## Annual Report to the LABARGE GIFT BOARD



BRIGHTER

**WORLD** 

2018

LABARGE ptimal Aging

Labarge Centre for Mobility in Aging

Institute for Research on Aging





was created in 2016 to facilitate and amplify research initiatives that mitigate the risk and consequences of declining mobility with age. Situated within the McMaster Institute for Research on Aging, and built on the groundwork supported by the Labarge Optimal Aging Initiative and the Labarge Foundation. the Centre fosters interdisciplinary research approaches to all aspects of mobility in aging. Through the generosity of Suzanne Labarge, McMaster's strength in aging research has been magnified with the aim of developing evidencebased interventions that will impact the lives of today's aging population.

## Patrick Deane

The topic of aging has been adopted across the University as both a strategic research priority and an educational opportunity. Because of the vision and generosity of Suzanne Labarge, today's older adults are better informed while making health-related decisions and better supported to achieve their aspirations as they age.

By bringing together the unique and complementary perspectives of researchers across disciplines alongside those of older adults, we have both enhanced and accelerated the impact of our research in aging. I invite you to read more about our progress in this year's report. I am proud to be part of the McMaster team as it continues to transform the aging experience for people in Canada, and around the world.

Dr. Patrick Deane President and Vice-Chancellor

### Susan Denburg

It is my pleasure to invite you to review the progress in aging research at McMaster University. After only two years, the Labarge Centre for Mobility in Aging, situated within the McMaster Institute for Research on Aging, has supported dozens of research projects and student trainees, and has gained recognition for McMaster as a national leader in aging research and knowledge translation.

Now on the cusp of launching its two large scale research initiatives, the Centre is breaking new ground through its approach to supporting interdisciplinary research and stakeholder engagement. The impact of the investments that have been made by Suzanne Labarge has been transformational, and will only continue to grow in the years ahead.

Lusa Denling

Dr. Susan Denburg Executive Vice-Dean and Associate Vice-President, Academic, and University Lead, Labarge Centre for Mobility in Aging and McMaster Institute for Research on Aging

### Parminder Raina

At the Labarge Centre for Mobility in Aging and the McMaster Institute for Research on Aging, our goals are to build capacity in aging research and education, establish new partnerships, position McMaster researchers for success in funding competitions, and enhance our reputation for excellence in research and knowledge translation.

The progress outlined in this report has been enabled by the strong, team-based culture we have developed, which is built upon our shared commitment to advancing research and knowledge sharing activities focused on aging, and has been supported by the generosity of Suzanne Labarge. This culture, commitment and investment position us well to respond to opportunities and gain recognition for McMaster as a powerhouse in aging research.

alosinde

Dr. Parminder Raina Scientific Director of the Labarge Centre for Mobility in Aging and the McMaster Institute for Research on Aging

## MIRA and the Labarge Centre for Mobility in Aging: 2018 in Review





\*Values reported are cumulative except for Leveraged Funds, which are reported per year

(5)

## Labarge Optimal Aging Initiative

The Labarge Optimal Aging Initiative has provided seed funding to support interdisciplinary teams investigating health or social topics related to aging. Since its launch in 2012, the Initiative has funded 26 research projects, including 21 cross-Faculty or crossdepartment collaborations. These opportunities have allowed McMaster researchers to develop robust research projects that have translated to longer-term partnership opportunities.



## Defining the optimal combination of exercise and nutrition for maximizing muscle mass and mobility in aging

Traditional resistance exercise training is known to be an effective intervention to increase skeletal muscle mass and strength in older adults, even in very advanced age. High intensity interval training has also recently been shown to be an effective approach for improving muscle and overall health. Before the Labarge Optimal Aging Initiative, the combination of these exercises to promote health in an aging population had never been investigated. Additionally, adequate nutrition is necessary to maintain muscle health achieved with regular exercise. A significant component of the project funded through the Labarge Optimal Aging Initiative was the development and testing of a novel nutritional supplement designed specifically for older adults. Our goal was to develop and test a unique exercise-training and nutritional program designed to optimize the response to exercise-training in older adults. Outcomes included an assessment of muscle mass and function as well as cognitive function. This project resulted in five published manuscripts and one additional manuscript in preparation for submission, as well as training opportunities for one post-doctoral fellow, two graduate students, and 11 undergraduate students.

### Investigators

Gianni Parise Stuart Phillips

"The results of our testing were so compelling that we filed a patent on the nutritional formulation and have partnered with a company to bring this product to market. It is anticipated that this product will be available to the public in early 2019."

Gianni Parise

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#### PART 1: LABARGE OPTIMAL AGING INITIATIVE | PROJECT UPDATES



### Pilot study of a tailored home balance exercise program for reducing falls in older adults with chronic obstructive pulmonary disease

### Investigators

Marla Beauchamp Dina Brooks Roger Goldstein Stewart Pugsley Julie Richardson Chronic obstructive pulmonary disease (COPD) is an age-dependent respiratory condition affecting approximately 1.5 million Canadians. While respiratory impairment is the hallmark of the disease, people with COPD also have significant balance problems and a high risk of falls. Annual fall rates in COPD are estimated to be up to five-fold higher than in older adults and are linked with an increased risk of injury and death. This research project continues to explore the feasibility and preliminary effects of a six-month home balance exercise program for reducing falls in older adults with COPD. The project is in its third year and recruitment is more than 85 per cent complete. The team expects this study to be completed by Spring 2019. This pilot study has informed the design of a CIHR-funded international multi-centre trial of fall prevention for older adults with COPD who are at risk of falling.

"Labarge funding provided an opportunity for our team to embark on the first study of home-based fall prevention in older adults with COPD by investigating the feasibility and preliminary efficacy of a tailored home balance exercise program for this population."

**Marla Beauchamp** 

#### PART 1: LABARGE OPTIMAL AGING INITIATIVE | PROJECT UPDATES



## Identifying optimal combinations of nonpharmacological interventions for the prevention and management of osteoporosis and osteoarthritis complications in the elderly: A Bayesian network meta-analysis

Using novel statistical methodology, we synthesized findings of multiple primary studies that looked at a number of interventions to reduce pain and boost physical function in older patients with osteoporosis and osteoarthritis. Our results showed that a combination of strengthening exercises, aerobic exercises, self-management training, and dieting for weight loss was the most optimal combination of interventions for reducing both pain and physical dysfunction.

### Investigators

Joseph Beyene Julie Richardson Parminder Raina Binod Neupane Russell de Souza Alexandra Papaioannou Aliya Khan

"Funding from the Labarge Initiative allowed us to conduct an innovative evidence synthesis. We aim to use our findings to inform the ways in which older patients with osteoporosis can best manage pain and physical dysfunction."

