial diagnosis. Participants appreciated the clarity and support provided during the clinic appointment and highlighted the need for structured follow-up to address evolving questions and care needs. Ensuring patients and care partners receive written materials, clear next steps, and accessible follow-up is essential to sustaining momentum and supporting continuity of care. Enhancing follow-up processes and tailoring supports to rural contexts can strengthen the impacts of memory clinics and may improve outcomes for people living with dementia and their care partners.

Building the Foundation for DMT Readiness: Co-Design, Implementation, and Early Results from the Canadian Dementia Registry Project

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Background/Objectives: In early 2024, the Alzheimer Society of Ontario (ASO) and the Ontario Brain Institute (OBI) partnered to investigate the feasibility and implementation of a dementia registry for Canada as part of a readiness strategy for disease-modifying therapies (DMTs) for dementia.

The dementia registry project has two main aims: (1) to provide complementary evidence that fills gaps in understanding the journey of people living with dementia (PLWD) – especially earlier in the dementia journey; and (2) to create a series of observational cohorts embedded in the registry to evaluate the real-world validity for screening, diagnosis, monitoring, and supportive interventions/treatments.

Here we provide an update on the co-design and current state of implementation, with reflections on the utility of a community-based dementia registry across Canada to capture real-world data and inform dementia care pathway development.

Methods: ASO commissioned a jurisdictional scan of 235 studies associated with 18 unique surveillance dementia registries in high-income countries (Zissimopoulous et al., manuscript in review). This review identified promising practices and informed the development of a proposed minimum dataset for the Canadian context.

ASO and OBI engaged clinicians, people with lived experience, and researchers across Ontario to determine the initial approach to collecting data and to explore the feasibility of launching a dementia registry in the community. Informed by this engagement, an expert advisory group including administrators, clinicians, industry partners, people with lived experience, and researchers was convened to provide ongoing guidance on standardized data elements, implementation strategies, and data analysis.

Following informed consent, dementia registry participants complete: a structured clinical interview; cognitive (i.e., MoCA, MMSE, and/or Canadian Indigenous Cognitive Assessment as applicable), physical (i.e., ADLs and IADLs), and psychological screening (i.e., PHQ-9 and GAD-7); and quality of life assessment (i.e., WHOQOL-BREF). Demographic characteristics (i.e., sex, gender, sexual orientation, marital status, ethnicity, race, language, education, job and income, disability, handedness, postal code, etc.) are also collected to understand the representativeness of the registry compared to the general population and existing studies of the dementia population.

Participants are re-contacted six months post-assessment to complete a survey that gathers information on: assessment experience, status of diagnosis, treatment plan, support system, and gaps in care/support.

Results: The dementia registry project has been implemented in three communities – Durham Region, Sault Ste. Marie & Algoma, and Sudbury-Manitoulin-North Bay. For the first 94 participants recruited (54 women, 40 men), ages ranged from 35-94 (mean = 70). MoCA scores varied from 7-29/30 (mean = 21/30), indicating a broad range of cognitive function/impairment.

Conclusion: Health card data are collected from participants with the goal of linking to other administrative databases for further study of the population. The project team is collaborating with the expert advisory group to standardize assessment of care partner burden, a critical yet underreported measure in the jurisdictional scan of other dementia registries.

The dementia registry project has the potential to improve timely detection and diagnosis of mild cognitive impairment and dementia, while growing a centralized repository of real-world data that will support DMT readiness and other research efforts into dementia in Canada.

Evaluation of the Memory Support System in a Canadian Memory Clinic and Geriatric Day Hospital

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Background/Objectives: Individuals with Mild Cognitive Impairment (MCI) are at increased risk for developing dementia and have difficulty maintaining independence with their instrumental activities of daily living (IADLs). The Memory Support System (MSS), is a calendar and note-taking tool that aids individuals with MCI in maintaining their independence in IADLs, currently offered at multiple sites in the U.S. The goal of this study is to determine the feasibility of providing the MSS in Canadian memory clinic and day hospital and to evaluate the treatment efficacy of the MSS intervention.

Methods: This study investigated the use of the MSS in participant dyads consisting of an individual with MCI-and their study partner. The intervention is administered to the participant and their study partner in 10 sessions over 3-4 weeks. Sessions are administered in person or virtually. At baseline, at treatment end, and 8-weeks follow up, self-efficacy for memory, mood, caregiver burden, quality of life, MSS adherence, and IADL changes are assessed. Recruitment is ongoing with a target of 20 dyads.

Results: Preliminary data are presented from two participant dyads who completed the intervention and follow-up visit. One participant exhibited a general increase in self- efficacy, including increased confidence in completing their daily tasks without asking for help, managing their memory loss, and being able to reduce emotional distress on their study partner. Both study partners reported an improvement in the everyday cognition of the participants, consisting of everyday tasks, planning, organization, and concentration on a given task. At 8-week follow-up, both study partners also reported an increase in the quality of life of the participants. Moreover, the study partner of one participant reported an improvement in their IADLs, such as paying bills, remembering appointments, and other important dates. Compliance with the use of the MSS calendar was lower in one individual who reported using an electronic calendar system in their daily life.

Discussion: Participant self-efficacy for memory, everyday cognition for tasks, and quality of life remained stable or improved in participants, as seen in previous work on the MSS. Ongoing compliance with the use of the MSS may be impacted by the type of calendar system used by participants prior to MSS training. Future work will compare treatment efficacy for the entire Ottawa cohort to outcomes from prior MSS cohorts. Determining the feasibility and efficacy of the MSS intervention will provide support to offer the MSS as a clinical program for individuals with MCI across Canada.

Intersection Navigation and Speed Patterns on Familiar Routes Differentiate Older Drivers with Mild Cognitive Impairment

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Background: Most collisions among older drivers occur close to home, where driving routes are most familiar. While familiarity can reduce cognitive demand, it may also lead to reduced attention and increased reliance on habits. This study examines whether older adults with mild cognitive impairment (MCI) can be distinguished from healthy controls (CTL) based on their real-world driving behaviours captured on their most frequently traveled routes.

Methods: Naturalistic driving data was collected using an in-vehicle Driving Monitoring System (DMS) over an eight-week period from 21 older drivers (13 CTL, 8 MCI) recruited in Calgary (n = 13) and Toronto (n = 8). The DMS continuously recorded data via GPS and inertial sensors. Each participant's most familiar route was identified using a clustering technique, selecting the cluster with the highest trip count as the most familiar route.

Eleven driving features were extracted for model development: (1) count and (2) percentage of time spent speeding (defined as driving ≥10% above the posted speed limit), (3) count and (4) percentage of time spent below speed limit (≤80% of the speed limit), (5) number of sudden acceleration events, and (6) number of sudden braking events, and (7) average trip length (km). Intersection maneuver speed was captured as average speed when drivers (8) passed through without slowing, (9) slowed before entering, or (10) came to a complete stop before proceeding. An overall average intersection speed (11) was also computed. Finally, sex and study site were included in the model.

A machine learning model (XGBoost) was employed to determine whether a trip belongs to an MCI or CTL driver, using the mentioned driving features. Trips were grouped by participant, with 80% of participants' trips used for training the model and 20% used for testing the model. Final model performance was evaluated at the trip level using four metrics: sensitivity (the ability to correctly identify trips made by participants with MCI), specificity (the ability to correctly identify trips made by CTL participants), accuracy (the overall proportion of correctly classified trips), and area under the curve (AUC), which reflects the model's ability to distinguish between MCI and CTL trips. Finally, the most important features were identified.

Results: Among 21 drivers (12 women, 9 men), 143 trips (84 trips from healthy drivers and 59 from drivers with MCI) on familiar routes were analyzed. On the test set, the model achieved an AUC of 0.79 and an accuracy of 0.73. It demonstrated high sensitivity (92%) in identifying MCI trips but lower specificity (46%), indicating some misclassification of healthy trips. The five most important identified factors were participant sex, site, mean intersection speed when driving through (without stopping or slowing), trip length, and rate of sudden braking per kilometer.

Conclusion: This early analysis suggests real-world driving on familiar routes could help identify older adults with possible MCI. Given the high sensitivity but low specificity, this approach may work best as a screening tool to prompt further testing. Larger and more diverse studies are needed to improve specificity and validate these initial findings.

An Environmental Scan of Services that Support Communication between Primary Care Providers and Specialists in Dementia Care Across Canada

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Background: The rising prevalence of dementia in Canada is placing increasing demands on the healthcare system. Primary care providers (PCPs), including family physicians and nurse practitioners, are expected to take a leading role in the detection, diagnosis, and management of dementia, often in collaboration with specialists and community agencies. While many PCPs are motivated to provide this care, they may lack adequate training, support, and time to do so effectively. To address these challenges, several programs and systems have been implemented across Canada to improve communication and coordination between PCPs and specialists. However, these services vary widely by region in terms of scope, delivery, and uptake. This environmental scan aims to identify and describe existing systems and services that support communications between PCPs and specialists in dementia care across Canada. By mapping out these models, we hope to gain insight into how they are used, and find opportunities for more consistent, equitable, and integrated care delivery.

Methods: To understand the current landscape of interprofessional communication models in dementia care in Canada, this environmental scan will include three components: literature review; grey literature search; and consultations with knowledge users including clinicians, researchers, and policy makers to help validate and contextualize the findings from the previous methods. We will extract information describing the models and their purpose, and any additional information on evaluations of their reach, adoption, and impact on equitable access and health outcomes for persons with dementia. We will also identify barriers and facilitators that influence the implementation and sustainability of these models.

Results: Findings will produce a comprehensive overview of current programs and models that support communication between PCPs and specialists in dementia care across Canada. We expect to have results by the end of August. Findings from the different sources will be synthesized to highlight common approaches, regional innovations, and gaps in existing services.

Conclusion: This environmental scan will provide a national portrait of how communication between PCPs and specialists in dementia care is currently supported across Canada. By identifying where needs are being met and where critical gaps remain, the findings will offer valuable insights into issues of access, equity, and system integration. Our results will help guide the development of targeted interventions and inform policy decisions. This work aims to support policymakers, healthcare leaders, and system planners seeking to optimize dementia care delivery through improved interprofessional collaboration and resource alignment to improve the delivery of dementia care nationwide. This work will ultimately support better outcomes for people living with dementia and their families.

Integrating Social and Structural Determinants of Health in Research on Aging and Alzheimer's Disease in Canada

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Background: Certain communities, including ethnic and cultural minorities, experience disproportionately higher rates of dementia and worse outcomes.[1,2] Structural and social determinants of health (SSDH)—the conditions in which people are born, live, work, and age[3]—are likely key drivers of these disparities.[4] The effects of SSDH accumulate over the life-course, influencing physical, mental, and brain health, as well as the ability to adopt healthy behaviors.[4] Despite growing recognition of their role in dementia inequities, SSDH remain inconsistently integrated into research, and Canada lacks specific guidelines for their inclusion in dementia studies.

Objectives: This project seeks to provide clear guidance for integrating SSDH into aging and dementia research in Canada. In collaboration with a network of stakeholders and knowledge users, we are developing a recommendation framework grounded in community and expert input.

Methods: To ensure a comprehensive approach, we are: 1) engaging community partners (e.g., individuals with lived experience, advocates for marginalized communities) through mind mapping sessions to identify factors they view as most critical to maintaining brain health in aging; 2) reviewing current practices for assessing SSDH in Canadian longitudinal studies on dementia and aging through an environmental scan; 3) conducting a Delphi study to identify key SSDH indicators that should be prioritized according to experts; and 4) launching a national survey in a large sample (N = 600) of Canadian adults (aged 30+) to gather the perspectives and priorities of the population on what matters most to health. The resulting guidance framework will be shared as an online toolkit to facilitate adoption and promote harmonization across Canadian cohorts.

Results: Preliminary findings of our environmental scan (data extracted independently by two reviewers across 6 cohorts: CLSA, CIMA-Q, PREVENT-AD, COMPASS-ND,

TRIAD, and CAN-PROTECT) show that several SSDH domains are well characterized (e.g., ethnicity and culture, social functioning, occupation and social status). However, other domains—such as environment, literacy, and economic factors—warrant more in-depth characterization. We also noted measurement inconsistencies across studies.

Focus groups with community partners revealed additional factors influencing brain health in diverse communities. Themes emerging from these discussions include the importance of belonging and safety for social participation, purpose in life, accessibility, and the stigma associated with cognitive impairment. These preliminary themes will be explored more systematically through formal qualitative analysis.

The first phase of Delphi is currently underway, with 17 experts having completed the survey to date, and the public survey is about to launch.

Conclusion: Adopting a harmonized SSDH battery across Canadian cohorts will enable the generation of large, pooled datasets, allowing for robust investigations of SSDH variables and their interactions. Although this initiative is tailored to the Canadian context, we hope it can serve as a model for other countries and be adapted to address dementia-related inequities worldwide.

Engaging Equity-Deserving Groups in Dementia Research: The Value of Participatory Co-Design Approaches

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Background: Social determinants of health, such as racialization and socioeconomic status, influence both the risk of developing dementia and access to quality care. However, many dementia studies lack representation from equity-deserving groups, resulting in gaps in understanding their unique needs and the barriers they face in accessing appropriate care. With growing awareness of and interest in addressing these gaps, sharing effective engagement strategies and inclusive research practices becomes essential for research relevance and impact. This study aims to identify challenges in engaging people with lived and living experience of dementia (PWLLED) from underserved communities and provide evidence-based strategies to address these challenges.

Method: We used a participatory, co-design approach to co-create an interview guide and recruitment strategy to capture the perspectives on eConsult's impact in improving access to specialist care for PWLLED from underserved communities. A rapid review was completed prior to the development of study materials. PWLLED reviewed and refined materials through two virtual co-design sessions. Additional feedback was received via email.

Results: Revisions improved the tool's relevance for PWLLED by simplifying language, removing a redundant item, and adding questions on patient preferences, comfort discussing eConsult with their PCPs, and barriers faced by underserved communities. Recruitment strategies were developed, focusing on ensuring representation across diverse populations, including racialized and linguistic minorities, rural residents, long-term care residents, women and gender minorities, members of the 2SLGBTQIA+ community, and early onset dementia patients. These lessons showcase effective strategies for co-designing research tools, addressing challenges, and providing valuable guidance for researchers aiming to engage underserved communities in health services research.

Conclusion: Participatory, co-design approach fosters inclusivity and shared ownership of research processes and outcomes. It also ensures that future research decisions are informed by PWLLED. These approaches are crucial for improving the representation of underserved communities in dementia research and ensuring their needs are reflected in care delivery design.

Lecanemab Clarity AD Open-Label Extension in Early Alzheimer's Disease: Initial Findings From the 48-Month Analysis

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Background: Lecanemab is a humanized IgG1 monoclonal antibody that binds with high affinity to amyloid-beta (Aβ) protofibrils. In the 18-month, phase 3 Clarity AD study, lecanemab demonstrated amyloid reduction and cognition and function decline slowing in participants with early symptomatic Alzheimer's disease (AD). An ongoing open-label extension (OLE) of Clarity AD is evaluating long-term safety and efficacy of lecanemab. Herein, we report the initial findings up to 48 months from the ongoing Clarity AD OLE study.

Method: Clarity AD is an 18-month, randomized study (Core) followed by an OLE phase in individuals with early AD. Clinical (CDR-SB, ADAS-Cog14, and ADCS-MCI-ADL) outcomes and safety were evaluated from OLE data out to 48 months. Continued lecanemab treatment in the OLE beyond the 18 months from the Core study was compared to a matched control from Alzheimer's Disease Neuroimaging

Initiative (ADNI) data. Subgroup analyses were conducted for participants with no/low baseline tau. Efficacy assessments were also summarized as the percentage of participants who had 'no decline' or had 'improvement' from Core baseline at each timepoint.

Result: Overall, 1734 participants were treated with lecanemab across the Core and OLE. Across clinical endpoints, lecanemab-treated participants continued to benefit through 48 months. In the OLE, lecanemab treatment continued to delay progression through 48 months compared to ADNI matched control, with differences in CDR-SB increasing over 18 months (0.52), 36 months (1.01), and 48 months (1.75). Consistent rates of clinical stability or improvements were observed across assessments regardless of baseline tau levels, with the highest rates of improvements observed for the no/low tau group at 48 months (CDR-SB: no decline: 69%, improvement: 56%; ADAS-Cog14: no decline: 51%, improvement: 51%; ADCS MCI-ADL: no decline: 64%, improvement: 58%). No new safety signals were observed. ARIA rates were low and similar to ARIA rates on placebo after 6 months.

Conclusion: In Clarity AD, the observed increasing treatment difference with ongoing lecanemab treatment in participants treated through 48 months versus ADNI matched placebo data is consistent with a durable disease-modifying effect. The long-term safety profile of lecanemab was confirmed, with no new safety signals.

The Delirium Project—Advancing Prevention and Management in a Psychogeriatric Population

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Background: Delirium care is a complex yet essential part of supporting older adults living with dementia and/or mental health challenges. Early recognition and prevention can significantly improve outcomes for psychogeriatric inpatients, who are particularly vulnerable to delirium's adverse effects, including increased morbidity, prolonged hospitalization, and functional decline. Despite its prevalence, delirium remains under-recognized and undertreated in this population. The Geriatric Delirium Project was initiated to address these gaps through a comprehensive, multidisciplinary approach to delirium prevention, detection, and management, tailored to a psychogeriatric population.

Methods: The project was implemented in two geriatric inpatient units serving patients with complex neurocognitive and psychiatric conditions. To enhance delirium care and build capacity, four 12-hour Delirium Education Days and a follow-up session were held for all inpatient staff and evaluated using pre- and post- surveys assess changes in knowledge and confidence. The Confusion Assessment Method-Short Version (CAM-S) was adopted as the standardized screening tool for early detection. A multidisciplinary, integrated care pathway (ICP) was developed to guide prevention, detection, intervention, and discharge planning. Staff co-developed and implemented non-pharmacological prevention and intervention strategies, including orientation cues (clocks and calendars), sleep hygiene enhancements, sensory supports, patient and caregiver delirium brochures, and personally-valued activities aligned with patient preferences.

Results: All clinical staff completed the 12-hour education sessions, with pre- and post-survey showing improvements in staff knowledge and confidence with delirium identification and management. Staff reported the training was relevant and applicability to their daily practice. The CAM-S screening tool was fully integrated into the electronic medical records (EMR) system and the ICP supported consistent application of best practices across disciplines and into clinical workflows.