**Joseph Beyene** 

#### PART 1: LABARGE OPTIMAL AGING INITIATIVE | PROJECT UPDATES

From left to right: Susannah Watson, Sarah Neil-Sztramko, Julie Richardson, Maureen Dobbins, and Jenna Smith

## Evaluating the impact of the McMaster Optimal Aging Portal on knowledge, behavioural intentions and health behaviours related to physical mobility

### Investigators

Maureen Dobbins Sarah Neil-Sztramko Julie Richardson Jenna Smith Susannah Watson The McMaster Optimal Aging Portal was launched in 2014 to increase public access to trustworthy health information. The Portal helps readers to access evidence-based resources, identify trustworthy messages and understand scientific findings. The aim of this study was to understand if and how using the Portal changes what people know and do to stay healthy and mobile. The team randomized 510 individuals across Canada to a 12-week intervention or control group. The intervention featured tailored weekly email alerts providing information about maintaining and improving mobility, as well as a study-specific hashtag for Twitter and Facebook. Overall, participants in both groups increased their physical activity throughout the 12-week study period. The increased physical activity was sustained three months after the study was complete. There were no differences between the intervention and control group, however the majority of control group participants reported using the Portal on their own to seek out health information. In qualitative interviews, participants reported using Portal information as an important 'nudge' to participate in healthy lifestyle behaviours such as increasing their physical activity.

"Funding from the Labarge Initiative has helped us to conduct the first evaluation of the McMaster Optimal Aging Portal to understand the impact it may have on the health of users."

Sarah Neil-Sztramko

#### PART 1: LABARGE OPTIMAL AGING INITIATIVE | PROJECT UPDATES



## Preventing hip fractures in older adults by mapping subject-specific finite element models

Hip fractures are a significant cause of morbidity and mortality for older Canadians. Clinical diagnosis of osteoporosis (and correspondingly fracture risk) is done using dual-energy X-ray absorptiometry (DXA) scans; however, these have been shown to be poorly correlated with actual fracture risk. A new method for evaluating risk would allow clinicians to identify older adults who are at greatest risk of hip fractures from falls, and implement protective devices and medications before they sustain these devastating injuries. The team is using numerical modeling and image processing techniques to tackle this problem. They have scanned cadaveric femurs using DXA imaging and added load until they broke, thereby simulating a fall. They have been able to identify 'modes' (combinations of geometric and strength measures) that can be used to identify hips with lower force-to-failure. They are currently working towards evaluating these findings with a clinical data set, and anticipate this to be a valuable future tool for clinicians to better help their older patients retain their independence and mobility by avoiding these injuries.

### Investigators

Cheryl E. Quenneville

"The Labarge Initiative funding has facilitated the development of improved methods for identifying older adults at greatest risk of sustaining a hip fracture in the case of a fall so that protective measures can be implemented."

**Cheryl E. Quenneville** 

#### PART 1: LABARGE OPTIMAL AGING INITIATIVE | PROJECT UPDATES

From left to right: Rebecca Ganann, Alfonso lorio, Cynthia Lokker, and Stephen J. Gentles

## Co-design and production of a user-optimized communication toolbox for delivering research evidence to older adults

### Investigators

Alfonso lorio Rebecca Ganann Stephen J. Gentles Ruta Valaitis Cynthia Lokker

The optimal characteristics for information products that deliver health content to older adults and their caregivers have not been previously defined. This study aimed to: 1) use a co-design process to explore how older adults access trusted health information in their everyday lives and to identify their needs as content users; 2) design and produce a communication toolbox (i.e., a set of information product prototypes) for enhancing health content delivery; and 3) conduct a preliminary evaluation of both the usability of the prototypes and the engagement of older adults in the co-design process. The study used a novel persona-scenario approach to engage older adults in co-designing communication strategies that broadly consider their needs in delivering high quality health content. A diverse sample of 18 older adults participated in the persona-scenario co-design process; a sub-sample of six contributed to the preliminary evaluation. From the scenarios created by the participants, themes were identified using qualitative analysis. These themes were used to identify user requirements, which were then converted to specifications that informed the design of the toolbox. The toolbox products included two information product prototypes and a knowledge translation (KT) plan for enhancing delivery of pre-appraised health content on the McMaster Optimal Aging Portal website. To conduct preliminary usability testing of the prototypes and evaluate the co-design process, a think-aloud exercise, eye tracking analysis and structured surveys were used. Design specifications and dissemination strategies derived from this research may be useful to inform other KT initiatives targeting older adults and their caregivers.

"Funding from the Labarge Initiative has fostered a better understanding of the information needs of community-dwelling older adults in Canada and how they access trusted health information to support aging-in-place. This study can inform knowledge translation approaches used by researchers and providers when working with older adults and their caregivers."

**Rebecca Ganann** 



### Optimal prescribing to enhance mobility among seniors: A GeriMedRisk-TAPERMD collaboration

Multiple diseases, polypharmacy (taking multiple medications) and age predispose seniors to drug toxicity, which increases the risk of mortality and impairs mobility and cognition. GeriMedRisk-TAPERMD is a comprehensive multilevel approach to polypharmacy that integrates a geriatric pharmacology consultation service, GeriMedRisk with TAPER, a clinical pathway for systematic medication reduction that incorporates teamwork between patient pharmacist and physicians. It integrates patient priorities, electronic screening for potentially harmful medicines, supporting evidence tools and a monitoring pathway to support medication reduction. This project is studying the feasibility of this approach to polypharmacy in a long-term care setting. Specifically, the team hopes to assess the potential to reverse polypharmacy-associated mobility impairment following de-prescribing using the GeriMedRisk-TAPERMD approach.

### Investigators

Joanne Ho Dee Mangin Andrew Costa Gordon Guyatt Anne Holbrook Reza Mirza Julie Richardson Justin Lee Lehana Thabane Kristina Frizzle

"Funding from the Labarge Initiative has allowed GeriMedRisk to spread its interdisciplinary geriatric clinical pharmacology and psychiatry service, empowering clinicians to optimize prescribing to their older patients through consultation and knowledge translation."

Joanne Ho

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#### PART 1: LABARGE OPTIMAL AGING INITIATIVE | PROJECT UPDATES



## Staying mobile: Age-related enhancement of multisensory integration

## Investigators

Martin von Mohrenschildt Judith M. Shedden For older drivers, maintaining safe, independent mobility is vitally important for self-sufficiency, quality of life and self-esteem. How do good drivers adapt to maintain safe performance on the road as they age? Can we identify key aspects of behaviour to improve adaptation for other drivers? This team uses physiological and brain-imaging techniques in a multisensory (visual, auditory, proprioceptive, and vestibular) driving simulator to examine how age-related enhancement of multisensory integration may be critical for older drivers. The team looks at behavioural and brain responses while drivers navigate through familiar and unfamiliar spaces, interact with pedestrians and other vehicles and respond to physical motion such as acceleration, turning rotation and bumpy roads. An understanding of the neural and behavioural changes involved in driving and aging will lead to strategies to maintain mobility for aging drivers, increasing self-sufficiency, self-esteem and quality of life.