Distinguishing delirium in a psychogeriatric population presented challenges, as underlying cognitive and psychiatric symptoms often overlap with delirium features. As clinical awareness increased, the team anticipated an initial rise in suspected delirium rates, reflecting improved recognition rather than a true increase in incidence. Implementing new initiatives also posed practical challenges, including navigating internal procurement processes for equipment and balancing allied health capacity with clinical acuity. Despite these barriers, best practice champions and clinical scholars were driven by their dedicated commitment to improve patient care, applying agility through iterative approaches throughout the project. Change leadership was instrumental in sustaining engagement and momentum throughout the project. All thirty planned non-pharmacological strategies were implemented, and patient feedback was particularly positive regarding orientation aids.

Conclusion: The Geriatric Delirium Project demonstrates that a comprehensive, multidisciplinary and proactive approach to delirium prevention and management in a psychogeriatric population is both feasible and impactful. The project achieved high rates of staff engagement, strong uptake of evidence-based interventions, and positive feedback from staff and patients. Key success factors the importance of tailored education, the value of best practice champions and change leaders, and the need for adaptability navigating system-level constraints. This initiative offers a scalable model for improving delirium care across the dementia and cognitive health continuum and underscores the importance of sustained, system-level change for older adults with complex neuropsychiatric needs.

Early Indicators of Cognitive Decline from Eye Movements: Preliminary Results of a Multimodal Study

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Background: Emerging evidence suggests that alterations in speech patterns and eye movements may precede the clinical onset of neurodegenerative diseases such as Alzheimer's disease (AD). Early detection and intervention are critical for managing AD and potentially slowing its progression.

Objectives: This study aims to develop a non-invasive, cost-effective multimodal assessment system that integrates speech and eye-tracking data to identify early signs of cognitive impairment in older adults, especially outside of academic settings. The final system aims to operate on any computer with a microphone and a high-quality webcam.

Methods: Participants with mild cognitive impairment (MCI), early AD, and healthy controls (HC) undergo cognitive assessments using the National Alzheimer's Coordinating Centers Uniform Data Set 3 (UDS3) along with the computerized eye-tracking and speech assessment system every six months over an 18-month period. This assessment includes tasks such as visual and verbal (story) recall, reading aloud, picture description, fixation, and pro-saccade. For this project, eye movements were recorded using a Tobii eye tracker. Key features such as saccade velocity and accuracy, fixation duration, and linguistic complexity were analyzed to detect possible signs of cognitive changes.

Results: Preliminary results from the pro-saccade task, where participants shift their gaze to a peripheral target, are reported here. The cognitively impaired (CI) group (n = 6; 3 with MCI, 3 with AD; 3 females) had a mean age of 79.3 years and 14.7 years of education. Their Functional Activities Questionnaire (FAQ) scores were 4.7 at Visit 1 and 8.0 at Visit 2, while their Montreal Cognitive Assessment (MoCA) scores were 18.7 and 17.3, respectively. The HC group (n = 6; 5 females) had a mean age of 71.3 years and 16.7 years of education, with FAQ scores of 0 at both visits and MoCA scores of 28.0 (Visit 1) and 28.2 (Visit 2). The saccade task measured latency (time from stimulus onset to eye movement initiation), velocity (speed of the eye movement), duration (total time of the saccade), and saccadic error (deviation between the saccade endpoint and the stimulus target location).

No significant within-group differences were observed between Visit 1 and Visit 2 for either group. However, between-group comparisons revealed several differences. At Visit 1, the CI group exhibited significantly greater saccadic error than the HC group (p = 0.024, t-test) and showed a trend toward longer durations (p = 0.069, t-test). At Visit 2, the CI group demonstrated significantly lower saccade velocity (p = 0.034, t-test), longer durations (p = 0.026, Mann-Whitney), and greater saccadic error (p = 0.032, t-test) compared to the HC group.

Conclusion: These preliminary findings suggest that saccade-based metrics may be able to distinguish CI individuals from the HC group, supporting their potential as early, non-invasive indicators of cognitive decline. Ongoing analyses with a larger sample size will aim to validate these results, determine the benefits of adding speech-based data, examine longitudinal changes, and refine multimodal markers for early detection of cognitive impairment.

Reproductive Aging, Psychosocial Well-being, and Subjective Cognitive Decline: The Influence of Menopause Timing on Later-life Engagement and Quality of Life

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Background: Earlier menopause onset is linked to greater risk of cognitive and functional decline, key markers of dementia. However, less is known about how menopause timing may shape broader outcomes, like life engagement (LE) and quality of life (QoL). LE reflects the degree to which individuals remain involved and connected in their lives, while QoL captures emotional, physical, and social well-being. Both outcomes are indicators of resilience in aging and may be shaped by later-life cognition. Subjective cognitive decline (SCD), which may signal early-stage neurodegenerative disease prior to dementia, could contribute to the relationships between age at menopause and LE/QoL. Hormone therapy (HT) use may also influence these associations, given the potential of HT to support well-being during the menopause transition. This study investigated whether earlier menopause onset is associated with LE and QoL in later life and examined the role of SCD status among the relationships.

Method: Participants were postmenopausal females in the CAN-PROTECT study with baseline and annual follow up data over 2 years (n=538, mean age 64.3±7.4, menopause age: 9-66 years, 39.6% history of HT use). Age at menopause onset was modelled as a continuous variable. LE was measured using a validated subset of 11 items from the Inventory of Depressive Symptomatology Self Report (IDS-SR), with lower scores indicating greater LE. QoL was assessed using

the Quality of Life and Function Five-Domain Scale (QFS-5), with higher scores reflecting better QoL. SCD status was derived from the Revised Everyday Cognition Scale (ECog-II), with participants classified as SCD-positive if they endorsed a rating ≥2 on any ECog-II item. Linear and negative-binomial mixed-effects models examined associations between age at menopause and LE/QoL, adjusting for HT use, age, education, ethno-cultural background, with a menopause age*timepoint interaction term. A menopause age*SCD interaction term was also included to assess effect modification by SCD. Given that SCD could potentially be on the causal pathway between age at menopause and LE/QoL, exploratory mediation analyses examined whether SCD status partially explained these relationships.

Result: Earlier age at menopause predicted higher IDS-SR scores (b=0.33, 95%CI [0.14, 0.48], p=0.002) and lower QFS-5 scores (b=-0.17, 95%CI [-0.32, -0.02], p=0.03). These effects did not vary by study timepoint. However, the link between age at menopause and LE was stronger (interaction p=0.015) among those with SCD (b=0.08, 95%CI [0.002, 0.15], p=0.015) compared to those without SCD (b=0.02, 95%CI [-0.01, 0.05], p=0.183). In contrast, SCD status did not moderate the relationship between menopause onset and QoL. Mediation analyses also found no evidence that SCD status explained either association.

Conclusion: Earlier menopause onset was associated with lower life engagement and poorer quality of life in later life. These effects persisted over two years and were not explained by SCD status. However, participants with SCD showed a stronger link between earlier menopause and poorer LE, suggesting that perceived cognitive decline may amplify later functional impacts of reproductive aging. Findings highlight the importance of considering both menopause timing and perceived cognitive decline when evaluating resilience in female aging.

Age at Menopause and Cerebral Small Vessel Disease: A Cross-sectional Analysis from COMPASS-ND

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Background: Estradiol supports cerebrovascular health by reducing inflammation, regulating cerebral blood flow, and limiting the accumulation of Alzheimer disease (AD)-related proteins such as amyloid-beta and phosphorylated tau. Following menopause, estradiol levels decline, potentially contributing to vascular dysfunction and neurodegenerative processes. Early menopause has been associated with poorer cardiovascular and neurological outcomes, possibly due to an earlier reduction in estradiol levels. However, the relationship between early menopause and cerebral small vessel disease (CSVD), a common contributor to cognitive decline in older adults, remains understudied. Hormone therapy (HT), prescribed to supplement estradiol loss post-menopause, may influence cerebrovascular aging, though its impact is unclear. We investigated whether age at menopause was associated with CSVD burden in postmenopausal females and whether this association was moderated by HT use.

Method: Cross-sectional data were analyzed from 297 postmenopausal females enrolled in the COMPASS-ND study, a Canadian multisite observational cohort study involving adults aged 50-90 years. Participants spanned the neurocognitive continuum, including those who were cognitively unimpaired, and those with subjective cognitive decline, mild cognitive impairment, or dementia (including AD and vascular, frontotemporal, Lewy body, and Parkinson dementia). Age at menopause was modeled as a continuous variable. Imaging markers of CSVD were identified on structural magnetic resonance imaging according to the Standards for Reporting Vascular Changes on Neuroimaging 2 (STRIVE-2). A CSVD burden score (range: 0-4) was calculated based on the cumulative presence of deep cerebral microbleeds (1-point), lacunes (1-point), moderate-severe enlarged perivascular spaces in the basal ganglia (1-point), and a Fazekas white matter hyperintensity deep grade of 2-3 or periventricular grade of 3 (1-point). An ordinal logistic regression modeled the association between age at menopause and CSVD burden, adjusting for chronological age and race (white vs. non-white). Vascular risk factors were not included as covariates due to their potential role on the causal pathway. A menopause age*HT interaction term was included to assess effect modification of HT on the association between age at menopause and CSVD burden.

Result: Participants were 71.2±6.7 years old and reported menopause at 48.9±7.5 years (range: 26-72); 33.7% reported HT use. The average Montreal Cognitive Assessment score was 24.6±4.5, and the median CSVD burden score was 1. Earlier age at menopause was significantly associated with greater CSVD burden. Specifically, every 1-year earlier age at menopause was associated with 5% greater odds of being in a higher CSVD burden category (cOR=1.05, 95%CI [1.02, 1.08], p=0.001). There was no significant interaction between age at menopause and HT use with respect to CSVD burden (cOR=1.03, 95%CI [0.97, 1.10], p=0.29). HT use was not significantly associated with CSVD burden (cOR=1.21, 95%CI [0.78, 1.95], p=0.38).

Conclusion: Earlier age at menopause was associated with greater CSVD burden in postmenopausal females. This finding suggests that reproductive aging, as represented by menopause onset timing, may relate to cerebrovascular vulnerability in later life. Further investigation of estradiol-related mechanisms, including the potential role of HT, may help clarify how menopause influences vascular brain aging.

The Association Between Cascading Network Failure, APOE genotype, and Mild Behavioral Impairment in Older Adults

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Introduction: The cascading network failure model suggests that Alzheimer disease (AD) pathogenesis involves progressive degradation of functional networks in the brain, beginning with the posterior default mode network (DMN). At early stages of AD, the anterior DMN is hypothesized to temporarily compensate for posterior network failure, resulting in a transient increase in anterior DMN-posterior DMN functional connectivity. This effect is greater in APOE ε4 carriers. Mild behavioral impairment (MBI), characterized by later-life emergent and persistent neuropsychiatric symptoms, is a common behavioural prodrome of AD. However, the link between early cascade network failure and MBI is not well understood. We investigated: 1) cross-sectional associations between cascading DMN failure and prevalent MBI; and 2) longitudinal associations between cascading DMN failure and incident MBI.

Methods: Participants aged ≥50 years without dementia were from the Alzheimer's Disease Neuroimaging Initiative (ADNI) study. The cross-sectional sample comprised of 1020 participants (mean age 71.1±7.0 years, 52.9% female, 16.1% mild cognitive impairment [MCI] and MBI+, 4.0% MBI+ MCI-, 25.9% MCI+ MBI-, 54.0% MCI- MBI-). The longitudinal subsample included only MBI- participants at baseline (n=741), of whom 55.1% were female and 32.3% had mild cognitive impairment. The network failure quotient (NFQ) was quantified as the ratio of anterior-posterior DMN connectivity to within-posterior DMN connectivity. NFQ values were standardized, and greater values indicated greater network failure. MBI domain scores were derived from the Neuropsychiatric Inventory Questionnaire (NPI-Q) using a published algorithm. A participant was classified as having MBI if they had a non-zero score in at least two-thirds of their visits. We tested whether greater NFQ was associated with higher odds of MBI cross-sectionally using logistic regression, and higher hazard of incident MBI longitudinally using Cox proportional hazards regressions. All models adjusted for age, sex, education years, and MCI status and assessed effect modification by APOE ε4 carrier status.

Results: NFQ had a mean of 0.43 (SD=0.23, range=-0.21-1.32). Cross-sectionally, greater NFQ was not associated with higher odds of MBI (OR=0.92, 95% CI: 0.78-1.10, p=.36). However, over the mean follow-up period of 5.9 years (range=0.5-17.0 years) participants with greater baseline NFQ developed MBI at a faster rate (hazard ratio [HR]=1.20, 95% CI: 1.05-1.37, *p*=.008). The association of NFQ with incident MBI was modified by APOE ε4 status; carriers had a significantly greater hazard (HR=1.60, 95% CI: 1.26-2.02, p<.001) than non-carriers (HR=1.00, 95% CI: 0.84-1.20, p=.96).

Discussion: These results suggest that cascading network failure, as operationalized by NFQ, may precede and contribute to the development of MBI in AD. This relationship is amplified in the presence of the APOE ε4 allele. These findings align with the cascading network failure model in AD pathogenesis. MBI may serve as a clinically meaningful marker of early AD-related network dysfunction, particularly among APOE ε4 carriers and prior to dementia. Future research should incorporate AD biomarkers such as amyloid-beta, phosphorylated tau, and synaptic markers to further elucidate the pathways linking network failure and MBI.

Implementation of Biomarker First Pathway - BioMIND

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Introduction: Biomarkers for amyloid and tau pathology have transformed Alzheimer's Disease (AD) management, offering opportunities for pathological confirmation and targeted therapies. With growing evidence of their diagnostic utility, real world clinical data is needed to integrate these into routine clinical care. This study aimed to assess the feasibility and effectiveness of a triage-oriented decision support tool calibrated to the workflow, populations, and diagnostic infrastructure of the Canadian health system

Methods: The BioMIND study is a prospective, observational study conducted at a tertiary memory clinic. A nurse-led screening tool was developed to identify patients with a high pre-test probability of AD pathology using referral information provided by primary care physicians. These patients were offered participation in the study involving biomarker assessment prior to seeing the specialist.

Participants were between 55 and 80 years old and either had a diagnosis of mild cognitive impairment (MCI) or showed amnestic changes on the MoCA if not yet formally diagnosed. A study partner was required for participation. Individuals were excluded if their cognitive impairment was suspected to be due to a cause other than Alzheimer's disease, or if they had significant neurological, psychiatric, or medical conditions, that may be impacting cognition.

Patients were screened from the specialist's clinic's waiting list. Eligible individuals received cognitive testing, CSF analysis, and amyloid PET scans before seeing a specialist in dementia (Group A - "biomarker-first" approach). Their results were then compared to the standard pathway, where biomarkers are obtained after specialist assessment (Group B - biomarker after specialist)

Results: Out of 390 referred patients screened in one year, 82 (21%) met eligibility criteria. Major exclusion factors included age <50 or >80 (25%), medical comorbidities (21%), MoCA scores <18 (13%), and insufficient referral information (9%). Notably, implementation of the screening tool reduced wait times by an average of 413 days.

In this study of 100 participants (n=50 per group), Group A received biomarker results significantly earlier than Group B, with mean times of 250 and 712 days, respectively. Group A had a mean age of 65 years, while Group B had a mean age of 70 years. Cognitive performance was comparable between groups (MoCA ~22; MMSE 26-27), as were Geriatric Depression Scale scores (~2.75) and functional ability (ADCS-MCI-ADL ~43). CSF-PET concordance was high in both groups (98.5%). CSF biomarkers consistent with Alzheimer's disease were detected in 82% of Group A and 78% of Group B. One low-risk adverse event was reported in Group A; no adverse events were reported in Group B.

Conclusion: Using a nurse led decision support tool is feasible to identify patients who may be eligible for early biomarker testing. This tool markedly shortened diagnostic wait times without compromising the accuracy of pre-test predictions for AD pathology. BioMIND generates real-world evidence on the effectiveness of AD biomarkers and underscores the need for further refinement of pre-test prediction methods. Further studies aimed at integrating patient and provider input are necessary for the wide-spread implementation of biomarkers into routine care.

The Geriatric Telehealth Program at the Glenrose Rehabilitation Hospital

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Background: The Glenrose Rehabilitation Hospital (GRH) has been providing geriatric telehealth consultations to patients in Fort McMurray for more than a decade. Dr. Jean Triscott provides the consultations and follow-ups in collaboration with a remote interdisciplinary team in Fort McMurray. This program is one of only a few geriatric telehealth programs in Alberta, and at times the only one.

Objective: We will describe the GRH Telehealth program.

Methods: This was a review of electronic medical records of patients seen in the GRH Geriatric Telehealth Program. We included patients 65 years or older seen from November 1, 2019 to June 30, 2024. Data extracted included age, sex, location, reason for referral, post-consult diagnosis, and various clinical examinations. Descriptive statistics was used to summarize the data.

Results: The telehealth program saw 69 unique patients. The ages ranged from 65 to 92 years with a mean of 76.6 years (SD: 7.1 years; median: 76 years). 58% were females. 85.5% (59/69) of patients were from Fort McMurray (about 430 Km from GRH); 4.3% (3/69) were from Fort Chipewyan (about 728 Km from GRH); six patients were from other rural areas (1/69 each area) 144 Km to 417 Km from GRH; one was from Edmonton. 89.9% (62/69) of records indicated reasons for referral; of these reasons, 90.3% (56/62) related to cognitive impairment; only 4.8% (3/62) of patients had mobility or movement indicated as a reason for referral. 97.1% (67/69) of patients had a post-consult diagnosis; of these diagnoses, 95.5% (64/67) pertained to dementia or cognitive impairment; only 3.0% (2/67) of patients had depression indicated. 68.1% (47/69), 33.3% (23/69), and 20.3% (14/69) had brain CT Scans, brain MRIs, or both, respectively. MMSE scores ranged from 5 to 30 with a median of 24. GDS score ranged from 0-9 with a median of 3. Most of the patients (82.6%, 57/69) were seen by or referred to occupational therapists; other healthcare providers or referrals include those to geriatric psychiatry, audiology, home care, Alzheimer's society, orthopedics, physiotherapy, and ophthalmology.