"Funding from the Labarge Initiative is helping us understand age-related neural and cognitive changes so that we can develop strategies for maintaining safe driving, mobility and self-sufficiency for older adults."

Judith M. Shedden

#### PART 1: LABARGE OPTIMAL AGING INITIATIVE | PROJECT UPDATES



## Dancing for cognition and exercise pilot randomized controlled trial

DANcing for Cognition & Exercise (DANCE) at the GERAS Centre for Aging Research provides high-quality programming for older adults who have early cognitive and mobility limitations. The program is built on the foundation of research illustrating that exercising the mind and body together has benefits for physical and cognitive health. GERAS DANCE is offered in partnership with local YMCAs across Southern Ontario to help older adults remain active and socially connected in the community. Results of this pilot work indicated that over 90 per cent of participants rated the GERAS DANCE program as excellent and 100 per cent would recommend it to a friend or family member. Half of the participants connected with each other socially outside of class time, and GERAS DANCE significantly reduced fear of falling in older adults with early cognitive and mobility impairments.

### Investigators

Alexandra Papaioannou Courtney Kennedy George Ioannidis Richard Sztramko Dafna Merom Laurel Trainor Matthew Woolhouse Amanda Grenier Sharon Marr Christopher Patterson

"Funding from the Labarge Initiative enabled us to conduct important pilot work to examine the feasibility and clinical effectiveness of a dance program for older adults with early cognitive and mobility limitations."

**Alexandra Papaioannou** 

#### PART 1: LABARGE OPTIMAL AGING INITIATIVE | PROJECT UPDATES

From left to right: Jessica Gish, Brenda Vrkljan, and Lauren Griffith

## Improving confidence and behind-thewheel skills: Evaluating the feasibility of an older driver-health promotion intervention to optimize safe mobility

### Investigators

Brenda Vrkljan Jessica Gish Lauren Griffith Over the past year, the research team has completed a systematic review of evidence examining behind-the-wheel training interventions aimed at keeping older drivers safe behind the wheel for as long as possible. Findings from this review alongside focus groups with older drivers (n=23; age 79.6; 52% female) have informed the design of a leading-edge retraining approach that will be trialed with support from industry partner: Young Drivers of Canada®. The proposed training will involve video capturing the performance of older drivers and providing individualized feedback. This approach will be tested to determine its effectiveness with regard to improving behind-the-wheel abilities and acceptability of this approach. In the process of developing this program, the team is closely collaborating with the American Occupational Therapy Association (AOTA) Older Driver Initiative where they will be co-hosting a special joint symposium at the 2019 AOTA and Canadian Association of Occupational Therapy (CAOT) national conferences.

"By considering the best evidence and partnering directly with older drivers and other key stakeholders, we have co-designed a retraining program that aims to ensure our aging population maintains their behind-the-wheel skills. We are excited to test the effectiveness of this program right here at McMaster!"

Brenda Vrkljan



## Return on Investment: The Aging, Community and Health Research Unit's Community Partnership Program for Diabetes - Canada

The number of older adults in Canada with diabetes and other chronic conditions is on the rise. Supporting these patients and their family caregivers is a focus for researchers at the Aging, Community and Health Research Unit (ACHRU). What began as a pilot project in Guelph, Ontario, designed and developed with the public and researchers and funded by the Labarge Optimal Aging Initiative in 2013, has grown into this program of research that builds on the work of researchers at ACHRU. The aim of the research is to promote optimal aging at home for older adults with multiple chronic conditions by collaboratively designing and evaluating a new and innovative community-based health care intervention to improve access to health care, quality of life, and health outcomes. ACHRU's innovative Community Partnership Program is a community-based model for diabetes care that includes monthly wellness sessions and a series of home visits by a primary care Registered Nurse and a Registered Dietitian. They work as a team with staff and volunteers from community centres or YMCAs to deliver a health promotion program. The Community Partnership Program aims to improve diabetes self-management and the quality of care for older adults with diabetes and multiple chronic conditions. A randomized controlled trial, funded by the Ontario Ministry of Health and CIHR, was completed in 2017 in seven communities in Ontario and four in Alberta. With funding received in 2017 by CIHR, Diabetes Action Canada, McMaster Institute for Research on Aging, Scarborough Health Network and the Quebec government, the program is being further tested in three provinces over four years with future adaptations for implementation across Canada.

### Investigators

Jenny Ploeg Maureen Markle-Reid Ruta Valaitis



## Impact of Labarge Funding

Labarge funding has supported 82 trainees in 2018.

Before the Catalyst Grant, I did not have streams of research directly related to aging. Therefore, this grant was the key component in moving my program of study towards aging.

Kathryn Grandfield

The Labarge funding allowed me to expand into a new direction of research – preventing injury to older adults. It allowed me to hire my first PhD student, who has presented work at national and international conferences on her progress to date.

Cheryl E. Quenneville

Research funding has enabled the introduction and connection of researchers from across campus, and facilitated further research agendas. It has also solidified my research interests in transportation and aging.

**Bruce Newbold** 

Being a part of the MIRA trainee network has given me the opportunity to enhance my professional connections and build relationships with colleagues in other departments and Faculties.

Anna Garnett, PhD student

The Trainee Network is made up of students from many disciplines, which has proven to be a catalyst for fostering an interdisciplinary perspective in our own work. Being a part of an interdisciplinary group of trainees inherently fosters an interdisciplinary lens on the topic of our common interest: aging.

Stephanie Hatzifilalithis, PhD student

We are now planning a more ambitious research agenda with interdisciplinary members from MIRA in this area.

> Ayse Kuspinar and Chris Verschoor

**Building upon the GERAS DANCE** Labarge Initiative pilot study, our team has successfully received additional funds to (1) develop a train-the-trainer model to expand the GERAS DANCE program to **12 YMCA locations in Southern** Ontario, (2) create an instructional video series for trainers, and (3) further explore the relationship between dance, gait and falls.

**Courtney Kennedy and Alex Papaioannou** 

Labarge funding enabled research team members to broaden their networks of interdisciplinary research partners to support Canadian older adults to age in place.

**Rebecca Ganann** 

Labarge-funded researchers have created 56 new collaborations and partnerships in 2018 to advance their work.