Conclusion: The GRH Geriatric Telehealth Program has provided remote consultations to geriatric patients in rural areas, with most patients having cognitive issues.

A Cross-disciplinary Exploratory Survey Evaluating Hospital Staffs' Knowledge about Pain Management for People Living with Dementia in Two Acute Care Hospitals

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Background: Acute pain in people living with dementia (PLWD) is often under-recognized and undertreated due to cognitive impairment, communication barriers, and inconsistent assessment. The APOE ε4 allele, common in Alzheimer's disease, is linked to increased pain sensitivity and neuroinflammation, suggesting biological vulnerability. Poor pain management in PLWD contributes to prolonged hospital stays and complications. One contributing factor is insufficient knowledge or misconceptions among healthcare professionals (HCPs), which this study aimed to explore.

Objectives: To assess HCPs' knowledge and beliefs regarding acute pain in hospitalized PLWD using the Zwakhalen

Knowledge and Beliefs about Pain in Elderly with Dementia (KBPED) questionnaire. Secondary goals included examining pain assessment practices and tool usage.

Methods: A cross-sectional electronic survey was conducted from December 2024 to March 2025 at two acute care hospitals in Edmonton, Alberta. Eligible participants included HCPs across disciplines, physicians, nurses, allied health professionals, and healthcare aides, working in the hospital's inpatient setting. Based on prior survey literature and expected number of total possible survey respondents, a sample size of 100 was used.

A 28-question REDCap survey which incorporated validated items from the KBPED, was disseminated to all HCPs at the two sites via email, and poster advertisement (which contained a QR code and the survey link). Data was analyzed using SPSS.

Results: Of 212 responses received, 204 were included in the final analysis. Respondents were predominantly female (over 80%) and skewed towards early- to mid-career professionals, with 34% having fewer than five years of experience. Nurses made up 59% (n=121) of respondents, followed by physicians (20.5%, n=42), with General Internal Medicine being the most common specialty.

Overall, participants demonstrated good baseline knowledge and rejected common pain-related myths. However, there was interprofessional discrepancy about the adequacy of pain assessments: while 66.7 % (n=28) of physicians felt pain in the elderly is inadequately assessed, 67 % (n=81) of nurses believed pain was adequately addressed.

Only 38% (n=46) of nursing staff felt sufficient attention was given to pain in PLWD, with 20% being unsure. Although most respondents endorsed the usefulness of pain assessment tools (81% physicians, 89.2% nurses)), only 38.1% (n=16) of physicians and 69.4% (n=84) of nurses reported using a pain scale. Rehabilitation and support staff were also surveyed, but subgroup sizes were too small for reliable analysis.

Conclusion: This study highlights interprofessional and intraprofessional variability in perceptions of pain management for hospitalized PLWD. The discrepancy between physicians and nurses reflects a lack of unified approach, while the divided nursing responses, rarely documented in prior literature, suggest uncertainty in recognizing pain in PLWD. Despite strong support for pain assessment tools, underuse persists, especially among physicians.

The early-career profile of many respondents signals an opportunity for early, targeted education. Furthermore, emerging research on APOE ε4-related pain sensitivity underscores the need for biologically informed training and standardized observational tools. Bridging these gaps is essential to improving acute pain care in hospitalized older adults with dementia.

From Prevention to Partnership: Adapting Therapeutic Falls in Dementia Care

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Background/Objectives: Falls are a leading cause of injury, hospitalization, and functional decline in older adults. It is estimated that older adults with dementia fall up to eight times more frequently than those living without dementia. Traditional fall prevention strategies often emphasize safety through restrictive mobility practices, which can lead to deconditioning, social isolation, and reduced quality of life. In dementia care, this risk-averse approach may further undermine personhood and autonomy.

Therapeutic Falls (www.therapeuticfalls.ca) is a framework that proposes falls are not something to be avoided at all costs and provides patients with the opportunity to participate in higher-risk mobility activities in collaboration with their care teams. We introduced a novel adaptation of Therapeutic Falls to a dementia rehabilitation setting, grounded in the philosophy of a palliative approach to falls that supports a shift in the falls narrative for dementia care - viewing falls not as failures of care, but as manageable risks that can be navigated collaboratively.

The objective is to support autonomy and dignity for patients, while equipping the interprofessional team with tools to engage Substitute Decision Makers (SDMs) and document risk as part of an integrated care plan.

Methods/Overview: The project was implemented in June 2024, on a 17-bed secure inpatient Specialized Dementia Unit (SDU) at Toronto Rehab, University Health Network. Patients are admitted to address behavioral and psychological symptoms of dementia; the average length of stay is 60 days.

Using co-design principles, providers, leaders and support staff participated in workshops and small-group sessions with a focus on the ethical and practice elements of falls and immobility, as well as facilitated discussions about autonomy, risk, and safety as a value. Implementation followed a Plan-Do-Study-Act (PDSA) framework, and evaluation included workshop participation, falls rate (with and without harm), and number of patients on the pathway per month. Semi-structured interviews with providers and SDMs explored perceptions of risk, autonomy, and patient and caregiver experience.

Results: In the first year of implementation, 36% (n=32) of all patients admitted to the SDU have been on the Therapeutic Falls pathway. There has been no increase in the number of falls or falls with harm. 95% of staff participated in training and providers (n=15) report reduced care burden and increased confidence facilitating risk-related discussions. SDMs report improved continuity of care and greater respect for patients' autonomy and preferences.

PDSA cycles led to several refinements: renaming the pathway to "*Distant Supervision"* to align with existing terminology, integrating the concept into the SDU Welcome Package, and expanding its application to all mobility rather than specific, designated activities.

Conclusion: Implementing a risk-tolerant approach to mobility in dementia care promotes autonomy and shared-decision making - without increasing fall-related harm. Therapeutic Falls, when adapted thoughtfully, offers a structured and practical framework for aligning clinical practices with the values and preferences of patients and their SDMs. This initiative joins the growing call in progressive dementia care to embrace controlled risk to uphold dignity and foster engagement, with broader application beyond hospital-based environments.

The Cross-sectional Association Between Enlarged Perivascular Spaces and Mild Behavioral Impairment in Older Adults with α-Synucleinopathies

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Background: Insufficient waste clearance through the perivascular system may contribute to the accumulation of pathological α-synuclein aggregates, leading to α-synucleinopathies such as Parkinson disease (PD) and dementia with Lewy bodies (DLB). Disruption of perivascular clearance may be associated with radiologically visible enlarged perivascular spaces (EPVS). Later-life emergent and persistent neuropsychiatric symptoms, i.e., mild behavioral impairment (MBI), along with EPVS, are associated with a greater risk for dementia. Thus, in adults with α-synucleinopathies, we aimed to determine whether EPVS were associated with MBI.

Methods: Participants were older adults with α-synucleinopathies (PD, PD-dementia, and DLB) from the Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) study. EPVS burden in the midbrain (range 0-1), basal ganglia (range 0-4), and centrum semiovale (range 0-4) were assessed using a validated visual rating scale applied to T2-weighted and T2-FLAIR magnetic resonance imaging; regional scores were summed to calculate the total EPVS burden. MBI was assessed using the informant-reported MBI Checklist (MBI-C) with a cut-point of >5 for MBI presence. Cognition was assessed with the Montreal Cognitive Assessment (MoCA). Multivariable logistic and zero-inflated negative binomial regressions modelled the associations between EPVS and MBI presence and severity, respectively, adjusting for age, sex, and education, with an EPVS*MoCA score interaction term to assess moderation by cognition.

Results: The total sample comprised 81 participants (mean age=73.0 years, [SD=8.8, range=54.8-90.2], 35.8% [n=29] female, mean education=16.1 years [SD=3.8, range=5.0-25.0], mean MoCA score=24.4 [SD=5.1, range=11.0-30.0], median EPVS total score=5.0 [IQR=4.0-6.0]).

Every 1-point increase in EPVS total score was associated with 1.65 times (95%CI: 1.05-2.59, p=0.03) greater odds of MBI+ status. For EPVS regions, those with higher centrum semiovale scores had greater odds of MBI (aOR=2.21, 95%CI: 1.07-4.57, p=0.03); however, this association was not observed for basal ganglia (aOR=1.52, 95%CI: 0.61-3.76, p=0.37) or midbrain EPVS (aOR=2.78, 95%CI: 0.80-9.60, p=0.11). These associations were not moderated by MoCA score.

Every 1-point increase in the centrum semiovale EPVS score was associated with a 1.46-fold (95%CI: 1.07-2.00, p=0.02) greater MBI-C total score. This association was moderated by MoCA score, such that the positive association between centrum semiovale EPVS and MBI-C total score strengthened as MoCA score increased (EPVS centrum semiovale*MoCA b=1.07, 95%CI: 1.01-1.13, p=0.03). However, there were no associations between total (b=1.17, 95%CI: 0.97-1.43, p=0.10), basal ganglia (b=1.11, 95%CI: 0.72- 1.71, p=0.63), or midbrain (b=1.47, 95%CI: 0.80-2.70, p=0.22) EPVS scores and MBI-C total score, with no effect modification by MoCA score.

Discussion: Older adults with α-synucleinopathies and greater total and centrum semiovale EPVS burden were more likely to have MBI. Participants with a greater burden of centrum semiovale EPVS also had more severe MBI symptoms, and this relationship was stronger with less cognitive impairment. These findings suggest that early impaired perivascular waste clearance, particularly in the centrum semiovale, may contribute to emergent and persistent behavioural symptoms in persons with α-synucleinopathies. That this association was stronger among individuals with less impaired cognition may reflect a stage in which the contributions to behavioural impairment are more discernible, prior to the development of overt cognitive impairment.

I WONDER: Art+Care+Dementia - A Contemporary Art Contribution to 'Practice' Discourse

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In the final months of life, Cathy Busby's late-husband, Garry Neill Kennedy, would frequently say, "I wonder, wonder…" and drift off. Garry Kennedy was a renowned conceptual artist, former long-time President of the Nova Scotia College of Art and Design, and was diagnosed with dementia in 2016. The book, I WONDER: Art+Care+Dementia (Art Metropole, 2025) circles around the idea of wonder in narrating each of their life stories, their life together, and how they went through Garry Kennedy's dementia decline—inside and outside the healthcare system, supported by friends, family, and their continued artmaking.

Creative Dementia Care - Maintaining Calm and Dignity in the Institutional Setting

In the last care facility where Garry lived, Cathy started a floor-to-ceiling wall-text painting to encircle his large bathroom and read I WONDER. She painted the walls the white of their home and the lettering would have been an off-white, a shade borrowed from his artwork. In his final days, as she taped out the letters in the process of making the painting, Garry would hold the level and pass the measuring tape or pencil from his wheelchair. She felt it was calming and meaningful for both of them to have this project on the go. Her intention was also to maintain his dignity by continuing to make art, like they always did.

Remembering and Keeping it Going

This artist book outlines Garry's Remembering Names, a list-making work that he began in the early 1970s, that he returned to during his dementia years; his vigorous final 18 Drawings; and his Arrangements, that Cathy photographed, documenting his selected organizing of his belongings. In the book, these are followed by Quarantine Countdown, Cathy's daily ritual of painting 1/14th of Garry's room in long-term care during a 14-day COVID-19 quarantine, and I WONDER, a wall painting Cathy started in the bathroom at Parkview care facility in Vancouver, later fully realized as a memorial wall painting at Art Metropole in Toronto.

Context and this Strategy through the Lens of Art and Medicine

In order to complement these works and assist in creating a broader platform for discussion, Mandy Ginson, visual art curator, brings her interpretive perspective on both Garry and Cathy's artworks related to memory, meaning-making, and to care. Dr. Melissa Andrew, Professor of Medicine (Geriatrics) and Kathryn Allen Weldon Chair in Alzheimer's Research at Dalhousie University, contributed a text that will be of interest to healthcare professionals concerned with institutional innovation for people with dementia, and thus provide an opening for discussion about new ways to support, tell stories about, and re-imagine lives, before and after diagnosis. Dr. Andrew gives a family friend and geriatrician's analysis of Garry and Cathy's process of 'creative dementia care'.

This artist book can be seen as a case study and research tool concerning art in institutions of care. It has the potential to be a catalyst for discussion of how individual history, values, dignity and personhood can come to the fore, even in the midst of severe cognitive impairment.

Sex-Specific Network Analyses of Alzheimer's Disease Risk Factors Across Cognitive Trajectories

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Background: As global dementia prevalence rises, identifying modifiable risk factors for Alzheimer's disease (AD) is critical. While age and APOE ε4 status remain key non-modifiable contributors, risk for AD is influenced by sex-specific biological, behavioral, and socio-cultural factors. Females not only live longer but may experience heightened vulnerability to AD, especially among APOE ε4 carriers. Yet, the literature on sex differences in AD risk remains inconsistent, often focusing on individual risk factors rather than their interactions. This study applies network analysis to evaluate interrelated AD risk factors among cognitively healthy and impaired older adults, utilizing sex-disaggregated analyses.

Methods: Data were pooled from three harmonized Canadian aging and dementia cohorts: ONDRI, CCNA, and PREVENT-AD. Participants were categorized into four groups based on sex and diagnosis: healthy control females (HCF), cognitively declined females (CDF), healthy control males (HCM), and cognitively declined males (CDM). Demographics, clinical, cognitive, lifestyle, and genetic risk variables—aligned with the Lancet Commission's dementia risk model—were analyzed. Network models were constructed for each group using mixed graphical models and compared using network invariance and global strength tests. Centrality metrics (strength, betweenness, closeness) identified influential risk factors.

Results: A total of 896 older adults were included (486 HC; 410 CD). Demographic comparisons revealed CDF were older than HCF and had greater APOE ε4 allele presence, more smoking history, hearing loss, and lower MoCA scores. CDM were older than HCM, with worse sleep, cognitive scores, and higher APOE ε4 presence. Few differences were observed between HCF and HCM, although males showed higher systolic blood pressure, BMI, and worse memory scores.

Network analyses revealed distinct sex-specific structures and central risk factors. In HCF, maternal/paternal family history, smoking, and falls were most central; in HCM, APOE ε4 status and paternal history were key. Among cognitively declined individuals, in the females SBP, diagnosis status, and MoCA scores were key central risk factors to the network, while the male network centered on MoCA and memory scores. Network invariance tests indicated statistically significant differences in structure between HCF and CDF ($p < 0.0001$) and between HCM and CDM ($p = 0.008$). Females with cognitive decline demonstrated significantly weaker global connectivity compared to healthy controls, suggesting disruption of protective interconnections. No significant structural differences were observed between sexes in the healthy group, but female CD networks had stronger overall connectivity than male CD networks ($p = 0.036$).

Conclusions: This is the first known application of network analysis to examine sex-specific AD risk factors across healthy and impaired groups. Findings highlight unique patterns of interconnected risk in males and females, suggesting different mechanistic pathways to cognitive decline. For females, vascular and genetic factors (e.g., APOE ε4) may exert greater influence, while in males, cognitive scores may be more central. These results support the utility of sex-stratified network approaches and emphasize the importance of personalized dementia prevention strategies grounded in risk factor interdependencies. Future work will incorporate MRI-based biomarkers as a lens to directly measure brain health, enabling validation of these sex-specific risk networks with structural and functional neuroimaging.

Associations of sTREM2 with Cognition and Behaviour in Dementia-Free Older Adults Stratified by Amyloid Beta Status

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Background: Alzheimer disease (AD) is a progressive neurodegenerative condition that manifests along a continuum of clinical stages involving both cognitive and behavioural changes prior to dementia onset. Mild Behavioural Impairment (MBI), characterized by later-life emergent and persistent neuropsychiatric symptoms (NPS), is increasingly recognized as a marker of elevated dementia risk. Soluble Triggering Receptor Expressed on Myeloid Cells 2 (sTREM2) is a microglia-specific inflammatory biomarker implicated in AD pathology, showing dynamic expression across the disease trajectory. TREM2 activates intracellular signaling pathways that enhance microglial survival and phagocytic activity, supporting amyloid-β 1-42 ($A\beta_{42}$) degradation. While sTREM2 levels have been associated with cognitive decline, the relationship between sTREM2 and behavioural symptoms, particularly MBI, remains unexplored.

Objectives: Investigate associations between CSF sTREM2 levels, cognitive status, and behavioural status stratified by $A\beta_{42}$ status. Investigate the potential moderating effect of sex on the associations between CSF sTREM2 levels and cognitive and behavioural status.

Methods: Participants (n=703) from the Alzheimer's Disease Neuroimaging Initiative (ADNI) with available CSF sTREM2 and $A\beta_{42}$ data were included. Behavioural status was derived from the Neuropsychiatric Inventory Questionnaire (NPI-Q) and defined by symptom emergence after age 50 and persistence across two consecutive visits, categorizing individuals into noNPS or MBI groups. Cognitive statuses were normal cognition (NC) or mild cognitive impairment (MCI). sTREM2 levels were log-transformed, and logistic regressions modelled associations between sTREM2 and cognitive or behavioural outcomes stratified by $A\beta_{42}$ status. The cognitive model was adjusted for covariates relating to demographics, genetics, and behaviour, with a secondary model not adjusting for behaviour; the behavioural model adjusted for the same covariates in addition to cognition and NPI-Q source. Models also assessed the potential moderating effect of sex on associations between sTREM2, and cognition/behaviour.

Results: Mean participant age was 72.9±6.9 years (44.2% female, 62% with MCI). Among $A\beta_{42}$+ individuals (n=348), higher CSF sTREM2 levels were not significantly associated with MCI status (OR: 1.45, 95%CI [0.86-2.47], p=0.17) but were associated with significantly greater odds of MBI (OR: 1.63, 95%CI [1.04-2.58], p=0.04). Among $A\beta_{42}$+ individuals in the secondary cognitive model not adjusting for behaviour, higher CSF sTREM2 levels were associated with significantly greater odds of MCI (OR: 1.74, 95%CI [1.06-2.92], p=0.03). Among $A\beta_{42}$- individuals (n=355), higher sTREM2 levels were not associated with MCI status (OR: 1.04, 95%CI [0.67-1.61], p=0.86) or MBI status (OR: 1.19, 95%CI [0.71-2.03], p=0.51). Sex did not moderate the association between sTREM2 levels in the $A\beta_{42}$+ group and odds of MCI (β=0.63, 95% CI [-0.35, 1.62], p=0.21) or MBI (β=0.34, 95% CI [-0.56, 1.27], p=0.46).