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Funding from the Labarge Initiative has helped us to implement and test a new pathway to potentially reduce polypharmacy and its mobility-related effects to improve the lives of people living in long-term care.

**Dee Mangin** 

Planning for testing of older adults has completely changed our approach and our program of study has expanded significantly. This is our first project that looks at aging, and the Labarge Initiative is the reason we have moved in this direction.

Judith M. Shedden

Labarge-funded researchers have submitted or published 13 academic papers and participated in 46 conference presentations related to their work in aging in 2018.

## McMaster OPTIMAL AGING PORTAL

**The McMaster Optimal Aging Portal** continues to grow as a key resource to support older adults, caregivers and health professionals from around the world who are looking for a trusted source of credible, evidence-based information about the health and social aspects of aging.



PART 1: LABARGE OPTIMAL AGING INITIATIVE | THE MCMASTER OPTIMAL AGING PORTAL

## Social Systems Evidence and Portal content on social aspects of aging

Social Systems Evidence (SSE) was launched in fall 2017 with support from the Labarge Optimal Aging Initiative, the Faculty of Health Sciences, the McMaster Institute for Research on Aging and the Provost's Strategic Alignment Fund. SSE is an online repository designed to better support social system policymakers, stakeholders and researchers who want to access the best available research evidence in a timely manner. It currently includes close to 1,300 documents covering 16 topics, including consumer and social services, financial protection, government services, housing, public safety and justice, recreation, and transportation.



The McMaster Optimal Aging Portal content on social aspects of aging was launched soon after and continues to grow and be widely promoted. It currently includes the following content focused specifically on the social aspects of aging: 67 documents for social systems policymakers; 24 Blog Posts; 52 Evidence Summaries; 394 Web Resource Ratings. This broader range of content on the McMaster Optimal Aging Portal will better support citizens in making informed decisions as they age.

## Projects Funded by the Labarge Foundation

OPTIMAL AGING PORTA mcmasteroptimalaging.org

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## Pairing nursing and medical clerk students with experienced volunteers to visit older adults in their homes

Our aging population is beginning to impose mounting pressure on the health care system, yet health care providers are not all prepared to meet this growing need. One solution to fill this gap in a way that is intriguing to future health care providers is to look at non-traditional placements such as those integrating primary care, community work and work with older adults. The research team has piloted and evaluated the impact of a unique practical learning experience outside the traditional clinical setting. In this project, nursing and medical clerkship students were paired with experienced Health TAPESTRY community volunteers to visit older adults in their homes. There, they collected information about the older adults' health goals, risks, and needs to share with their primary health care team. Students then joined the care discussion at the primary care clinics, getting first-hand experience of interprofessional primary care team communication and care planning. A total of 20 students completed the placement. Students completed surveys before and after their time with the program on self-efficacy and attitudes toward older adults, and participated in focus groups after their placement. Findings showed that strengths of the program included gaining experience in visiting clients in their homes, the opportunity for hands-on experience with older adults, attending the interprofessional huddle and being involved in clinical action. Weaknesses included communication between the Health TAPESTRY program and students, and technology issues during training and home visits. Noted positive impacts included learning about an interprofessional approach to care, exposure to primary care as a placement setting, gaining new perspectives about older adults, particularly around mobility and resilience, and expanding abilities to help clients navigate and learn about community resources.

### Investigators

Ruta Valaitis Heather Waters Doug Oliver Larkin Lamarche Lisa Dolovich

"Enhancing the practical experiential training of nursing and medical students has helped to broaden student perspective on how to support healthy aging. It has also encouraged interprofessional team-based primary care in support of health and wellness in older adults."

**Lisa Dolovich** 

#### PART 2: PROJECTS FUNDED BY THE LABARGE FOUNDATION



## Investigators

Ruta Valaitis Carrie McAiney Maureen Markle-Reid Rebecca Ganann Jenny Ploeg

## Patient/caregiver engagement in communitybased research on older adults

The patient and caregiver partners in the Aging, Community and Health Research Unit (ACHRU) value opportunities to inform new service delivery approaches to meet the needs of older adults and the communities that support them. These partners provide valuable insights to shape research design and implementation. Patient and public engagement ensures that research has greater potential for real-world impact. The older adult patient and public research partners have provided advice about how to implement and adapt an intervention for transitioning from hospital to home that is aimed at supporting older adults with depressive symptoms and multimorbidity. Another outcome of the Labarge funding includes engaging older adult patients and public research partners in the development of training and orientation materials for new partners. The team continues to build capacity by providing a number of graduate students with an opportunity to gain hands-on experience with patient and public engagement as they help to support this work. The older adult research partners have identified personal benefits from partnering with researchers (e.g., enhanced self-management of health; awareness of resources). The insights gained through this work will be shared with the public and the broader research community who are invested in improving the lives of older adults.

"Thanks to the Labarge funds, we have been able to expand upon our research and add an evaluation component to measure engagement of patient and public research partners and its impact on the research."

**Project Team** 

#### PART 2: PROJECTS FUNDED BY THE LABARGE FOUNDATION

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## McMaster Toolkit for Working with Older Adults

The McMaster Toolkit for Working with Older Adults was developed by an interprofessional group of researchers and clinicians at McMaster University. The goal of the Toolkit is to build competence in older adult care by providing instruction and resources focused on increasing comfort levels and enhancing communication skills. The Toolkit is free to use, and consists of an online course, a trigger video to prompt group discussion and a website with additional resources. The Toolkit can be found at: machealth.ca/programs/mcmaster-toolkit/.

The team is working towards implementing a broader learning portfolio to provide an incentive for students to participate in experiential opportunities related to aging during their studies at the University. This platform, MacPAGE, was developed by Andrew Costa to stimulate and recognize student interest in geriatrics and has been piloted by the medical school at the Waterloo campus. The online course within the Toolkit will be a mandatory component of MacPAGE, and will be included as a resource in the expansion of this platform to other areas of campus.

# McMaster Institute for Research on Aging

The McMaster Institute for Research on Aging (MIRA) launched in fall 2016 with the mandate to serve as shared infrastructure to support aging research, education, collaboration and community outreach at McMaster University. The Labarge Centre for Mobility in Aging is MIRA's first focused centre.