Conclusion: Elevated CSF sTREM2 levels are associated with cognitive and behavioural symptoms in Aβ42+ dementia-free older adults. These findings suggest sTREM2 may serve as a dual-domain biomarker of early AD pathophysiology. Our findings support prior research linking elevated sTREM2, indicative of microglial activation, to cognitive impairment in the presence of amyloid pathology, particularly during MCI. Notably, our study suggests behavioural symptoms may be an early clinical sign of neuroinflammatory processes, potentially preceding or accompanying cognitive decline. Longitudinal research is needed to clarify the temporal relationship between sTREM2, neuroinflammation, and preclinical AD, guiding early detection and targeted immunotherapies.

The Role of Cognitive Reserve in Everyday Functioning Among Cognitively Normal Older Adults

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Background: Cognitive reserve (CR) is thought to buffer against the clinical manifestations of neurodegenerative disease in preclinical stages, helping preserve cognitive function despite underlying brain pathology. However, less is known about the relationship between CR and complex functional abilities, defined as the capacity to independently perform complex activities of daily living (ADL) -especially in cognitively normal older adults. Investigating how CR relates to different aspects of functional performance may help identify protective factors that promote independent living in aging populations.

Methods: We analyzed cross-sectional data from 1,522 cognitively normal older adults (mean age: 64.8; 80.9% female) from the CAN-PROTECT study. A validated composite CR score was derived from three components: 1) total years and highest level of education; 2) occupational complexity; and 3) engagement in cognitively stimulating personal activities. Higher scores indicate greater CR. Functional ability was measured using the Standard Assessment of Global Everyday Activities (SAGEA) scale, with a composite ADL score calculated across subdomains of: 1) cognitive ADL (e.g., memory, attention); 2) applied cognitive ADL (e.g., navigation, planning); and 3) instrumental ADL (e.g., finances, housework), to capture overall ability to perform complex tasks. Higher scores indicate greater ADL impairment. Zero-inflated negative binomial models examined the association between CR score and overall performance on complex ADL, adjusting for age, sex, and standardized score from a broad battery of neuropsychological testing. Separate models were then fitted for each SAGEA subdomain to assess domain-specific effects. Additional models tested the independent contribution of each CR component to functional outcomes.

Results: Overall, higher CR was significantly associated with better functional ability. Specifically, a one-unit increase in CR was associated with 56% lower composite ADL scores (i.e., better function: incidence rate ratio [IRR]=0.44, 95%CI: 0.25-0.78, p=0.005). For ADL subdomains, a one-unit increase in CR was significantly associated with 46% lower cognitive ADL scores (IRR=0.54, 95%CI: 0.31-0.94, p=0.028) and 63% lower applied ADL scores (IRR=0.37, 95%CI: 0.18-0.74, p=0.005). The association of CR with instrumental ADL was in the same direction but not-significant (IRR=0.54, 95%CI: 0.23-1.26, p=0.152). When examining individual CR components, education showed the strongest and most consistent association with lower scores across all ADL subdomains: cognitive ADL (IRR=0.55, 95%CI: 0.39-0.77, p<0.001), applied cognitive ADL (IRR=0.44, 95%CI: 0.28-0.69, p<0.001), and instrumental ADL scores (IRR=0.56, 95%CI: 0.32-1.00, p=0.054). The occupation component was significantly associated with the applied cognitive ADL domain only, with higher occupational complexity linked to better function (lower ADL score: IRR=0.55, 95%CI: 0.35-0.86, p=0.008). No significant associations were observed with the personal activities component.

Conclusion: Findings highlight the important role of CR in supporting complex functional abilities in cognitively normal older adults. Higher cognitive reserve, particularly driven by educational attainment, was associated with better performance across multiple domains of daily functioning. These results suggest that enhancing CR may be a promising avenue to promote functional independence and healthy aging, even in the absence of cognitive impairment.

Effects of Age, Sex, and APOE Genotype on Clinical Interpretation of Plasma p-tau217 in Alzheimer's Disease

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Background: Phosphorylated tau at threonine 217 (p-tau217) has become the leading biomarker for Alzheimer's Disease (AD) diagnosis and its increasing levels are associated with cognitive decline and brain atrophy linked to elevated amyloid-β (Aβ) pathology. However, our understanding of the mechanisms affecting the concentrations of plasma p-tau217 in older-aged cognitively unimpaired (CU) individuals remains limited. Moreover, AD biomarkers are known to be influenced by non-modifiable AD risk factors of AD such as age, sex, ethnicity, apolipoprotein E epsilon 4 (APOE-ε4) as well as other

covariates including renal disease, cardiovascular disease, body mass index and hypertension. Therefore, to confidently interpret plasma p-tau217 levels for the biological diagnosis of AD, particularly in its preclinical stage, we need to understand how these risk factors relate to plasma p-tau217 in the general population. In this study, we investigated the effects of age, sex and APOEe4 genotypes on plasma p-tau217 in a large cohort of amyloid-negative (A−) CU older adults and examined how these factors influence plasma p-tau217 test interpretation within this population.

Methods: 360 EDTA plasma samples of amyloid PET-negative healthy subjects from Australian Imaging Biomarkers and Lifestyle (ABIL) were analyzed using the AL Zpath pTau 217 v2 assay on a single Quanterix HD-X SIMOA Analyzer Platform at Neurocode, Bellingham, WA, USA, and BC Neuroimmunology Lab Vancouver, B C, Canada. The plasma p-tau217 concentration was classified as negative, intermediate, or positive based on previously defined cut-offs (≤ 0.34 ng/L for negative, 0.35-0.62 ng/L for intermediate, and ≥ 0.63 ng/L for positive). The cohort was age-stratified into <75 years and ≥75 years. The correlation between plasma p-tau217 results and age, sex, and ApoE ε4 carrier status were modeled using multinominal logistic regression.

Results: Participants had an overall mean age of 72.5 ± 5.2 years, with an average age of 71.6 ± 5 years for females and 73.8 ± 5 years for males. Of the total sample, 235 participants were younger than 75 years, and 125 were 75 years or older. Regarding APOE ε4 genotype, 276 participants were non-carriers, 65 were carriers, and 19 had unknown carrier status. Based on plasma p-tau217 levels, 319 participants were classified as negative, 35 as intermediate, and 6 as positive.

Multinomial logistic regression analysis showed that age was a significant predictor of test results (p = 0.027), while sex was narrowly non-significant (p = .092), and APOE ε4 carrier status did not significantly contribute to the model (p = .834).

In the comparison between positive and negative test results, none of the predictors were statistically significant. However, in the comparison of intermediate vs. negative results, age category emerged as a significant predictor (p = .008), with an odds ratio of 2.713, indicating that older participants were significantly more likely to be classified as intermediate rather than negative.

Conclusion: Age was a significant factor associated with plasma p-tau217 results, specifically increasing the likelihood of intermediate results compared to negative. Neither Sex nor APOE ε4 status show significant associations, although sex may have a modest effect that warrants further investigation. These results demonstrated the influence of aging on biomarker profiles even in the absence of cognitive impairment or confirmed disease.

The Clinical Utility of Plasma p-tau217 as a Tool for the Biological Diagnosis of Alzheimer's Disease, A Real-World Experience

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Background: The diagnostic landscape of Alzheimer's disease (AD) has undergone a major transformation, driven by a shift toward biomarker-based approaches. This shift is reflected in the 2024 Revised Criteria for the Diagnosis and Staging of AD by the Alzheimer's Association, which now supports diagnosing AD based solely on biomarkers. According to these criteria—based on the amyloid (A)/tau (T)/neurodegeneration (N), or AT(N), framework—a diagnosis of AD can be made based on positivity for either amyloid ("A") or phosphorylated tau ("T"), detected through PET imaging, cerebrospinal fluid (CSF), or plasma biomarkers such as p-tau217. Plasma p-tau217 has emerged as a leading biomarker capable of distinguishing AD from other dementias and tauopathies, with diagnostic performance shown to be comparable to that of CSF biomarkers and PET imaging. In several clinical and analytical validation studies, we demonstrated that plasma p-tau217 offers enhanced clinical performance for diagnosing AD. In this report, we present a series of plasma p-tau217 measurements obtained using a clinical laboratory diagnostic method for the biological diagnosis of AD.

Methods: Between 21 May 2024 and 9 June 2025, we received 451 EDTA plasma at BC Neuroimmunology lab, Vancouver, BC for testing plasma p-tau217. Plasma p-tau217 levels were measured using the ALZpath p-tau217 assay on the Quanterix HD-X Simoa platform. The ALZpath p-tau assay was comprehensively validated in our laboratory, as previously reported. Clinical diagnoses were obtained through communication with referring physicians, and demographic data were collected from test requisition forms. The cohort was stratified by age into four groups: younger than 65, 65-74, 75-84, and 85 years or older. Data analysis was performed using SPSS version 31

Results: A test result of = 0.34 ng/L is negative, a test result of ≥ 0.63 ng/L is positive, and a test result between 0.35 and 0.62 ng/L is considered intermediate. A total of 451 samples (Female: 237) were measured for plasma p-tau217. The average age of the samples was 67 ± 14 years. Of these, 194 samples were positive (Female = 90), 50were intermediate (Female = 27), and 207 were negative (Female = 120) for plasma p-tau217. There was a significant association between age and test results (p= <0.001). Individuals aged

20-64 had a higher number of negative results (n = 149) and fewer positive results (n = 36). In contrast, the 75-85 age group showed substantially more positive results (n = 88) and fewer negative results (n = 19). The 85+ age group also trended toward more positive results (n = 17) compared to negative results (n = 2).

Conclusion: The ALZpath plasma p-tau217 assay is a precise laboratory method for measuring plasma p-tau217. In this study, the assay identified 149 referred cases as positive when used in a clinical diagnostic laboratory setting. We also found a significant age-related increase in positive test results, consistent with progressive biomarker changes in older populations. We are conducting further clinical validation to evaluate its performance in real-world conditions and to support its potential as a best-in-class laboratory test for the biological diagnosis of AD.

Evaluating Dual-Task Costs and Cognition in Participants with Long COVID Brain Fog

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Background/Objectives: Long COVID is a recognised multi-organ condition occurring following a COVID-19 infection. Gait changes have been reported post COVID. However, current published studies are small (12 participants) and only evaluated usual walk.

This study evaluates dual-task walking costs in those with subjective complaints of ongoing brain fog from long COVID, and examines any association between dual-task gait costs and objective cognitive function.

Methods: Participants aged 20-50 years with subjective symptoms of Long COVID brain fog were recruited between December 2024 and June 2025. Baseline evaluation included medical history, objective cognitive evaluation (Montreal Cognitive Assessment (MoCA), and Cognigram®) and gait analyses. The MoCA is a validated tool differentiating normal, mild cognitive impairment (MCI) and dementia. It consists of a 30-point test looking at different domains of cognitive function. MoCA normal is ≥26/30 (corrected for formal education <12 years). Cognigram® is a computerised card-based test validated in concussion, MCI and Alzheimer's disease. It consists of 4 tasks: 2 tasks assessing learning and working memory; and 2 tasks assessing psychomotor function and attention. Results are calculated with age and sex match, and presented as both absolute scores as well as percentile. Gait was evaluated using a 6m zeno walkway system with three passes of the mat averaged for each task (usual walk, dual tasks 1 and 2). Usual walking was walking while not talking, at their usual pace. Dual task 1 (RL) was saying random letters of the alphabet aloud while walking. Dual task 2 (ML) was random letters of the alphabet aloud, but in time to a metronome set a one click/second. Dual-task costs were calculated as an increase in coefficient of variation under dual-task demands for stride length, stride time and stance time. These were compared to cognitive testing results form the same day, using Pearson correlation calculations.

Results: 94 participants were evaluated for baseline dual-task walking cost. 69/94 females, average age 40.7 (21-50 years). One participant used a walker, and one a cane for their walking tasks, and the remaining were independently mobile. Dual-task cost for stride length, stride time and stance time strongly correlated ($p<.001$) between the RL and ML tasks. MoCA score strongly correlated ($p<.001$) with dual task cost 1 (RL), but not with dual task 2 (ML). MoCA word fluency was a challenge for many participants, but did not appear to correlate with dual task costs. The Cognigram ® learning task only correlated with MoCA total (<.001), MoCA word fluency ($p<.05$), and RL stride length cost ($p<.05$). However, the Cognigram ® psychomotor speed and attention tasks correlated with all RL dual-task gait cost parameters ($p<.013$), as well as MoCA word fluency and total score ($p<.001$), but not with ML.

Conclusions: Participants reporting Long COVID brain fog have measurable dual-task walking costs that are associated with scoring on objective cognitive tests. It appears the RL dual-task costs are most strongly associated with cognitive domains of psychomotor function and attention over working memory and learning. Surprisingly, the ML dual-task costs did not correlate with cognitive test results.

Imaging Biomarkers of Dementia Risk in TIA: A Five-Year Study of Hippocampal and Global Atrophy

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Background: Transient ischemic attack (TIA) patients exhibit accelerated hippocampal atrophy linked to cognitive decline and dementia risk, though longitudinal dynamics remain understudied [1]. The hippocampus, a critical biomarker for neurodegeneration and dementia, requires precise segmentation to quantify atrophy rates. Whole brain atrophy rates, another biomarker of cognitive decline, have been shown to be increased in minor stroke patients longitudinally [1, 2], but no current studies investigate the connection between whole brain and hippocampal atrophy. Traditional segmentation methods face challenges in standardization, but FreeSurfer - an open-source, widely-used neuroimaging software suite for brain region segmentation - offers an automatic and highly accurate method for streamlining this process [3]. This study leverages FreeSurfer to analyze longitudinal hippocampal

and whole brain volume changes in TIA patients over five years, hypothesizing that atrophy rates will be higher in TIA patients, trending in line with cognitive deterioration before clinical dementia diagnosis.

Methods: A prospective cohort of 259 first-time TIA patients and 211 healthy controls underwent MRI scans at year 0, 1, 3, and 5, and cognitive assessments annually. After bias-field correction, skull-stripping and atlas-registration, hippocampal and whole-brain volumes were automatically segmented via FreeSurfer. Annualized atrophy rates were calculated via linear mixed-effect models, adjusting for age, sex, and vascular risk factors. Hippocampal atrophy is also corrected for whole brain atrophy.

Results: A total of 932 scans were processed. At baseline, mean raw hippocampal volume was 5.46 cc in controls versus 4.90 cc in TIA patients; after adjustment for age and sex, volumes were 5.52 cc and 5.27 cc, respectively. Over five years, hippocampal volume declined from 4.90 cc to 4.52 cc in TIA patients versus 5.46 cc to 5.31 cc in controls. Adjusted annual atrophy rates were 0.06 cc/year (1.1 vol%/yr) in TIA patients versus 0.02 cc/year (0.36 vol%/yr) in controls ($p<0.001$). Whole-brain atrophy analysis is ongoing but expected to demonstrate a similarly accelerated decline in the TIA cohort [2]. The relationship between whole brain and hippocampal atrophy will also be examined, with a whole-brain corrected hippocampal atrophy analysis.

Conclusions: TIA patients show both lower baseline hippocampal volume and a three-fold greater hippocampal atrophy rate compared to controls, independent of age and sex. These findings underscore hippocampal atrophy as a sensitive preclinical biomarker of post-TIA cognitive decline, detectable well before the onset of dementia. Completion of whole-brain atrophy analysis will clarify whether global neurodegeneration parallels regional hippocampal loss, providing complementary markers of vulnerability. Together, these metrics could enable earlier identification of high-risk individuals, optimize patient stratification in clinical trials, and support the development of targeted neuroprotective interventions aimed at delaying or preventing dementia.

Bibliography available upon request.

Relationship Between the Brain Structural Connectome and Cerebrovascular Reactivity in Cerebral Amyloid Angiopathy

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Background: Cerebral amyloid angiopathy (CAA) shares pathophysiological links to Alzheimer's disease (AD). Specifically, CAA is characterized by the accumulation of beta-amyloid in the walls of the small blood vessels of the brain and leptomeninges rather than the parenchyma as in AD. CAA is the second most common form of cerebral small vessel disease, a major cause of intracerebral hemorrhage and increases the risk of cognitive impairment and dementia. The brain structural connectome reflects white matter (WM) connections between brain regions, and its disruption is associated with lower cognitive function in patients with CAA. However, mechanisms underlying the disruptions of the structural connectome observed in patients with CAA are poorly understood. Cerebrovascular reactivity (CVR) is also lower in CAA patients and may contribute to the disrupted structural connectome; although, this has yet to be investigated. This study sought to determine whether changes in the brain's structural connectome are associated with CVR in patients with CAA, AD and mild cognitive impairment (MCI).

Methods: In this two-site study, patients with CAA, AD and MCI, and healthy controls (HCs) were recruited from stroke prevention, memory and cognitive disorders clinics, and the local community. All participants underwent a 3T MRI that included a T1-weighted image, diffusion weighted imaging (DWI) and blood-oxygen level dependent imaging (BOLD) involving a 2-minute hypercapnic challenge (5% inspired CO_2). To generate structural connectomes, white matter tracts were reconstructed using streamlined constrained spherical deconvolution DWI tractography, which were then combined with 90 cortical and subcortical regions parcellated using the automated anatomical labelling (AAL) atlas. Structural connectome measures of global and local network efficiency, and characteristic path length were derived from fractional

anisotropy (FA) weighted connectivity matrices while gray matter (GM) and WM CVR were expressed as the % change in BOLD per mmHg increase in end-tidal partial pressure of CO_2. Group differences in structural connectome and CVR measures were adjusted for age, sex and site while associations between structural connectome and CVR measures were assessed using multivariable linear regression adjusted for age, sex, hypertension, site and group.

Results: Data from 45 CAA (74±7y; 17 female), 16 AD (69±6y; 8 female), 25 MCI (72±8y; 8 female), and 54 HCs (69±5y; 36 female) were analyzed. Compared to HCs, CAA participants had lower global (0.165±0.014 *versus* 0.181±0.007, p<0.001) and local efficiency (0.194±0.018 *versus* 0.216±0.011, P<0.001), and longer characteristic path length (7.030±0.612 *versus* 6.335±0.261, p<0.001). In contrast to CAA participants, global and local efficiency, and characteristic path length did not differ between AD and MCI with HCs ($p^3$0.113). In regression analyses, global and local efficiency were positively associated with GM (PE, 95% CI: 0.02, -0.001-0.050; p=0.057 and 0.04, 0.003-0.070; p=0.032, respectively) and WM CVR (0.04, 0.002-0.008; p=0.040 and 0.06, 0.011-0.117; p=0.018), while characteristic path length was negatively associated with CVR (GM: -0.93, -1.878-0.017; p=0.054 and WM: -1.66, -3.250- -0.060; p=0.042, respectively).

Conclusion: Disrupted brain structural connections are associated with a reduced ability of the brain to increase blood flow when needed. These findings support the premise that neurological impairment in CAA may result from decreased CVR.

Cross-Cohort Evaluation of the Brain Age Gap as a Biomarker for Dementia Severity

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Background/Objectives: The growing prevalence of dementia worldwide has created an urgent need for reliable biomarkers to support clinical staging and differentiation of underlying pathological subtypes. Brain age prediction models, which estimate biological brain age from neuroimaging data, have gained significant attention over the past decade. A key metric that can be derived from using these models is the brain age gap (BAG), which is defined as the difference between the predicted biological age and chronological age. The BAG can provide a quantitative measure of accelerated brain aging and holds promise as a biomarker for neurodegenerative diseases. This study investigates the utility of a pre-trained deep learning model for estimating individual BAGs across diverse dementia populations and diagnostic categories.

Methods/Overview: We applied a Simple Fully Convolutional Network (SFCN) architecture, which was trained to predict the biological brain age using T1-weighted MRI scans from over 5,000 healthy participants. The trained model was then used to predict the biological brain age and corresponding BAG for patients with varying forms of dementia from four large-scale datasets, namely the Alzheimer's Disease Neuroimaging Initiative (ADNI), the National Alzheimer's Coordinating Center (NACC), the Canadian Consortium on Neurodegeneration in Aging (CCNA), and Neuroimaging in Frontotemporal Dementia (NIFD).

Results: All dementia subgroups showed an accelerated brain aging (BAG > 0) but with considerable variability within each subgroup. Frontotemporal dementia (FTD) exhibited the highest average BAG (8.34 ± 5.09 years), followed by Parkinson's disease dementia (PDD; 7.28 ± 3.65) and Alzheimer's disease (AD; 6.76 ± 5.59). Lewy body dementia (LBD; 4.89 ± 4.31), vascular dementia (VaD; 3.78 ± 5.50), and mild cognitive impairment (MCI; 2.17 ± 5.56) showed lower average BAGs, matching expected patterns of cortical and subcortical degeneration severity that are observed in practice across these dementia subtypes. Generally, the MCI subgroup from ADNI displayed higher average BAG values while the AD subgroup showed lower average BAG values in comparison to their counterparts in the other databases. This discrepancy may reflect the presence of undiagnosed mixed pathology or the lack of explicit separation of vascular contributions in ADNI, unlike CCNA, which includes distinct MCI-VaD and AD-VaD categories. Overall, these findings demonstrate that the BAG not only has the potential to discriminate between pure dementia subtypes but also mixed pathologies, capturing meaningful structural differences across the full spectrum of neurodegenerative burden, without disease-specific training.

Conclusion: This study demonstrates that the BAG is a promising marker of brain health, which is sensitive to both disease stage and underlying pathology. Higher BAG values were found for dementia forms characterized by more aggressive atrophy on structural MRI, ranging from mild elevations in MCI (BAG ≈ 2 years) to pronounced deviations in FTD (BAG ≈ 8 years). Clinically, BAG may enhance differential diagnosis by distinguishing overlapping pathologies (e.g., FTD vs. AD vs. LBD), thereby supporting more personalized treatment strategies. Integrating BAG into routine imaging workflows holds considerable promise for improving diagnostic accuracy, tracking disease progression, and tailoring interventions in neurodegenerative care.

Severity of Self-Reported Memory Complaints in Cognitively Unimpaired Older Adults are Associated with Neuropsychiatric Symptoms and Executive Function

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Background: Subjective cognitive decline (SCD) is defined as self-reported cognitive difficulties despite having unimpaired objective performance on cognitive tests. SCD has been associated with increased likelihood of cognitive decline and dementia [1, 2], with an average conversion rate of ~20% to mild cognitive impairment [3-8]. Given the absence of objective cognitive deficits, it is challenging to determine which specific features of SCD reflect dementia risk. Other factors which contribute to cognitive decline, such as sleep disturbances, neuropsychiatric symptoms and vascular burden, also co-occur in SCD and may contribute to increased dementia risk. Importantly, most studies to date treat SCD as a categorical variable, but self-reported complaints exist on a continuum. Examining the severity of these complaints may provide a more nuanced understanding of SCD and its relationship with dementia risk [9]. In the current study, we examined whether the severity of self-reported memory complaints, assessed as a continuous variable, was associated with (1) risk factors for cognitive decline and (2) with cognitive performance in cognitively unimpaired older adults.

Method: We recruited 60 cognitively unimpaired older adults (aged 60-88 years; 45M/15W), defined as normal performance on the Montreal Cognitive Assessment, the Clinical Dementia Rating scale, and the Wechsler Memory Scale. All participants completed a questionnaire assessing subjective memory complaints (Subjective Memory Complaints Scale; SMCS [9]). To assess sleep, participants completed questionnaires measuring daytime sleepiness (Epworth Daytime Sleepiness), insomnia risk (Insomnia Severity Index), and sleep apnea risk (Berlin Questionnaire). Participants also completed the Geriatric Depression Scale (GDS), Getriatric Anxiety Scale (GAI), the Mild-Behavioral Impairment scale (MBI), and vascular burden. In addition, neuropsychological testing assessed cognitive function across five domains (memory, executive function, attention, language, visuospatial abilities). We performed Pearson correlations and applied False-Discovery Rate to correct for multiple comparisons. We report the adjusted p-values.

Result: We found that subjective memory complaints, assessed using the SMCS, were associated with higher levels of neuropsychiatric symptoms *(GDI: $p<0.0005$; GAI: $p=0.01$; MBI; $p=0.04$)*. We also found a trend between more subjective memory complaints and worse daytime sleepiness *(Epworth: $p=0.06$)*. No associations were found with risk of insomnia or of apnea, and with the level of vascular burden. When we tested the relationship between subjective memory complaints and cognition, we found that SMCS scores were not associated with memory performance, language, visuospatial abilities nor with attention. However, more subjective memory complaints were associated with worse executive function *(Trail Making Test B: $p=0.03$; Stroop Flexibility: $p=0.002$)*.

Conclusion: Our findings suggest that higher levels of subjective memory complaints are associated with worse neuropsychiatric symptoms. These findings highlight the need to expand our characterisation of SCD beyond just cognition, but also consider behavioural and affective symptoms. Furthermore, while self-reported memory complaints were not associated with worse memory performance, they were associated with worse executive function, perhaps suggesting early domain-specific vulnerability. Future work will be needed to replicate these findings.

Evaluating the Impact of Using Virtual Reality and Artificial Intelligence to Support Technology-Enabled Reminiscence Therapy for People with Dementia and Caregivers

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Introduction: The introduction of reminiscence therapy through virtual reality (VR) technology combines sight, touch, sound, and events from past experiences. Our exploratory study seeks the input of People Living with Dementia (PLWD), care partners, and program workers of dementia care services in enhancing VR reminiscence therapy prototype using Cognitive Stimulation Exergaming and Conversational Artificial Intelligence (AI) Avatar. This will facilitate the engagement of PLWD in meaningful activities and reduce apathy symptoms.

Objective: The objective of our project is to evaluate the potential use of technology-enabled reminiscence therapy, using VR, exergaming and AI to support PLWD in our Alzheimer's Society local chapter's dementia care programs.

Methods: This research focuses on the use of co-designing approaches with PLWD, their caregivers and healthcare providers. It aimed to explore and understand the participants' perspectives on applying VR, exergaming and AI features as immersive approaches to facilitate reminiscence therapy for PLWD. VR reminiscence experiences are conducted through usability testing for 30 to 45 minutes once a week

for six weeks, including assessing the user interface, system functionality and user responses, including cognitive function, depressive and apathy symptoms.

Results: Our study employs Meta Quest 3 VR headsets, and the pilot usability aims to stimulate cognitive engagement and physical interaction within the VR space and promote reminiscence therapy through memory recall and exergaming. After the interaction with VR reminiscence experiences, participants interact with a Digital Avatar. The AI component of reminiscence therapy has three mode: (1) Conversational Mode - Simply chat with AI avatar, and they will respond; (2) Open User Defined Storytelling Mode - AI avatar will ask PLWD about a story or experience they have done; and (3) Caregiver Story Mode - The caregiver inserts a story, and the AI will help the PLWD remember each section of the story to reminiscence the past experience. Through this non-pharmacological approach, our preliminary study reveals that this intervention has the potential to assist PLWD with recalling memories of their past lives, reducing symptoms of depression and apathy, as well as improving their social connection with caregivers.

Conclusion: When developing new therapies, it is critical to include the perspectives of the potential end users through participatory co-designing. Our study achieves this by engaging PLWD, caregivers, and care providers through exploratory co-designing and usability testing of reminiscence therapy using VR and Conversational AI features. Utilizing co-designing approaches enhances the trust and collaboration between the study participants and the researchers, which is vital for our study as we seek to introduce VR and AI in healthcare. This study is of relevance to dementia care services and programs to explore the opportunities for educational training, resources and support to better equip care providers related to the use of VR and AI tools to support healthcare delivery, with the aim of supporting technology-enabled dementia care.

Examining White Matter Integrity in Later-Life Attention Deficit/Hyperactivity Disorder

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Background: Attention deficit/hyperactivity disorder (ADHD) in later life is an independent risk factor for suboptimal cognitive aging and dementia. White matter integrity (WMI) is reduced in young and middle-aged adults with ADHD relative to neurotypical peers; however, it is yet unknown if these alterations persist or change in later life. Aberrant WMI in ADHD may be a marker of neurobiological vulnerability to subsequent deterioration from both normal and degenerative brain aging processes. The objectives of this study were to characterize WMI in adults aged ≥50 with ADHD and to examine age-dependent WMI compared to healthy controls.

Methods: Adults aged ≥50 with ADHD were recruited from the community. ADHD diagnosis was confirmed through structured clinical interview. Age-, sex-, and education-matched healthy control data were collected from the Comprehensive Assessment of Neurodegeneration and Dementia prospective cohort study. All participants underwent a harmonized structural neuroimaging protocol with diffusion-weighted sequences. Fractional anisotropy (FA) was calculated as a metric of WMI using tract-based spatial statistics. Tracts of interest included the corpus callosum (genu, body, splenium), uncinate, cingulum (dorsal, ventral), and corona radiata (anterior, superior, posterior). Between group differences in mean FA for specified tracts were examined using t-tests ($p<0.05$, Bonferroni corrected for multiple comparisons). Within group relationships between age and FA were investigated with Spearman's correlations.

Results: These preliminary analyses included 29 individuals with ADHD (age= 65.2 ± 6.4 years (range: 56-80 years), 65.5% female, education= 15.1 ± 2.2 years) and 29 matched controls (age= 65.8 ± 4.7 years (range: 60-78 years), 65.5% female, education= 15.2 ± 1.7 years). ADHD participants showed significantly lower FA in the body of the corpus callosum, dorsal cingulum, and posterior corona radiata. Conversely, the ADHD group demonstrated higher FA in the anterior portion of the corona radiata. There were significant correlations between age and FA in the body of the corpus callosum (rho=-.38, p=.043) in ADHD, and between age and FA in the posterior corona radiata (rho=-.40, p=.031) in healthy controls. No other significant correlations were found in either group.

Conclusion: ADHD was associated with aberrant WMI in tracts implicated in attentional control, executive function, and visuospatial processing. Additionally, the body of the corpus callosum, a region involved in sensory-motor integration and higher-order associative processes was vulnerable to age-related decline in ADHD brain aging. These preliminary findings suggest that WMI abnormalities in ADHD may persist into later life, potentially creating susceptibility to poor cognitive aging. Future work from our research group will investigate relationships between WMI and cognition in later-life ADHD.

Active Living Inputs into Cognition: Proposing a Hypothesis

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Background: Active living (AL) is a broad concept aiming to address health issues associated with inactivity. Mayo et al. identified that older adults expressed AL as a way of being

that goes beyond activities done but influenced by physical and mental capacities, and social determinants of health (SDoH). This is particularly relevant to older people whose physical capacities are declining but who still wish to live actively and maintain cognitive health (CH). Whether AL and its contributors can preserve cognitive ability (CA) is not known, but this knowledge would open avenues for promoting CH in older persons.

Objectives: To identify the extent to which AL factors are independently associated with self-reported CA, and to identify profiles of people with low self-reported cognitive ability (LCA).

Methods: A secondary analysis of a cross-sectional study was conducted using survey responses from 1,612 older adults (65+years) from Canada, UK, USA, and Netherlands. The survey covered self-reported CA, personal and intrinsic capacity factors, SDoH, and AL factors. Self-reported CA was measured using the short form of the Communicating Cognitive Concerns Questionnaire (C3Q) and dichotomized at the 25th percentile. Active living indicators were assessed using the Older Persons Active Living Related Quality of Life (OPALrQOL) measure. Logistic regression identified factors independently associated with cognitive ability, and classification tree analysis were used to identify predictors and profiles of people with different levels of cognitive ability.

Results: Putative factors for LCA were fatigue-days, anxiety/depression, difficulty with bath transfers, not feeling resilient, not feeling connected, hearing disability, cardiovascular disease, needing a push to get started, inability to walk for 30 minutes, and difficulty with light household activities. Protective factors were being interested in learning new things, waking feeling fresh and rested, and having a confidant or trusted person. The model showed excellent prediction (c=0.819). Based on the decision tree model, individuals with the highest prevalence of low cognitive ability (57%; 95% CI: 51.8-62.3) were characterized by fatigue, anxiety/depression, and low resilience. The model achieved a predictive accuracy of 77.9% and an AUC of 0.73, indicating moderate discriminative performance.

Conclusion: Our study highlights the multidimensional nature of factors associated with cognitive ability in older adults, spanning for example, systemic, biological, sensory, physical, functional, psychological, social domains. The strong and consistent relationship between fatigue, and not feeling resilient, with cognitive ability, represent novel finding that deserves greater attention in both research and practice. But the cross-sectional nature of the design cannot sort out which came first the "chicken or the egg" for the factors of fatigue, and active living (lack of resilience). Our findings support a comprehensive approach to promoting cognitive health that addresses fatigue management, mental health, resilience promotion, social support, and promotion of physical activity with implications for healthcare providers, public health practitioners, and policymakers.

Cerebrospinal Fluid Analysis of Amyloid Aβ1-42 and P-Tau in Transient Ischemic Attack Patients and Healthy Controls

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Background: Individuals who experience transient ischemic attacks (TIAs) are 5 times more likely to develop dementia, however, underlying mechanisms remain understudied, specifically related to vascular and neurodegenerative etiologies 1. The detection of the disease, prior to the emergence of significant cognitive decline, remains difficult due to a lack of reliable biomarkers signaling the onset of Alzheimer's disease (AD)2. The presence of both AD and cerebrovascular pathology can be described as mixed dementia and is the most common type of dementia in geriatric populations3. This study investigates differences in cerebrospinal fluid (CSF) biomarkers of Beta-amyloid ($A\beta_{42}$ & $A\beta_{40}$), total tau (t-tau), and phosphorylated tau (p-tau) among participants with TIA and healthy controls. Furthermore, this study aims to understand the relationship between CSF biomarkers and markers of cognitive decline (brain atrophy and white matter hyperintensities). Thus, this study aims to (1) investigate whether CSF AD biomarkers differed in participants who experienced TIAs, (2) examine the relationship between CSF biomarkers, cognitive decline and brain atrophy, and (3) examine the relationship between CSF biomarkers, cognitive decline and white matter hyperintensities.

Methods: Participants without cognitive symptoms were recruited from a prospective case-control study. Participants completed cognitive testing and serial MR imaging over 5 years and underwent a lumbar puncture for CSF collection. $A\beta_{42}$, $A\beta_{40}$, t-tau, and p-tau concentrations in CSF were quantified using the INNO-BIA AlzBio3 kit. For brain atrophy, both hippocampal and whole brain volumes were segmented using FreeSurfer after skull-stripping and atlas registration. White matter hyperintensities (WMH) were segmented using the Lesion Probability Algorithm. Linear regressions examined group status as a predictor of plasma biomarker concentrations, while controlling for age.

Results: TIA participants (n=34, *Mage=68.74 years*, SD_{age}=8.73 years) were similar in age to the healthy controls (n=36, M_{age}=64.61 years, SD_{age}=10.16 years). Controls had significantly higher scores on the MoCA and ACE-R (M_{moca}=26.71, $M_{ace\text{-}r}$=93.31), compared to TIA (M_{moca}=24.33,

p=.002; $M_{ace\text{-}r}$=89.67, p=.017, respectively). Group status was predictive of p-tau, with TIA participants having significantly higher p-tau ($M_{p\text{-}tau}$=56.733 ng/L) than controls ($M_{p\text{-}tau}$=41.98 ng/L), β=11.58, t=2.08, p=.041. Group status was not a predictor for ratios of p-tau over Aβ42 (TIA: M=.078 ng/L; Controls: M=.047 ng/), β=2.41, t=1.97, p=.053, or t-tau (TIA: M=435.25 ng/L; Control: M=321.75 ng/L) β=86.81, t=1.96, p=.055.

Conclusions: This study suggests that those with TIA, compared to healthy controls, have greater p-tau and lower beta-amyloid, suggesting an early AD-type biomarker profile which may in part explain the increased risk of dementia post-TIA. Further analysis will utilize regression models to determine the relationship between CSF biomarkers, cognition, atrophy rates, and white matter hyperintensities. These findings may contribute to enhancing early detection of this life-changing disease, which is crucial given the progressive loss of neurons decades before symptoms become detectable.