In addition to the support that MIRA provides to the research and communications activities outlined in this report, the Institute also advances strategic initiatives related to educational and community engaged opportunities on campus and beyond. Examples of such activities include:

- the completion of a research study related to building an intergenerational space on campus, which has been presented at an international conference and submitted for publication;
- collaboration with stakeholders to develop and mobilize intergenerational programming at the University;
- development and execution of a tool and research study to assess the walkability of the McMaster campus for older adults and other stakeholders, in partnership with Facility Services;
- participation as a member of the Age-Friendly University (AFU) global network, including the

representation of McMaster at the annual meeting and participation in presentations at two international conferences;

- leading the development of the AFU action plan for McMaster, beginning with a survey of internal and external stakeholders to establish a baseline for the University's performance relative to AFU principles;
- participation in city-wide partnership activities, such as the development of the City of Hamilton's proposal for Canada's Smart City funding opportunity;
- development of a vision and leading stakeholder consultations related to the creation of a provincewide interdisciplinary research network on aging;
- establishment of new research partnerships with industry, health system or academic collaborators, such as the co-creation of a research program related to mobility within the Internal Medicine department at Juravinski Hospital.

## Key outcomes for MIRA include:

Growth in membership from 83 to 100+ researchers in aging across all Faculties

> 80 graduate students, postdoctoral fellows and undergraduate research fellows in MIRA's trainee network

More than \$400,000 in funding allocated to support to trainees in aging and mobility

> 8 strategic partnership agreements globally

## **Communications** Traditional and new media:

103 pieces of media coverage specifically mentioning MIRA or MIRA leadership: Readership equaled 17M, with an estimated 121K coverage views and 2.93K in social media shares

## Social media:

Established Twitter following: growth from 527 to 1,111 followers (111% growth) in one year

> Twitter all-time impressions: 650,509 (launched Sept 2016)

2.08K links back to McMaster University from this coverage

Communications

Three

communications

interns

team:

Top tweet earned **11.k** impressions:

#### Mar 2018 • 31 days

## TWEET HIGHLIGHTS

Don't miss MIRA's first #MIRAWebinar TOMORROW from 12-1 PM (ET): "How to Apply #DesignThinking to Research in #Aging", presented by @McMasterU PhD, PEng Robert Fleisig. It's going to be a good onel To join the webinar, follow this link: bitJy/2Gv4aLb plc.twitter.com/DXicAYEpUv

MIRA WEBINAR SERIES How to Apply Design Thinking to Research in Aging

Events and speaking engagements:

Newsletter:

> 600

newsletter

subscribers

15 speaking engagements with members of the public and government stakeholders

> **Co-hosted five public events**, leveraging partnerships with the Thrive Group, the Hamilton Philharmonic Orchestra, and the Ontario Neurotrauma Foundation

"My experience working with the McMaster Institute for Research on Aging as a Communications Assistant has been paramount in my professional and personal development. I have become comfortable with communicating the topic of aging, adept with diverse technical skills and prepared to navigate unique challenges. As a student, it is empowering to work with a team of professionals who are patient, encouraging and welcoming. I am very proud to be involved with MIRA."

> Mitchell Bonaccorso Communications Intern

PART 3: McMASTER INSTITUTE FOR RESEARCH ON AGING

## Labarge Centre for Mobility in Aging

The Labarge Centre for Mobility in Aging (LCMA) launched in 2016 with the mandate to amplify, facilitate and support research projects focused on mobility in aging. Mobility is critical to healthy aging, and can affect social and economic independence, along with physical and mental health. The Centre is positioned within MIRA, which allows it to gain efficiencies through shared staff, space and governance structures. Together, the LCMA and MIRA are well-positioned to respond to opportunities and enhance the lives of today's aging population.

## Major Research Initiatives

In 2017, MIRA and the LCMA launched a process to support interdisciplinary teams working towards the understanding, development and evaluation of critical issues in aging and mobility through two major research projects. The two broad fields identified as central themes were Exercise, Nutrition and Mobility in Aging and Technology, Environment and Mobility in Aging. The purpose of each of these working groups is to develop world-class research programs with a direct impact on the lives of older adults and their caregivers, while securing McMaster's reputation as a global leader in aging research. As this research is meant to involve and benefit end users, the principles of design thinking have been embedded in the process of developing and evaluating the proposals.

## Developing Interdisciplinary Programs of Research

In order to launch the research projects, a call for participation was distributed to all MIRA members and shared with other McMaster researchers with interests in aging. Over 80 researchers participated in initial meetings facilitated by design thinking experts, where participants stepped out of their 'silos' to place themselves within a context of opportunity, need and possibility. Researchers were asked: "What are the great challenges in this area of research?" "How could the skills and assets within MIRA be leveraged to address these challenges?" These early sessions set the stage for a series of MIRA-facilitated meetings, workshops, and stakeholder consultations, where researchers began to develop plans for a program of research in each stream. These proposals, summarized below, are in the process of being evaluated and iteratively developed based on feedback from external referees, MIRA leadership, and the MIRA/LCMA International Scientific Advisory Committee.



## The Proposals

## The EMBOLDEN trial: Enhancing physical and community MoBility in OLDEr adults with health inequities using commuNity co-design

Reduced physical activity (PA) and ability to carry out activities of daily living (ADL) commonly associated with aging, are recognized precursors to frailty, increased hospitalizations and premature death. Despite wellestablished benefits of multi-faceted PA and dietary behavioural change interventions for older adults (e.g., improved cognition; physical performance), optimal design features of such interventions are ill-defined. Co-design is a research approach that engages target populations and research stakeholders to ensure better alignment of research with existing community programs, leverageable assets, and applicable and appropriately contextualized experiences of older adults. The overall aim is to co-design an intervention that has mobility at its core. The team will implement and evaluate an innovative community intervention that targets physical and community mobility, nutrition, social participation and system navigation. This interdisciplinary team draws on expertise across several Faculties and academic units. The team has also engaged community-based older adults and providers as key research partners, ensuring a strong foundation for partnership, achievement of the proposed objectives and potential for real-world impact.





## Technological approaches for advancing the assessment of early mobility limitation in older Canadians

Problems with everyday mobility, such as walking or driving, are common in older adulthood and can negatively impact health and social functioning. This project brings together leading scholars in aging, mobility and technology research from several McMaster Faculties to investigate the manifestation of mobility problems at its earliest stages. The proposed research program aims to use advanced technological approaches to understand early changes in older peoples' mobility, and to identify those who will benefit from further healthcare follow-up and early preventative treatment. The team proposes to undertake a number of interrelated research projects to address these issues, including understanding the impact of early changes in mobility on an older person's level of functioning, applying machine learning techniques to data from the Canadian Longitudinal Study on Aging (CLSA) to find the most relevant predictors of early mobility problems, using technology to monitor and predict different aspects of mobility in the home and community, and developing a 'mobility signature' tool. This tool will be used to assess and depict a person's mobility status and risk for decline based on key mobility indicators. Ultimately, with this tool, the team hopes to help older people, healthcare professionals, and policymakers to prevent or delay late-life mobility problems through early detection and intervention.