A Nationalwide Treatment Management Platform to Enable Safe, Scalable Deployment of Disease-Modifying Therapies in Alzheimer's Disease

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Background: As Canada prepares for the arrival of disease-modifying therapies (DMTs) for early Alzheimer's disease (AD), there is growing recognition that system-level readiness will be essential to ensure safe and equitable access. A critical barrier may lie in clinician capacity and the lack of coordinated treatment systems[1-3]. Few specialists are currently equipped to initiate and monitor DMTs, and the complexity of care, particularly related to ARIA (amyloid-related imaging abnormalities) surveillance, makes scaling challenging[1,2]. Physicians must interpret serial MRIs, assess evolving risk profiles, and coordinate care decisions, all of which restrict how many patients can be safely managed.

Data from early-adopting centres in the United States suggest that physician capacity plateaus at 10-16 patients per specialist[4], with likely lower numbers in resource-limited clinics, underscoring the need for tools to enable safe, scalable DMT delivery.

Objective: We propose to evaluate Foresight™, a treatment management platform designed to streamline workflow integration and safety monitoring for disease modifying therapies. The platform includes ARIA surveillance tools, treatment tracking, eligibility screening, real-time alerts, and structured data capture to support decision-making and reduce workflow fragmentation facilitating exchange of information between members of the care circle.

Methods: This prospective, multi-center, 12-month implementation study will deploy the platform across at least 5 memory clinics in a nation-wide initiative across Canada. Sites include both academic and community-based clinics with varied access to imaging and infusion services. Consecutive patients with early symptomatic AD (MCI or mild dementia) eligible for DMTs will be enrolled per local or international guidelines.

The platform will capture structured data including cognitive scores, APOE genotype, biomarkers, MRI scheduling and results, infusion records, and adverse events. It will enable automated tracking of safety timelines (e.g., MRI surveillance) and trigger alerts for missed monitoring or delays in care. Physicians can document adverse events and treatment actions (pause, resume, discontinue). Workflow interruptions (e.g., missed MRIs, delayed infusions, ARIA events) and resolution times will be automatically logged.

Outcomes: The **primary endpoint** is normalized physician treatment capacity, defined as the number of DMT-treated patients per full-time equivalent physician. **Secondary outcomes** include workflow interruption frequency and deviation resolution rates. Sites will perform a pre-post comparison using historical data, and a qualitative arm will assess clinician satisfaction and barriers to adoption via standardized surveys at 3, 6, and 12 months. All data will be de-identified and analyzed locally and in aggregate.

Expected Results: We anticipate the platform will increase the number of patients managed per physician, reduce coordination delays, and improve adherence to safety protocols, without compromising clinical oversight[5]. This would demonstrate improved operational capacity through digital enablement.

Conclusion: Scaling DMTs delivery requires more than diagnostic or infusion infrastructure, it demands tools that streamline clinical workflows. By improving coordination

and enabling proactive safety monitoring, the proposed platform may offer a scalable solution for increasing DMTs access across diverse clinical settings, supporting both current therapies and future entrants in Canada.

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Examining the Link Between Sleep Quality and Mild Behavioural Impairment in Dementia-Free Older Adults

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Introduction: Poor sleep quality is a modifiable risk factor increasingly linked to cognitive decline and neurodegeneration. Sleep is a physiological process essential for memory consolidation and clearance of neurotoxic proteins, and disturbances in sleep have been associated with higher risk of mild cognitive impairment and dementia. Mild behavioural impairment (MBI) is a pre-dementia syndrome characterized by later-life emergent and persistent neuropsychiatric symptoms, serving as an early marker of cognitive decline and incident dementia. However, the relationship between sleep quality and MBI remains unclear. Here, we investigated the association between sleep quality and MBI status to evaluate whether poor sleep is associated with emergent behavioural symptoms that may indicate early neurodegenerative changes.

Methods: Baseline data were analyzed from 330 older adults (age 71.0 ± 6.6 years, 56.4% female, 49.7% MCI) in the Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) study. Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI), with scores >5 indicating poor sleep quality. MBI status was assessed using the Mild Behavioral Impairment Checklist (MBI-C), where scores ≥7 indicated MBI. Logistic regressions modelled associations between sleep quality (exposure) and MBI status (outcome), adjusting for age, sex, education years, and cognitive performance (Montreal Cognitive Assessment - MoCA score). Secondary analyses examined associations between individual PSQI components and MBI. A sleep quality*sex interaction term was included to assess whether associations differed by sex.

Results: Poor sleep quality was associated with significantly higher odds of MBI (OR=2.49, 95% CI=1.46-4.30, p<0.001). The association was primarily driven by two PSQI components: sleep medication use (OR=1.27, 95%CI=1.01-1.58, p=0.04) and daytime dysfunction (OR=1.90, 95%CI=1.30-2.82, p=0.001). No significant associations were found with other PSQI components. Additionally, no significant interaction was observed between sex and overall sleep quality (p=0.77), sleep medication use (p=0.75), or daytime dysfunction (p=0.14) on MBI status.

Discussion: Findings demonstrate that poor sleep quality, particularly daytime dysfunction and the use of sleep medication, is associated with early behavioural changes commonly linked to neurodegeneration. These results highlight the link between these two important indicators of dementia risk. Identifying specific sleep-related factors associated with MBI, provides support for further exploration of these factors in future research, as potential early intervention targets aimed at delaying behavioural impairment. While potentially causal, such associations could also reflect shared underlying mechanisms, such as emerging neurodegenerative pathology. Longitudinal studies are needed to clarify the directionality of these relationships and to further explore underlying mechanisms. A deeper understanding of how sleep patterns relate to neuropsychiatric symptoms may improve identification of at-risk individuals, elucidate disease mechanisms, and inform future intervention strategies.

Solutions for Improving Incapacity Literacy and Substitute Decision-Making

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Background: There is a systemic problem in the health, legal, housing, and financial sectors to work with substitute decision makers appropriately.

There is a disconnection between how people plan, monitor, and use this authority. Service providers across the health, legal, housing and financial sectors are responsible for identifying incapacity to restrict the autonomy of an adult - but they don't have any systems to identify risks of incapacity.

Fraud and inappropriately restricting autonomy can result in irreparable family relationships, losses to a person's health, finances, and reputation - including exposure to expensive lawsuits.

Methodology:

Education: Improving Incapacity Literacy

Our provisional definition of incapacity literacy is the knowledge and skills that enable people to plan, monitor, and apply information for knowing when and how to appropriately use a substitute decision making authority.

Validation Solutions:

To reduce the risk of POA fraud, we have created a proactive and reactive solution. Proactively, users are encouraged to register their POA from the time of signing into their Decision-Making Network (across the financial, health, legal and housing sectors). This source of truth connects the applicable network to the appropriate notices of revocation or fraudulent events.

Our reactive solutions provide a state-of-the-art due diligence tool - Validate You. Validate-You provides a business with 4 points of fraud prevention including: the substitute decision maker's identity, the legal requirements, and against a conflicting document data set, and anti-money-laundering searches.

Incapacity/Activation Solutions:

DecisionTracker (Incapacity Screening/Monitoring)

Our universal incapacity screening tool, DecisionTracker, confirms the decision maker's understanding of their limitations, need for assistance, and circumstances across 7 categories of biological, psychological, social, legal, and financial decision-making vulnerabilities. This informant-based model that can be administered by anyone without need for training helps to determine risks for potential incapacity and or undue influence that may be formally assessed.

Standardization of Incapacity Assessments: Assess-You

Reliability and standardization of assessing incapacity remains elusive and can be influenced by corroborative information which may be biased or unattainable, potential outcomes, risks, social conflicts, and impact on family or supportive friends. Incapacity cannot be determined by diagnosis or cognitive rating scale.

We developed a standardized semi-structured method and system for assessing decision-making capacity that can be applied consistently across all types of decision-making tasks - called Assess-You. The software helps gather the essential information and capture relevant data for legislated and common law-based decision-making assessments across Canada. The software provides a semi structured interview guidance with suggested probing questions to evaluate each criterion of each selected medical legal test. Our software incorporates custom privacy and security architecture to ensure data protection and regulatory compliance.

Conclusion: Our goal is to create a comprehensive solution that addresses the complex needs of individuals with decision-making capacity issues to protect autonomy while assisting vulnerable individuals receive the support they need in a timely manner.

Baseline and Follow up Positron Emission Tomography with Fluorine-18 Radiolabelled Glucose Analog Computerised Tomography (FDG PET/CT) Scans in Participants with Subjective Brain Fog from Long COVID

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Background/Objectives: Long COVID is a recognised condition following a COVID-19 infection. It causes multisystem involvement, including the brain, resulting in cognitive and psychiatric changes. FDG PET/CT scanning has shown bilateral hypometabolism in a consistent pattern in rectal/orbital gyrus, including the olfactory gyrus; right temporal lobe, including the amygdala and the hippocampus, extending to the right thalamus; pons/medulla brainstem; and cerebellum. These metabolic clusters may help to discriminate patients and healthy subjects.

Methods: Participants in a Long COVID study with subjective brain fog were evaluated with baseline and follow up FDG PET/CT scans, and clinical and cognitive testing. Participants were randomised to placebo versus medium chain triglyceride (MCT) oil consumption. The study is still ongoing, so randomisation is still blinded. A standard 18F-FDG PET/CT brain protocol was utilized. 18F-FDG was injected intravenously (dose of 8-10 MBq/kg) with a 1-hour uptake period, followed by dedicated PET acquisition of the brain (attenuation corrected (AC), Smooth AC, and non-attenuation corrected (NAC)) and low-dose CT head performed for attenuation correction. Iterative image reconstruction was utilized to generate images in 3 standard axes. Statistical parametric mapping was performed using Siemens SyngoVia MI Neurology software, with comparison to an age-matched normal database. Semiquantitative analysis performed using Oasis and SPM via SyngoVia. On SyngoVia, image sets were either compared to FDG-PET Biograph 19-44 or 46-79 reference brain databases (with normalization to both 'Cerebellum + Vermis' and 'Whole Brain'). Radiologic evaluation was undertaken blinded to clinical and cognitive test results.

Results: Six participants were evaluated at the two time points, approximately 18-months apart. All were female, average age 42.8 years (40-47) with clinically diagnosed long COVID brain fog > 3 years. None required hospitalisation for their COVID-19 infection/s. All had measurable cognitive deficits at baseline and follow-up. All had abnormal baseline FDG PET/CT scans, but no structural abnormalities on CT. Z scores were abnormal in some regions in all of the participants, particularly in whole brain, olfactory/rectal gyrus and amygdala. Z scores trended down for whole brain in 3/6 participants; for olfactory region 4/6; for rectus gyrus 2/6; and for amygdala 4/6. Two participants were unable to take any study oil. There was a mix of changes in different

brain regions for all but one participant in whom all Z scores worsened. Clinically that participant couldn't tolerate any study oil, their symptoms were unchanged and ongoing, and they scored in the 1st percentile on psychomotor function and attention testing. Overall, compared to baseline FDG PET/CT scans, 3 were unchanged, 2 worsened and 1 improved. However, none were reported as normal.

Conclusions: Early data in these six participants suggests a guarded prognosis for recovery of brain metabolic changes in women with Long COVID. However, the numbers are small, oil randomisation is still blinded, and there are other symptoms, especially fatigue, that may impact cognitive function. Final analysis at the end of the study will determine if this is the natural history of Long COVID, or if MCT oil consumption had any influence on FDG PET/CT changes.

A Multidomain Personalized Community-Based Approach to Dementia Risk Reduction Improves Lifestyle Behaviours and Cognition Over 6 Months

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Background/Objectives: A healthy lifestyle has shown promise in reducing dementia risk, but most interventions do not consider baseline risk profiles and individual preference in programming. The Kimel Family Centre for Brain Health and Wellness is a research-based community centre delivering personalized dementia risk reduction programs to adults ages 50+ without dementia. This study examined change in lifestyle behaviours and cognition over 6 months among 186 participants (M_{age} = 69.7, 75% women). Sex and age differences were explored. Program feedback was also obtained.

Methods/Overview: At baseline, participants underwent a dementia risk assessment including Cogniciti's Brain Health Assessment, from which a Personalized Dementia Risk Report and Program Strategy was provided, showing risk in five domains: physical activity, brain-healthy eating, cognitive engagement, social connections, and mental wellbeing (depression, anxiety, distress, and perceived stress). Participants then enrolled in programs of their choice to address their risk domains. At 6 months, risk in the five domains and cognition were reassessed. Program feedback was obtained after 6 months of participation from 128 participants, asking about their satisfaction with programs, learning about their dementia risk, and making lifestyle changes; as well as what they like and what could be improved at the Centre.

Results: Linear mixed-effects models showed a significant ($ps<0.05$) increase in brain-healthy eating (M_{diff} = 0.60) and decrease in loneliness (M_{diff} = -2.40), depression (M_{diff} = -1.66), and perceived stress (M_{diff} = -2.20). No changes in physical activity, cognitive engagement, distress, or anxiety were found. There were no sex differences in lifestyle change. Cognition improved from baseline to 6 months (M_{diff} = 8.91), with larger effects in men (M_{diff} = 11.73) compared to women (M_{diff} = 5.64). No age differences were found for any outcome. Most participants were satisfied with programs (75-78%), learning about their dementia risk (84%), and making lifestyle changes (77-87%). Participants commonly endorsed support from staff and instructors, program offerings, and the facilities as the most positive features of the Centre. More hours of operation, access to communal eating spaces, and tweaks to the program schedule were frequently identified areas of improvement.

Conclusion: A multidomain, personalized, community-based approach to dementia risk reduction improves lifestyle engagement and cognitive health. Findings demonstrate good acceptability among participants, with implications for delivering effective personalized dementia risk reduction programs in the community. The Kimel Family Centre for Brain Health and Wellness has real-world applicability in the global effort to reduce dementia risk.

Associations Between Cerebral Amyloid Angiopathy-Related Neuroimaging Biomarkers and Depressive Symptoms

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Background/Objectives: Cerebral amyloid angiopathy (CAA) independently increases the risk of intracerebral hemorrhage, cognitive decline, and dementia. Depression is similarly associated with an increased risk of stroke and adverse cognitive outcomes. Depressive symptoms are among the most frequently reported neuropsychiatric symptoms in CAA. This study examined whether markers of CAA-related brain damage could predict the severity of depressive symptoms.

Methods/Overview: Cross-sectional data were analyzed from a prospective cohort study of participants with CAA. Several neuroimaging biomarkers, measured using MRI, were selected based on prior literature: white matter hyperintensity (WMH) volume, cortical thickness, perivascular space (PVS) grades in the centrum semiovale (ranging from grades 0-4), presence of any cortical superficial siderosis (cSS), cerebral microbleed count, and CAA small vessel disease (SVD) scores (ranging from 0-6). Depressive symptoms were assessed using the self-report 15-item Geriatric Depression Scale: Short Form (GDS-15). Negative binomial regression models were used to examine whether CAA neuroimaging biomarkers were associated with depressive symptoms (GDS-15 score count). All models were adjusted for age.

Results: 79 participants with CAA were included. The median GDS-15 score was 2 (interquartile range 0-4). In adjusted models, higher GDS-15 scores were associated with lower mean cortical thickness (rate ratio [RR] = 1.26 per SD decrease in thickness, 95% CI: 1.02-1.56, $p = 0.04$), and cortical superficial siderosis (RR = 2.29, 95% CI: 1.50-3.50, $p < 0.001$), but not WMH volume (RR = 1.01, 95% CI: 1.00-1.01, $p = 0.12$), cerebral microbleed count (RR = 1.00, 95% CI: 0.997-1.001, $p = 0.48$), centrum semiovale PVS grade (RR = 0.91, 95% CI: 0.71-1.16, $p = 0.43$), or CAA SVD total score (RR = 1.14, 95% CI: 0.97-1.35, $p = 0.10$).

Conclusion: The association of lower cortical thickness and cortical superficial siderosis with higher GDS-15 scores raises the possibility that damage to the cerebral cortex may underlie some of the depressive symptoms in CAA. Future treatments that ameliorate CAA-related neurodegeneration might prevent depressive symptoms.

Study of Menopause And Resistance Training on Brain Health (SMART Brain)

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Background: Dementia, defined as the loss of cognitive ability in several domains that impair functional abilities in day-to-day life, disproportionately affects more females than males; two-thirds of all individuals with dementia are female. Current research suggests that menopause, a major endocrine transition in a female's life, is a critical period of neuro-aging with long term implications for brain health. During the menopause transition, as ovarian function declines, the body experiences dysregulation of estradiol levels, which is believed to lead to cognitive decline and an increase in dementia specific endophenotypes such as amyloid-beta formation and hippocampal atrophy. Longitudinal studies have shown that a sedentary lifestyle during midlife is one of the largest modifiable risk factors for dementia in later years. Exercise may be an effective, low-cost strategy to improve brain function, potentially offering disproportionately more benefits to females, particularly during the menopausal transition. There is currently a lack of randomized controlled trials exploring the effects of exercise on brain function in females undergoing the menopausal transition. Therefore, the objective of this study was to measure the effect of resistance training on cognition in perimenopausal and early postmenopausal females.

Methods: In our study, 35 perimenopausal and early postmenopausal participants were randomized into a waitlist control group or a 9-month resistance training intervention, exercising twice a week. Cognition was measured via the NIH Toolbox, a valid neuropsychological iPad test battery, as well as validated paper and pen tests at baseline and trial completion. Executive functions were measured using the dimensional change card sort, digit symbol substitution, flanker, list sorting and trail making tests. Memory was measured using the picture sequence memory and Rey Auditory Verbal Learning tests. Processing speed was measuring using the pattern comparison test. ANCOVAs was used to compare the scores of the two groups at trial completion after adjusting to baseline cognitive test score, reproductive stage (perimenopause or early postmenopause), months of hormone use and hysterectomy history.

Results: The resistance training group had significantly higher scores on the dimensional change card sort test which measures set-shifting ($p=0.042$) compared with the control group. Better performance was also seen in the resistance training group for processing speed, inhibitory control and verbal episodic memory, however, these improvements were not significantly different from the control group ($p's>0.05$). A secondary analysis found a significant interaction between intervention group and reproductive stage for episodic memory and set-shifting ($p's<0.05$). Resistance training improved episodic memory recall in only perimenopausal participants ($p=0.033$) and improved set-shifting in only the postmenopausal participants ($p=0.003$) compared with the control group.