## **Exploration Grants**

Exploration grants offer the opportunity to conduct collaborative and interdisciplinary research focused on mobility in aging. These grants are intended to stimulate new collaborations (planning grants) and allow researchers to collect preliminary data to support future proposals for full-scale studies (catalyst grants).

## Designing accessible art studios

#### Anticipated date: April or May 2019

Carmela Alfaro-Laganse (Faculty of Humanities) will partner with faculty members and staff from Social Sciences and Engineering to host a workshop at Hamilton's Centre[3] for Print and Media Arts. The purpose of

the workshop is to consider not only older adults' access to space, but the use of space, in the context of using formal artistic spaces for the creation of artistic output such as sculpture, pottery, woodworking, printmaking and other mediums. Discussions will involve the conditions for the use of space with a focus on aging, disability and mobility, and the challenges and benefits involved in participation in the arts.

## Alternate Level of Care (ALC) research for the aging population

#### Anticipated date: March 2019

When a patient occupies a bed in a hospital, but does not require the care and the resources provided in that care setting, the patient is designated ALC. The ALC wait period begins at the time of designation and ends at the time of discharge or transfer. Patients and healthcare systems alike are struggling with extended ALC times, which restrict patient mobility within the healthcare system. Pina Del Monte and Manaf Zargoush (DeGroote School of Business) plan to bring together approximately 50 researchers (from Business, Health Sciences, Science, Social Sciences and Engineering), and healthcare professionals to engage in conversation around reducing ALC wait times using an interdisciplinary approach that incorporates information systems approaches and stakeholder consultation.

## Pitch to your peers about the latest in aging research

#### Anticipated date: February or March 2019

This event will bring researchers together to pitch their innovative aging research initiative to our research community with the purpose of getting valuable feedback and developing collaboration.

Colleagues will be able to provide advice and insight into further developing research ideas in aging and potential collaborations. The event will also allow researchers to build relationships with potential mentors and peers. The first half of the event will have pre-determined researchers provide insight into their research for potential collaboration and feedback, and the second half the event will be open for others to bring ideas forward. After the event there will be time for informal networking.

## Mobility, aging and animalassisted interventions in long-term care

#### Anticipated date: January 2019

Research has demonstrated that older adults who own dogs are more physically active and are more likely to maintain their mobility into later life, and that walking a dog regularly contributes to a greater sense of community and social mobility. Similarly, studies of animal assisted therapy show that interaction with therapy animals improves the physical and emotional well-being of older adults. James Gillett (Faculty of Social Sciences) will lead an initiative to explore the viability of a study that seeks to understand the effect of animal assisted therapy on patient mobility in long term care. Researchers from the Faculties of Social Sciences, Science, Health Sciences, and Humanities will join stakeholder partners from the SPCA and the City of Hamilton, Macassa Lodge and Wentworth Lodge to discuss, plan and co-design a potential study.



## McMaster living mobility and aging lab

#### Completed April 2018

The Faculty of Social Sciences hosted a workshop to explore the viability and benefit of creating a living mobility and aging lab in partnership with the Royal Botanical Gardens (RBG), a community-based organization that offers Activity-Based Natural Built Environments (ABNBEs). The event included participants from all six Faculties as well as community partners, and resulted in a successful 2018 Catalyst Grant proposal, led by James Gillett, that will advance the ideas generated during this planning grant session.

## The boomer brain

#### Completed December 2017

The Faculties of Humanities and Business co-hosted a joint networking initiative exploring interdisciplinary connections between the neuroscience of aging and applied research in areas such as design thinking, neurophysiological tools, digital-aesthetic design, communications and marketing. The event consisted of a research workshop and public talk by Dr. Michael Smith, an applied cognitive neuroscientist and neuromarketing specialist. A discussion by MIRA members Terry Flynn (Humanities) and Milena Head (Business) followed. The event included tours of the new McMaster Digital Transformation Research Centre (MDTRC), followed by an opportunity for researchers to explore shared research goals and opportunities. Twentytwo researchers and seven research staff attended the workshop; one third of the researchers reported that the workshop inspired them to become more involved in aging research. MIRA gained several new members as a result

of this event, and existing MIRA members discovered new technology available to them at the MDTRC.

## Technology and design for optimal aging

### Completed November 2017

The Faculties of Engineering and Health Sciences collaborated to present a networking and knowledge sharing event for researchers, funders, industry partners and collaborators who aim to redesign the experience of aging. Over 80 registrants from across the University, the City of Hamilton, Hamilton Health Sciences, and various technology and healthcare industries came together to network and learn about McMaster's research initiatives, including the McMaster SmartHome, the ABLE arts based therapy platform, the My Stroke Team (MyST) app and more. Breakout sessions on topics including autonomous vehicles and driving technology; fitness wearables and trackers; medication management technologies, and others, encouraged networking and resulted in new connections among researchers and external partners.

University Club

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(31) PART 4: LABARGE CENTRE FOR MOBILITY IN AGING | PLANNING GRANTS



## A comprehensive framework for the conceptualization of physical mobility as an essential construct to address in both the assessment and treatment of older adults

### Investigators

Ayse Kuspinar Chris Verschoor Lori Letts Ruta Valaitis Ellen Amster Carol Bassim Dawn Bowdish Vanina Dal Bello-Haas Jonathan Dushoff Jocelyn Harris Carrie McAiney Sarah Neil-Sztramko Julie Richardson Brenda Vrkljan Mobility is one of the most important contributors to well-being and health-related quality of life as we age. Broadly defined as the ability of an individual to safely move within environments that expand from one's home and neighborhood to the greater community, it is critical to remaining socially engaged, reducing the risk of mental and physical deficits and preventing institutionalization. Furthermore, the wealth of literature spanning multiple disciplines indicates that pathways of mobility impairment in older adults are complex, influenced by factors belonging to biological, cognitive, behavioral, psychosocial and environmental systems. As such, preserving mobility into old age requires a personalized approach. This interdisciplinary team is using a mixed-methods approach to build and validate a model of physical mobility in older adults. To date, the team has explored sociodemographic, psychosocial and behavioural factors that are related to the ability of older adults to move around within their environment (life space assessment) using data from the Canadian Longitudinal Study on Aging (CLSA). In the next phase of this project, they will validate these findings by exploring the perceptions of older adults regarding mobility and impairment.



"Without funding from the Labarge Catalyst Grant program, we would have been unable to initiate these studies. This support has been a critical component of a foundation that we hope to use for future research and training opportunities in aging and mobility."

**Project Team** 

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From left to right: Manaf Zargoush, Maryam Ghasemaghaei and Reza Samavi

## Cognitive vs. chronological age as barriers to using wearable activity monitors in older persons

Daily physical activity is a strong independent predictor of morbidity, mortality and independence. The use of smart devices (e.g., Fitbit) has the potential to positively affect older adults' quality of life and decrease the use of expensive health resources. However, some members of this demographic group perceive high disability (i.e., cognitive and physical limitations) as a factor that makes it difficult to independently utilize smart devices. Subjective assessments of disability among older adults, viewed in the light of health decline, have received little attention both in literature and in practice. Moreover, individuals' self-perception of their own age (i.e., cognitive age) has been found to be a better predictor of their behaviors towards using technology than their chronological age (i.e., number of years from birth). Hence, this interdisciplinary project has involved scholars from Information Systems, Health Policy and Management, Kinesiology, and Computing and Software to explore the effects of older adults' cognitive age on their disability perceptions which can influence their adoption of smart devices.

### Investigators

Maryam Ghasemaghaei Manaf Zargoush Stuart Phillips Reza Samavi

"The findings of this study help system designers to understand some of the main design elements that are necessary while designing smart devices for older adults."

Maryam Ghasemaghaei



## Investigators

Jamal Deen Khaled Hassanein Tapas Mondal David Cowan

## Assessing and improving mobility in older adults using a smart knee monitoring system

Maintaining optimal mobility with relative ease and freedom of movement is key to healthy aging. The knee joint, being the primary bearer of the body weight, plays a vital role in mobility. Monitoring the knee joint can potentially provide important quantitative information related to mobility. With the support of Labarge funding, the team is developing a comfortable, wearable and easy-to-use sensing device to monitor knee-related problems in real time. The team's objective is to develop a smart wearable knee-joint device for mobility monitoring and early diagnosis of mobility-related problems among older adults by combining the analyzed data with input from clinical and business collaborators. The team has now conducted a detailed literature review on joint monitoring, and designed a sensing system by fusing different types of sensors (such as pressure and temperature). The resulting wearable wireless knee monitoring system is simple, easy-to-use, cost-effective, non-invasive and unobtrusive. The team will now collect data using the monitoring system and work with clinicians to interpret the data in a way that will provide useful information about the overall mobility status of the individual.



"The Labarge funding has contributed towards our goal of developing the smart wearable knee sensing system to be used for monitoring, assessing and improving mobility in older adults."

**Project Team** 

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n Aging

From left to right: Henry Schwarcz, and Ivan Strakhov

## The ultrastructure of osteoporotic bone and its medical implications in aging populations

Osteoporosis is a chronic condition that affects older adults. It is characterized by significant loss in bone mineral density, and often associated with increased fracture frequency which is a contributing factor to decreased mobility in older adults. However, the origin of this decreased bone density at the nanometer level of bone remains unknown. This project combines engineers, basic scientists, clinicians, geriatricians and orthopaedic surgeons to explore the origin of changes in osteoporotic bone at the nanoscale using advanced high-resolution microscopy, and to determine how a better understanding of osteoporotic bone structure at the nanoscale impacts current therapeutics, implant design and fracture prevention.

### Investigators

Kathryn Grandfield Henry Schwarcz Jonathan Adachi Justin De Beer Janet Pritchard Alex Papaioannou

"Funding from the Labarge Catalyst Grant has allowed us to probe osteoporotic bone structure at unprecedented scales with advanced microscopes. We are on track for identifying a new biomarker for osteoporosis detectable only at the nanoscale. This will shed new light on the disease and possibilities for treatment."

Kathryn Grandfield



### Investigators

Paula Gardner Patricia Hewston Alexandra Papaioannou Courtney Kennedy Laurel Trainor Rong Zheng

## ABLE: Arts-based therapies enabling longevity for geriatric outpatients

As population of older adults in Canada increases, frailty becomes an urgent issue. Frailty can result in physical deconditioning and expedite pathways to reduced physical and mood health and social participation. Art, music and game play, however, are powerful therapeutic activities that can motivate participation in physical activity and may have synergistic effects, enhancing cognitive, physical and emotional health. This interdisciplinary team, consisting of scholars in aging, health, engineering and media technologies, has created the project ABLE to tackle this problem. The ABLE project offers arts- and games- based movement experiences using its unique unobtrusive wearable technology to encourage older adults to engage in therapeutic exercises. Participants' movements produce unique feedback by creating digital paintings or adding a percussion track to a favorite song; this could be enhanced in the next iteration, which will involve multi-player and cross-generational gaming. The team anticipates that the pleasure older adults experience while engaging in these artsbased therapies will encourage consistent, long-term commitment to the program. The research team will capture data throughout the research process to determine how the ABLE platform impacts cognitive, physical, and emotional parameters.

"Funding from the Labarge Centre is helping older adults with frailty and dementia to engage in physical therapy and movement that feels like a game, increasing their activity levels and improving their mobility and mood."

Paula Gardner





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## Implications of driving cessation amongst Canada's older adults living in rural and small urban communities

While policy makers have long recognized the impact of an aging population on Canada's health care and national pension plans, the automobility of older adults has received less attention. Driving cessation, often due to poor or declining health or eyesight, is particularly troublesome due to known linkages with social isolation. For policy makers to respond effectively to transportation-related impacts of an aging population, they must understand changing travel behaviours as cessation is approached and completed. Older adults residing in rural and small urban areas where transportation alternatives are more limited and reliance on the car is greater were the focus of this research, shifting the emphasis away from larger urban areas. This interdisciplinary team, consisting of scholars in geography, aging, rehabilitation science and business, is exploring the driving behaviors of older Canadians in small towns and rural areas to gain a better understanding of their driving options and the impact of driving cessation on their ability to participate in their community.

### Investigators

Bruce Newbold Darren Scott Jim Dunn Amanda Grenier Kai Huang Brenda Vrkljan

"Funding from the Labarge Centre has led to new insights into the challenges faced by older adults living in rural areas and small towns when it comes to their travel options and behaviours."

**Bruce Newbold** 



## Meanings of (im)mobilities: A 'new mobilities' perspective

### Investigators

Amanda Grenier Meridith Griffin Gavin Andrews Jim Dunn Alexandra Papaioannou Rob Wilton Equity Burke Traditional assumptions about mobility in later life remain fixed around ideas of function and physical movement. The 'New Mobilities' perspective, however, challenges such understandings, drawing attention to the complex power relations and privileges of mobility that operate across a range of relationships, settings, sites and contexts. This pilot study provides insight on mobility while aging through 15 exploratory interviews with older people at three social locations, including five individuals considered frail, five who are aging with a disability and five who self-identify as active. In doing so, the study explores the extent to which social, political and environmental factors have the ability to enhance the mobility of some and the immobility of others through opportunities, access, transportation, technology and networks. Ultimately, this project attempts to better understand mobility while aging to optimize the well-being of older adults.