Conclusion: We have provided promising evidence that resistance training may be an effective neuroprotective strategy against cognitive decline during the menopause transition, offering reproductive stage-specific cognitive benefits. Further research is needed to understand the mechanisms underlying the effects of resistance training on cognition and determine the minimal effective dose needed to achieve cognitive benefits. Future work should also investigate whether these cognitive benefits translate into a reduced risk for dementia in later years.

Tuning into Senior's Mental Health: Investigating Music Therapy Using Generationally-Relevant Popular Music as a Therapeutic Intervention for Seniors

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Background: Seniors are facing increasing challenges, with loneliness contributing to delays in diagnosing and treating issues such as anxiety, depression, and emotional distress. These conditions are particularly prevalent among institutionalized seniors or those living alone. With the increasing senior population, there is a rising need for non-pharmacological interventions, given the considerable side effects of medications such as antidepressants and antipsychotics. Music Therapy (MT) is a non-pharmacological intervention that utilizes music to support the patients' cognitive, emotional, and social needs. Previous research found that listening to familiar songs activates the medial prefrontal cortex (MPFC) (Area of the brain where memories are stored), while also inducing the release of dopamine, a hormone that helps stabilize mood. However, heterogeneity in genres of music used in MT presents a challenge in determining the most effective genre for treatment. Previous research indicates that pop music from adolescence (ages 13-19) is most easily recalled and may serve as an effective therapeutic intervention. However, its impact on cognitive functioning and mental health remains to be investigated. As a result, this study aims to determine the effectiveness of MT, in both group and individualized settings, on improving overall mental health and memory in patients aged 60 and above.

Methods: A six-week, student-led pilot study is being conducted at two retirement homes, Birdsilver Gardens Senior Support Center, in Pickering, Ontario and the Alexis Lodge in Scarborough, Ontario. This intervention includes both individual listening and group singing activities of popular music from 1945 to 1984. Weekly questionnaires, along with pre- and post-intervention surveys, are administered to track changes in seniors throughout the program. Questionnaires include the World Health Organization Five Well-Being Index (WHO-5), the UCLA Loneliness Scale and the Multifactorial Memory Questionnaire (MMQ), which measure well-being, loneliness and memory. Participants are also prompted to share demographic details and qualitative feedback in pre- and post-intervention surveys, offering insight into their well-being before and after the treatment. Ethics approval and consent were obtained from participants or their legal decision-makers before the program started, and all data collected is anonymous to protect confidentiality. Three analyses will be performed: a qualitative analysis, an independent samples t-test, and an LIWC-22 analysis, to evaluate demographic variables, statistical significance of the intervention and word usage as a correlational metric for well-being, respectively.

Results: It is hypothesized that exposure to pop music from participants' adolescent years will result in significantly higher well-being and improvements in memory.

Conclusion: MT is a cost-effective intervention shown to improve mental well-being and memory in seniors. This study tests the impact of MT on memory and mental well-being in seniors aged 60 and above, aiming to demonstrate the therapeutic benefits of Pop music from participants' adolescent years. Overall, this study aims to establish a clear direction for developing sustainable, non-pharmacological solutions that enhance patient experience and outcomes. Furthermore, we aim to extend this research to seniors with severe cognitive impairments, further demonstrating MT as a method to support well-being and memory recollection.

Keywords: Music Therapy, Mental Health, Seniors, Memory, Well-Being, Cognitive Impairment.

Exploring the Impact of Reminiscence and Art Therapy on Loneliness and Emotional Well-Being in Seniors: A Student-Led Intergenerational Intervention

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Background: Canada's aging population and cognitive impairment rates showcase the urgent need for non-pharmacological interventions that improve the quality of life for older adults. By 2040, seniors are expected to make up over 25% of the population, a rise that will place increasing demands on long-term care and mental health services. Group reminiscence therapy (GRT) is a technique that calls on seniors to reflect and share meaningful life experiences through structured recall sessions. GRT is often partnered with Art Therapy (AT), allowing patients to communicate

emotions. GRT has shown clear benefits for memory, emotional well-being, cognition, and social connection in the senior population. When partnered with AT, this treatment has been shown to create a therapeutic environment that emphasizes emotional expression, interpersonal growth, and trauma recovery. This study explores an intergenerational initiative while advocating for its integration into long-term care settings nationwide.

Methods: We are currently conducting an 8 week pilot, student-led GRT and AT program at community-based adult day program "A Rose for Grandma Wellness Hub," in Markham, Ontario and "Bethesda Home" located in Scarborough, Ontario. This intervention aims to support seniors' emotional well-being and strengthen their social connections using validated treatment measures. In addition, questionnaires will be distributed weekly, and additional assessments conducted pre- and post-intervention to monitor changes in participants' mental and emotional states.

To evaluate impact, we use the Geriatric Quality of Life (GQOL) and the Reflective Functioning Questionnaire - Adapted (RFQ-R-7), which assess life satisfaction and emotional insight. Both use a Likert format, where participants indicate how strongly they agree with specific statements. The forms are distributed, with facilitators assisting seniors in completing them before and after the intervention. Ethics approval and informed consent were obtained from all participants or their legal decision-makers prior to the start of the program. All data collected remains anonymous to ensure participant confidentiality.

Conclusion: We are currently conducting a pilot study. Once data collection is complete and client-reported outcomes are analyzed, we will be able to assess the study's impact on emotional well-being and quality of life. We anticipate formalizing the study by the end of August. It is expected that, after engaging in GRT and AT, participants will report improved emotional well-being and life satisfaction. We plan to conduct both descriptive analysis and an independent samples t-test on pre- and post-treatment responses on the GQOL and RFQ-R-7 scales to evaluate the statistical significance of the therapy's effects.

This study highlights how GRT remains under-recognized and under-promoted, despite its clear benefits, and emphasizes accessibility to all seniors. GRT, when combined with AT, is a validated and cost-effective intervention that enables seniors to reconnect with their memories in a structured way, enhancing mood, memory, and overall quality of life. In Canada, GRT remains an undervalued and unofficial intervention, without a formal training or delivery framework within the Ontario Healthcare system. We advocate policymakers to recognize GRT as a reimbursable service under OHIP and to establish certification pathways that support its widespread.

Keywords: Reminiscence Therapy, Art Therapy, Aging Population, Emotional Well-being

A Health Equity Framework for Vulnerable Seniors Living with Dementia

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Objectives: The Alzheimer Society of Ontario developed the Health Equity Framework for Vulnerable Seniors Living with Dementia to standardize a health equity approach across the Ontario Alzheimer federation of 26 local Alzheimer societies to address gaps in dementia care service delivery for older adults from priority populations.

Methods: The health equity framework is developed in 3 phases. Phase 1 involved conducting an environmental scan of health equity-based frameworks that address care gaps in vulnerable populations. Phase 2 included in-person and virtual consultations with local Alzheimer Society senior leaders to gain knowledge of the current organizational status of health equity initiatives and areas of opportunities. Consultations with subject matter experts were also conducted to gain industry perspectives on health equity and dementia. Thematic analysis was conducted to determine themes and subthemes. Phase 3, starting in summer 2025, will see the implementation of the framework across the federation, and its evaluation of uptake and efficacy in address inequities.

Results: As of spring 2025, Phases 1 and 2 were concluded. Findings revealed a deficit in organizational knowledge and capacity of health equity across all societies in program delivery and intake services, a need of system level integration, and increased community partnerships including a need for more culturally based approaches to engagement and partnership.

Conclusion: The resulting framework identified 4 organizational values, and 6 equity-related pillars to increase organizational capacity and competency to drive health equity initiatives across the federation. The 4 values were: transparent governance and leadership, person-centered care and community practices, innovation and sustainability, and equity driven policies and practices. The 6 pillars developed were data and technology, health and social systems solutions, community engagement and partnerships, care partners and allied support and communities, education and awareness, Indigenous health and dementia. These pillars, underpinned by the 4 organizational values, offer a guide for all local society federation members on how to develop health equity initiatives that includes community centered approaches. Phase 3 will see the collection of community -based data to inform organizational outreach practices and the development of internal infrastructure.

Exploring AI-Generated Personalized Digital Stories as a Tool for Reminiscence Therapy in Dementia

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Background: Dementia is a progressive condition that compromises cognitive function and emotional well-being, diminishing quality of life and sense of self. Reminiscence therapy—where individuals recall and share memories linked to specific themes—has shown promise in supporting psychological well-being, enhancing cognitive engagement, and preserving identity in people living with dementia. Traditionally, these sessions require facilitation by a therapist or caregiver, limiting their frequency and accessibility. Personalized multimedia digital stories, based on an individual's past experiences, may offer a promising way to encourage reminiscing independently, potentially replicating the positive effects of facilitated sessions.

Objective: This study explores the feasibility of using generative artificial intelligence (GenAI) to create personalized digital stories based on an individual's life history as a novel approach to reminiscence therapy for people with dementia.

Methods: To generate highly personalized multimedia digital stories, structured interviews—modeled after reminiscence therapy sessions—were conducted with cognitively healthy participants to elicit a set of personal memories. These narratives are processed by two distinct AI algorithms: (1) a large language model to identify key themes and distill memories into concise text and (2) a text-to-image generation model to produce relevant visuals. The outputs from these models were combined to create cohesive digital stories incorporating text and images. Performance was assessed using human review, with a focus on criteria such as accuracy, correctness, and succinctness (summarization quality).

Results: The study demonstrated the feasibility of generating personalized multimedia digital stories using GenAI, integrating both reminiscence therapy principles and automated storytelling techniques. Reminiscence occurred during both the structured interview process and the subsequent viewing of the completed stories, which incorporated AI-generated summaries and visuals. These stories—structured around themes such as childhood, family, traditions, and relationships—were developed through a two-step process: (1) structured interviews to gather personal memories and (2) AI-based summarization and image generation to build the story.

The AI-generated summaries were generally accurate and aligned with the original participant narratives. The summaries improved dramatically as we evolved the prompt. However, many were brief, sometimes omitting important context and events. This occasionally led to an oversimplified representation of the original memory.

The text-to-image model generated visuals that largely aligned with input captions, showing significant improvement through prompt and parameter adjustments, and when using original images as a source. However, limitations were evident: some generated images lacked key contextual details and contained artifacts or distortions, diminishing realism and emotional resonance. Refining the image generation process is necessary to meet the content and quality standards required for therapeutic applications.

Quantitative evaluations using human review confirmed that while the pipeline is functionally viable, refinement is necessary—particularly to improve fidelity, coherence, and multimodal integration. Despite these limitations, the current implementation provides preliminary support for the use of AI-generated digital stories in reminiscence-based interventions.

Conclusion: Using GenAI to automate and enhance the personalization process will enable rapid and scalable story generation for simulated reminiscence therapy sessions, without the level of human involvement needed for traditional sessions.

Investigating the Role of MEN1 Gene in Molecular Mechanisms Underlying Alzheimer's Disease in Autopsied Human Brain Tissue

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Alzheimer's disease (AD) is the leading cause of dementia, affecting over 55 million people worldwide. Despite decades of research, AD etiology remains unclear, with therapies targeting amyloid β and tau pathology showing limited success. This underscores the need to explore alternative mechanisms. Synaptic dysfunction is one of the earliest pathological features of AD, particularly in cholinergic circuits in the hippocampus and cortex. As such, the cholinergic hypothesis attributes AD-related cognitive decline to impaired cholinergic synaptic integrity, yet the molecular regulators of this vulnerability remain unclear. Menin, a protein that modulates synaptic plasticity has been implicated in cholinergic signaling crucial for learning and memory.

To investigate the role of menin in AD-related synaptic pathology, we analyzed human postmortem hippocampal and cortical brain tissue with immunohistochemistry and quantified synaptic (synaptophysin, PSD-95) and AD-related (tau, menin) biomarkers. We found significantly reduced PSD-95 expression in AD samples, indicating synaptic loss. Menin was also diminished, correlating with synaptic alterations

and increased tau accumulation. Strong tau-menin colocalization in both AD and control samples suggests a potential interaction in disease progression.

These findings highlight menin as a potential regulator of cholinergic synapse vulnerability. By measuring protein alterations in human AD brain tissue, this study provides key insights into AD pathogenesis and suggests new avenues for therapies targeting synaptic resilience in AD.

Comparing Behavioral Symptoms in Vascular and Neurodegenerative Dementias Using the Mild Behavioral Impairment Checklist

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Background: Behavioral and psychological symptoms frequently co-occur with cognitive decline and may vary by dementia etiology. The Mild Behavioral Impairment Checklist (MBI-C) is a brief, validated tool designed to capture late-onset neuropsychiatric symptoms that may signal neurodegenerative disease. However, the utility of the MBI-C in distinguishing behavioral symptom patterns across cognitive disorders has not been fully established. This study aimed to examine MBI-C total and domain scores across patients with different cognitive diagnoses to determine whether behavioral symptom profiles differ meaningfully by diagnosis group.

Methods: We conducted a prospective cohort study using data from the PROMPT registry, which includes patients referred for cognitive assessment at two tertiary memory clinics in Calgary, Alberta. Diagnoses included Alzheimer's disease (AD), behavioral variant frontotemporal dementia (bvFTD), Lewy body dementia (LBD), mixed AD/vascular dementia, vascular dementia (VaD), MCI due to vascular disease (MCI-VCI), or MCI not otherwise specified (MCI-NOS), using standard diagnostic criteria. MBI-C total and domain scores (apathy, mood/anxiety, impulse dyscontrol, social inappropriateness, and psychosis) were derived. Negative binomial and logistic regressions were used to model symptom severity and presence, respectively, controlling for age and sex, using AD as the reference group.

Results: A total of 489 patients were included (median age 71, IQR: 64-78; 52% male). Median MBI-C total scores varied by diagnosis: bvFTD (26 [IQR: 13-34]), VaD (18 [13-29.5]), LBD (15 [6.75-30.25]), AD (14 [7-27]), mixed dementia (13 [4-26]), MCI-NOS (12 [4-24]), and MCI-VCI (7 [2-15]). Compared with dementia due to AD, the MBI-C total score was lower in the MCI groups (adjusted incidence rate ratio [aIRR] for MCI-NOS: 0.78, 95% CI=0.63-0.97, p=0.025; vascular MCI: 0.60, 95% CI=0.42-0.86, p=0.004) but did not differ in any of the dementia subtypes. Regarding MBI domains, MCI-NOS and vascular MCI had significantly lower scores in apathy (MCI-NOS: aIRR=0.68, 95% CI=0.53-0.88, p=0.003; vascular MCI: aIRR=0.55, 95% CI=0.37-0.85, p=0.005) than AD-dementia, and MCI-VCI also showed lower impulse dyscontrol (aIRR=0.61, 95% CI=0.41-0.95, p=0.022). Compared with AD, bvFTD had higher odds of social inappropriateness (adjusted odds ratio [aOR]=3.23, p=0.016), while LBD (aOR=0.25, 95% CI=0.08-0.67, p=0.009) and MCI-NOS (aOR=0.47, p=0.001) had significantly lower odds. LBD had increased odds of psychosis (sOR=2.62, p=0.033), while MCI-NOS had significantly lower odds (aOR=0.44, p=0.002).

Conclusion: These findings indicate that the MBI-C captured behavioral and psychological symptoms of cognitive disorders with greater symptom burden in dementia than MCI. Although overall symptom burden was largely comparable among the dementia groups, subtype-specific variation was seen in MBI-C domains, with higher social inappropriateness in bvFTD and higher psychosis in LBD. The MBI-C shows potential as a tool for behavioral profiling in clinical populations and may support the identification of behaviorally distinct phenotypes. However, its use in differential diagnosis will require integration with other clinical and cognitive assessments.

Evaluating the Impact of Smoking on the Development of Dementia

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Background: Dementia rates are rapidly growing, affecting over 57 million people worldwide, of which 60% of cases present in low-to-middle income countries (LMICs). Smoking is a modifiable risk factor that increases the risk of developing dementia. Notably, 80% of tobacco users live in LMICs, indicating a major disparity and underscoring the relation between smoking and dementia. Further, long-term smoking puts one at a higher risk of developing dementia - an alarming concern for many young to middle-aged smokers. One of the main barriers is that approximately 40% of smokers are in the pre-contemplation phase of smoking, meaning they have no intention to quit smoking. An additional 40% of smokers are in the contemplation phase where they understand the health impacts of smoking but have no concrete plans to begin their quit journey. As such, smoking-related dementia rates are on the rise.

The Ottawa Model for Smoking Cessation (OMSC) Program employs a multi-faceted and evidence-based approach to assist people on their journey to quit smoking. This is done by implementing a holistic systematic approach, which

includes identification and documentation of smokers, strategic advice, pharmacotherapy, and follow-up. The OMSC conducts innovative clinical trials designed to help smokers not yet ready to quit. Given the well-established link between dementia and smoking, there is an urgent need to expand these methodologies and cessation approaches to reduce the number of global smokers and the burden of dementia.

Methods: Building on the 2024 Lancet Commission's identification of 14 common dementia risk factors – including smoking - we conducted a comprehensive review, identifying 56 total factors. We searched PubMed, Google Scholar and the National Cancer Institute with our primary outcome of interest being factors associated with an increased risk of dementia. Artificial Intelligence (AI) and machine learning were used to further analyze databases to establish specific relationships between smoking and an increased risk of dementia.

Results: Our review identified consistent results, linking smoking to increased risk of dementia. In particular, smoking was found to increase the risk of many forms of dementia such as Alzheimer's Disease, vascular dementia, and all-cause dementia, with hazard ratios ranging between 1.2 and 2.6. Given these results, there is an immediate and growing need to address strategies to promote smoking cessation in order to mitigate increased rates of dementia.

Conclusion: Our comprehensive review highlighted smoking as a prominent risk factor in the development of dementia, particularly in LMICs. Given that long-term smoking increases risk of dementia, there is a clear and present need to promote cessation strategies - particularly amongst youth and middle-aged adults - that in turn would mitigate the risk of dementia. Expanding programs like the OMSC on a global scale could help bridge this gap and inform further research and clinical practices.

Expanding the Dementia Prevention Landscape: A Narrative Review of Traditional and Underrecognized Risk Factors

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Background: Dementia is a major global health challenge, placing immense strain on individuals, caregivers, and healthcare systems. Prevention research, notably the 2024 Lancet Commission's identification of modifiable risk factors, has shaped public policy and clinical practice. However, this work has focused primarily on well-researched risk domains. This narrative review identifies several understudied yet clinically significant dementia risk factors. We examined 56 risk factors, with an emphasis on underrepresented domains, including critical illness (ICU stays, delirium), severe psychiatric conditions (schizophrenia, psychosis), long-term medication exposures (antipsychotics, benzodiazepines), and complex psychosocial and cognitive factors (social isolation, multilingualism, musical training), among others. We combined traditional research methods with artificial intelligence (AI) based machine learning to extract and confirm dementia risk factors with associated risk magnitudes.

Methods/Overview: We conducted a narrative literature review to evaluate dementia risk factors beyond those emphasized by the Lancet Commission framework. Using PubMed, Google Scholar, and the National Cancer Institute (NCI), we identified peer-reviewed studies, prioritizing high-impact journals in neurology, psychiatry, gerontology, and epidemiology. Risk factors were categorized into five thematic domains: Biological and Genetic, Vascular and Metabolic, Lifestyle, Psychosocial and Cognitive, and Medication and Environmental. Each study was assessed for methodological rigor, statistical clarity, and strength of findings. Hazard ratios (HRs) were extracted to enable comparison across risk factors and quantify their relative association with dementia risk. To complement the manual review, we applied machine learning methods for literature-based data extraction. The AI model drew from both indexed and less accessible sources, enabling comparative analysis between the two approaches.

Results: Our synthesis revealed strong dementia risk associations across both traditionally recognized and newly emphasized domains. While the review encompassed 56 distinct factors, select findings illustrate the diversity of risks. Traditional predictors such as depression (HRs 1.8-3.0) and hypertension (HRs 1.5-1.9) reaffirmed findings from the 2024 Lancet Commission. Notably, schizophrenia (HRs 2.6-2.9; HR 14.5 for midlife onset), very-late-onset psychosis (HRs 4.2-4.9), anxiety onset before age 70 (HRs 4.6-7.2), early-life depression (HRs 3.0-3.1), intensive care unit (ICU) stays (HRs 1.6-2.2), and long-term exposure to antipsychotics (HRs 1.6-1.8) were associated with a significantly increased risk of dementia. These patterns may inform the design of more personalized and multifactor prevention strategies. Across the reviewed literature, substantial evidence gaps remain, including limited causal understanding, minimal interventional research, and lack of long term data to support clinical decision making.

Conclusion: This narrative review highlights the overlooked yet clinically relevant contributors to dementia risk, encouraging a reassessment of current prevention frameworks. By evaluating a broad and diverse set of potential risk factors across biological, psychosocial, environmental, psychiatric, and systemic domains, our findings suggest new directions for targeted prevention, screening, and policy. Our approach demonstrates how AI can complement traditional review methods and support broader integration of machine learning into preventive dementia research.

Novel Rare Variants in MAPT-related Genetic FTD Contribute to Symptomatic Presentation and Age of Onset: A Genome-Wide GENFI Study

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Background: The substantial heterogeneity in clinical presentation of genetic Frontotemporal Dementia (FTD), even within the same family suggests that additional heritability may exist and contribute to this variable presentation.

Objective: To examine if gene-based aggregate burden of genome-wide rare variants (minor allele frequency ≤1%) contribute to variation in genetic FTD after controlling for effects of causative mutations in C9orf72, GRN, and MAPT.

Methods: This case-control study was embedded within the GENetic Frontotemporal dementia Initiative (GENFI) - a prospective multi-centre international cohort, which recruits symptomatic genetic FTD cases and their unaffected family members, both at-risk asymptomatic carriers of FTD mutations and non-carriers. 308 participants (103 cases; 205 controls) were included. Cases were defined as symptomatic mutation carriers and carriers who converted to clinical FTD during follow-up; controls were defined as at-risk asymptomatic individuals carrying causative mutations. Data were genotyped on the NeuroChip and imputed against TOPMed. Aggregate burden of loss of function (LOF) rare variants across the genome was compared between cases and controls using RVTests. Analyses were adjusted for age, sex, FTD mutation, TMEM106B-rs1990622G dosage, principal components (i.e., population stratification) and the kinship matrix (i.e., relatedness). Annotations for loss of function mutations (LOF): start gain, stop loss, start loss, essential splice site, stop gain, normal splice site, and non-synonymous. Multiple testing correction accounted for the number of genes tested (P-value threshold: $0.05/15{,}822 = 3.16 \times 10^{-6}$).

Results: Cases had significantly higher odds of having greater aggregate burden of LOF mutations in the following genes: CARNMT1, ERAL1, HOXA2, PCTP, POLR2A, TOMM22, OR10J1, SNORD20, ACSL6, MRPL50, CCDC28A, ACR, PINLYP. Two cases had a LOF mutation in the PCTP gene (MAPT haplotype H1/H2) and are full siblings. One case (singleton) carried a LOF mutation in all 13 genes (MAPT haplotype H1/H1) and showed significantly earlier age of onset (38 years) compared to the family age of onset of 52 years. All three cases had a MAPT mutation and had a clinical diagnosis of behavioural variant FTD. All but two genes (antisense RNA and pseudogene) are protein coding and variably expressed in the brain.

Conclusions: Identification of novel rare variants that segregate in individuals with autosomal dominant genetic FTD may explain variability in clinical onset of symptomatic disease and age of onset.

Longitudinal Functional Connectivity Changes in the Resting State Networks of Genetic Frontotemporal Dementia Carriers

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Background/Objectives: Frontotemporal dementia (FTD) is a clinically and genetically heterogeneous neurodegenerative disorder and a leading cause of young-onset dementia. The majority of familial cases are caused by mutations in *C9orf72*, *GRN*, or *MAPT* genes. While pathologically distinct, these mutations often lead to the behavioral variant of FTD (bvFTD), characterized by deficits in social cognition. Resting-state functional MRI (fMRI), a non-invasive imaging technique, allows for the investigation of functional network connectivity, including that of the salience network implicated in FTD-related behaviours. However, longitudinal changes in functional connectivity, especially during the crucial presymptomatic phase across the main genetic subtypes of FTD, remains poorly investigated. This study aimed to characterize and compare longitudinal functional connectivity changes in presymptomatic and symptomatic carriers of the three major FTD genetic subtypes.

Methods: We included presymptomatic (n = 400) and symptomatic (n = 197) carriers of *C9orf72*, *GRN*, and *MAPT* mutations, along with family-based controls (n = 362) from the GENetic Frontotemporal Dementia Initiative (GENFI) multi-site, longitudinal cohort. Spatial preprocessing of BOLD fMRI data was performed using fMRIPrep, yielding data in MNI space at 2mm isotropic resolution, smoothed with a 4mm FWHM kernel. Temporal preprocessing involved a comprehensive nuisance regression model, including regressors for head motion, physiological signals, ICA-based noise components, and temporal filtering via discrete cosine transform signals. Harmonized data was achieved using the LongCombat algorithm to mitigate site and scanner effects. We employed linear mixed-effects models to assess longitudinal changes in functional connectivity within canonical resting-state networks. Models were adjusted for age and sex as fixed effects, with family membership and subject as random effects. P-values were adjusted for multiple comparisons using Bonferroni correction.

Results: Presymptomatic carriers of all three genetic subtypes (*C9orf72*, *GRN*, and *MAPT*) exhibited a significant longitudinal decline in functional connectivity within the salience network (β range = -0.009 to -0.018, $p < 0.05$) and the cingulo-opercular network (β range = -0.007 to -0.011, $p < 0.05$) relative to controls. Gene-specific changes were also observed; presymptomatic *C9orf72* and *GRN* carriers showed a significant decline in the dorsal attention network (β range = -0.006 to -0.008, $p < 0.05$), a pattern not seen in *MAPT* carriers. At the symptomatic stage, carriers of *C9orf72* and *GRN* mutations showed widespread baseline decreases in functional connectivity across most networks. Post-hoc analyses revealed that, relative to controls, significant functional connectivity decline in the salience and cingulo-opercular networks could be detected in *C9orf72* and *GRN* carriers as early as one year from baseline.

Conclusions: Our findings demonstrate that progressive decline in functional connectivity within the salience and cingulo-opercular networks is an early feature across the major genetic forms of FTD, detectable even in the presymptomatic phase. Furthermore, we identify gene-specific longitudinal changes, with divergent trajectories in the dorsal attention network between FTD genetic subtypes. These results establish resting-state functional connectivity as a promising non-invasive biomarker for tracking disease progression and dissecting pathophysiological mechanisms in genetic FTD. These markers hold potential for patient stratification and as outcome measures in future clinical trials targeting the presymptomatic stage of FTD.

Characterizing Cognitive Heterogeneity Across the Neurodegenerative Disease Spectrum: A Latent Profile Analysis in the COMPASS-ND Cohort

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Background: Mixed pathologies are common across the neurodegenerative dementia spectrum, contributing to significant heterogeneity in the disease presentation and

progression. Identification of transdiagnostic cognitive phenotypes (which may indicate distinct underlying neurobiological dysfunctions) can help characterize this heterogeneity by highlighting shared pathways. In this study, we undertake a data-driven approach to elucidate cognitive phenotypes or subtypes across the dementia spectrum in a transdiagnostic manner.

Methods: We analyzed the baseline neuropsychological data from the Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) cohort (n=1157, mean [SD] age=71.9 [7.5] years), for the following groups: cognitively unimpaired (CU, n=177), subjective cognitive impairment (SCI, n=159), mild cognitive impairment (MCI, n=375), Alzheimer's disease (AD, n=142), AD/MCI with extensive cerebrovascular disease (n=85), Parkinson's disease (PD, n=84), PD with MCI or dementia (PD-MCI/PDD, n=90), and patients along the frontotemporal dementia-amyotrophic lateral sclerosis spectrum (n=45). A total of 19 indicator variables representing the five cognitive domains (memory, executive, language, visuospatial, and attention and working memory) were selected and adjusted for age and years of education. Missing data were imputed using MissForest, an iterative method in R that predicts missing values using random forests algorithm. Latent profile analysis (LPA) was then performed using tidyLPA, a model-based clustering approach that identifies homogenous latent subgroups. A series of models specifying one to twelve latent profiles were evaluated. The optimal number of clusters was determined based on fit indices and conceptual interpretability. We subsequently compared the demographic, plasma biomarker and structural neuroimaging phenotypes between the identified cognitive subtypes using analysis of variance and Fisher's exact tests.

Results: The LPA revealed 6 distinct clusters, as following (ordered by increasing severity of deficits in the memory domain): 1) minimal to no cognitive deficits ("cognitively preserved", n=233), 2) memory relatively spared with mild deficits in the non-memory domains ("mild non-memory deficits", n=315), 3) memory mildly affected with mild-to-moderate decline in other domains ("mild global impairment", n=191), 4) memory moderately affected with mild deficits in other domains ("moderate memory-dominant deficits", n=186), 5) memory severely affected with moderate decline in other domains ("moderate global impairment", n=148), and 6) memory severely affected with severe deficits in the other domains ("severe global impairment", n=84). These clusters represented the cognitive spectrum well. For example, 70.4% of cases in Cluster-1 were CU/SCI, while 92.6% in Cluster-5 were AD/MCI ± cerebrovascular disease, and PD-MCI/PDD. All clusters were associated with distinct demographic, plasma biomarker and neuroimaging profiles. For example, Cluster-5 (versus Cluster-1) was characterized by, 1) lower amyloid-beta 42/40 ratio, 2) higher phosphorylated-tau 181, neurofilament light chain, and glial fibrillary acidic protein levels, 3) greater cortical atrophy and elevated white matter lesions, and 4) higher AD polygenic risk score and apolipoprotein-E e4-allele dosage. This cluster may thus represent a distinct AD "biotype" potentially driven by shared mechanisms across the associated disorders.

Conclusion: These findings demonstrate that defining homogeneous, clinically meaningful cognitive phenotypes may help to characterize not only the diagnostic category-specific patterns, but also transdiagnostic overlap across a diverse dementia cohort. Future work to validate these results in an independent longitudinal cohort is warranted.

A Clinician's Experience of Promoting Intentional Music Listening for Patients with Cognitive Impairment and Dementia

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Background: As neurologists, we have limited medication options to offer our patients with neurodegenerative dementias, but we are in a position to promote brain health for our patients. Many of us recommend activities that can improve cognitive reserve, such as mental, physical and social exercise, and managing sleep, mood and stress. However, there is evidence that >35% of patients don't adhere to many "brain health" recommendations, particularly physical activity, mood management, cognitive activity and sleep. There is a wealth of evidence for the benefits of music on many aspects of life, including for patients with cognitive decline, and yet the introduction of this type of brain health activity, despite its ease of access, rarely makes it onto our recommended "to do" lists. I have begun introducing the concept of "intentional music listening", based on the Bonny method of music and imagery therapy, to my patients in cognitive clinic. The initial goals are to determine whether this concept can be easily conveyed within a normal clinic visit and whether patients and caregivers are receptive to the idea.

Overview: I introduce the concept of intentional music listening by emphasizing that this is not simply turning on background music. Instead, there is a focus and attention on a specific piece of personalized music, one that is meaningful, calming, inspiring, or memory-laden, which the patient can choose based on their current or desired state of being. Then they are to dedicate time and attention to listening. They may want to dance or draw during the music, as guided by the music, or simply sit and let the music do the work.

Results: Out of 30 patient encounters to date, only 1 was met with ambivalence (a case in which the patient had been raised in a cult with no allowance for music or dance into his 20s). The remaining all expressed interest and, in many cases, joy at the thought of being able to be with their music, and share

the music with their loved ones. The concept of intentional music listening was readily accepted and easily explained in less than 2 minutes, which does not overwhelm the clinic visit timing.

Conclusions: Music has the potential to be a well accepted brain health option for patients with cognitive decline. However, rather than simply recommending that people "listen to music", it is important to understand the personalized psychological impact of specific pieces. Music "prescriptions" need to be more personalized than an exercise regimen. Beyond effects on neuroplasticity, music can increase awareness of thoughts, feelings, connection to self and to others. It is the intentional listening to personal music that brings wellness. I hope more neurologists will take the time to promote music as a meaningful therapy and start including intentional music listening as a brain health option in the pillars of brain health. Follow-up studies will examine the rates of adherence to music suggestions and subjective experiences of the same.

Toward a National Model for Dementia Care: Integrating Dementia-Friendly Practices, Specialized Care, and Community Collaboration

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Background/Objectives: As the prevalence of dementia continues to rise, health organizations must move beyond reactive initiatives and adopt intentional, co-designed strategies that meaningfully improve care for individuals living with dementia and those who support them. Bruyère Health, an academic health organization specializing in aging, rehabilitation, and complex care, has developed an innovative Dementia Strategy aimed at positioning the organization as a regional, provincial, and national leader in dementia care over the next 15 years. The strategy focuses on delivering compassionate, person-centred care while empowering those who provide support to individuals living with dementia.

Methods: From December 2024 to March 2025, Bruyère Health undertook a multi-phase participatory design process to co-develop the strategy. This process engaged diverse groups, including clinical and corporate teams, community partners, and individuals with lived experience, through iterative engagement sessions. Co-led by operational and clinical leaders, the strategy was informed by thematic analysis of stakeholder input, a literature review, and organizational data. Strategic alignment was ensured through integration with existing initiatives and endorsement from senior leadership.

Results: The development process produced a multipronged strategy aligned with three strategic pillars: (1) organization-wide dementia-friendly practices, (2) leading-edge specialized care, and (3) collaboration and system integration with community partners. Key components include a corporate engagement model embedding dementia awareness into staff training, wellness, and operations; a dementia-friendly infrastructure plan grounded in universal design and cognitive accessibility; a research and innovation agenda supported by the Bruyère Health Research Institute and academic partners; and an organizational roadmap focused on early diagnosis, caregiver support, and evidence-informed care. An annual call-for-projects mechanism was also designed to foster innovation, buy-in and accountability across clinical and corporate departments. While implementation is forthcoming, these strategic elements position the Bruyère Health Dementia Strategy to build on clinical strengths and lead in dementia care, research, and provider support across the health system.

Conclusions: Bruyère Health's Dementia Strategy represents a scalable, systems-based approach that integrates clinical excellence, organizational culture, and community engagement. By embedding dementia-friendly practices throughout the organization and aligning with national priorities, Bruyère is advancing a replicable model for health systems across Canada. Future work will focus on implementation, evaluation, partnership expansion, and contributions to provincial and national policy development.

Bioactive ROS-responsive Nanotherapeutics Attenuate Intermittent Hypoxia-induced Cognitive Impairment via NRF2/KEAP1/HO-1 Signaling

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Background: Obstructive sleep apnea (OSA), characterized by chronic intermittent hypoxia (IH), leads to excessive reactive oxygen species (ROS) accumulation and neuronal apoptosis, ultimately resulting in progressive cognitive decline. Given the limited efficacy of standard treatments such as continuous positive airway pressure (CPAP) in mitigating oxidative damage and neurocognitive deficits, there is an urgent need for novel therapeutic strategies targeting redox imbalance.

Objective: To evaluate the neuroprotective effects and underlying mechanisms of the ROS-responsive nanoparticle TPCD NP in alleviating IH-induced cognitive impairment.

Methods: TPCD NP was synthesized via covalent conjugation of Tempol and phenylboronic acid pinacol ester to a β-cyclodextrin backbone, followed by nanoprecipitation to obtain uniform ROS-responsive nanoparticles. IH-induced cognitive impairment models were established in rats and HT22 neuronal cells. Therapeutic efficacy was assessed

through behavioral tests, histological staining, oxidative stress assays, flow cytometry, immunofluorescence, and Western blotting.

Results: TPCD NP significantly improved spatial memory, preserved hippocampal neuronal architecture, and reduced oxidative stress and apoptosis in IH-exposed rats. Mechanistically, it activated the NRF2/KEAP1/HO-1 signaling cascade by enhancing NRF2 nuclear translocation, downregulating KEAP1, and upregulating HO-1. These effects were abolished by ML385, confirming pathway dependence.

Conclusion: TPCD NP confers antioxidative and anti-apoptotic protection against IH-induced neurodegeneration, offering new insights for therapeutic intervention in OSA-related cognitive impairment. These findings highlight the translational potential of ROS-responsive nanomedicine in redox-targeted neuroprotective strategies.