" The Labarge funds have allowed us to connect with groups of older people whose voices are often silenced in the conversations on aging and mobility in order to enhance understandings of mobility beyond movement and physical function."

**Amanda Grenier and Equity Burke** 



## Born and raised in Hamilton: Intergenerational and life course program of research

Age related changes in health and mobility are inevitable; however, the age at which changes occur (onset), individual trajectories, and how health outcomes are interrelated, vary. Recently, attention has shifted from adult lifestyle and risk factors as causes for disease to a life-course perspective, examining risk factors that occurred much earlier in life. Here, we propose a comprehensive life-course approach which investigates the long-term effects of physical and social exposures at various stages of life (from childhood to adulthood) on health and disease risk in later life. The purpose of this catalyst grant is to develop a program of research within MIRA to study intergenerational and life course aging. The proposed Catalyst grant will take on three main activities: 1) using data from the Canadian Longitudinal Study of Aging (CLSA), we will examine the effect of early life adversity on mobility, function and frailty. Furthermore, we plan to also explore the relationship between early child adversity and mental health, and how this is mediated by social isolation; 2) to perform a systematic review of existing literature to determine if early life and intergenerational influences impact mobility and functional abilities, mental health and social isolation in later life; and 3) based on findings from the first two objectives, we will develop a proposal to establish a population based intergenerational cohort study. We will also conduct a pilot study to assess the feasibility of such a cohort in Hamilton area.

### Investigators

Andrea Gonzalez Parminder Raina Other partners to be confirmed

"It is the first time in history that we have up to four generations living at the same time. The Labarge funding provides an opportunity to investigate the multifactorial impact across generations to understand how these factors impact the processes of healthy aging."

Andrea Gonzalez and Parminder Raina

## AGING REIMAGINED

Vickie Galea

> Managing pain in older adults: A virtual learning environment for understanding the physiology of acute pain and its impact on mobility in older adults

## Investigators

David Harris Smith Vickie Galea Norm Buckley Milena Head Ada Tang Matthew Woolhouse Chronic pain in older adults has a significant impact on mobility and activity levels and can exacerbate other health conditions including depression, frailty and cognitive impairment. Poor management of pain may initiate a cycle of health deterioration leading to a reduction in physical resilience and fitness and, consequently, increasing musculoskeletal pain. Our healthcare programs, on which we depend for the training of healthcare professionals, have been identified as having inadequate training in the physiology of the sensory nervous system's response to pain and the perception of pain. This interdisciplinary group of researchers from the Faculties of Humanities, Health Sciences and Business, in cooperation with the Michael G. DeGroote Pain Clinic, will design, develop and evaluate an experiential learning resource for understanding and managing acute pain in the context of older adults. This will be created using an interactive learning environment within a 3D avatar world. Consultation will take place with end users of the module, graduating MD, OT and PT students, who will be caring for older adults

in their clinical practice. Because the learning resource also incorporates the management of pain, assistance from older adults will be sought in choosing outcomes related to the improvement of their care and will be very important to the knowledge mobilization plan.

"We are grateful for this funding from the Labarge Centre which will provide students in healthcare programs an invaluable opportunity to learn from an interactive resource designed from the perspectives and experiences of older adults with present or past acute pain."

**David Harris Smith** 

## AGING REIMAGINED

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From left to right: Reza Samavi and Manaf Zargoush

## Addressing the alternate level of care issue facing older Canadians: A co-designed comprehensive data analytics approach

Alternate Level of Care (ALC) is a designation assigned to patients (primarily older adults) in acute care when it has been determined by their medical team that they no longer require the intensity of services provided within their current location and await either an appropriate safe return to their home environment or placement in a community care setting, such as home care or residential care. This transition is not always easy nor is it immediately possible. Unfortunately, ALC-designated older adults often observe a rapid decline in their health and well-being as a result of the situation. This is not a simple problem but rather a complex issue involving various healthcare stakeholders including hospital networks, Local Health Integrated Networks (LHINs), service providers engaged in the process of either patient rehabilitation or transfer, as well as patients and their families. As the demographic trends continue, an increasing number of older patients will find themselves in this inconvenient, health-threatening and stressful situation. It is, therefore, clear why ALC is a leading healthcare challenge with implications resonating throughout the healthcare network. This study aims to improve the decision-making process for alleviating the ALC issue by employing relevant data and implementing advanced data analytics. As a result of improved decision making informed by these analytics, ALC patients will benefit from smoother transitions to appropriate care.

### Investigators

Manaf Zargoush Alexandra Papaioannou Reza Samavi

"The funding from the Labarge Centre to support this project will provide decision makers with enhanced insights regarding older patient mobility through the healthcare system. Through these insights, it is anticipated that ALC waiting time can be better managed and appropriate resources can be assessed to ensure that older patients are receiving the right care at the right place and time."

**Manaf Zargoush** 

From left to right: Brenda Vrkljan, Bruce Newbold, Saiedeh Razavi, Hany Hassan, and Kassandra Byrne

## Maintaining the mobility of older Canadians: Examining the transition from driving to driving cessation

### Investigators

Saiedeh Razavi Bruce Newbold Brenda Vrkljan Hany Hassan Mark Ferguson Safe mobility is critical for people aged 65+ to help maintain quality of life, happiness and well-being. Being able to move beyond one's home as an older adult requires consideration of transportation needs and preferences. This research aims to address a significant gap in evidence with respect to aging and mobility by examining older adults' perceptions, preferences and needs in relation to driving and to accessing other modes of transport that could become more important as people age and as technologies evolve. Examples include: public and/or accessible transit, ride-sharing services, self-driving and connected vehicles. Underlying this objective is a need to further understand factors that influence the decision to cease driving and shift altogether to other transportation modes. To this end, a comprehensive survey instrument is being designed and implemented for a sample of older adults in Hamilton, Ontario. Results are expected to have a real impact on how local transportation systems are designed for the older users of today and tomorrow. Moreover, the research outputs from this work will provide a template that other municipalities in Ontario, across Canada and elsewhere can employ to help understand the mobility needs of older adults.

"Funding from the Labarge Centre will help to provide considerable insight on the transition to driving cessation as people age and how other travel modes and technologies can compensate to preserve personal mobility of older Canadians outside the home."

Saiedeh Razavi



## Supplementation with n-3 polyunsaturated fatty acid-enriched fish oil to mitigate skeletal muscle-disuse atrophy in older women

After the age of 50 years, we begin to lose muscle. This muscle loss has a variety of negative impacts on our health and ability to perform activities of daily living (e.g., climb stairs). Aging also reduces our muscle's capacity to absorb sugar from the blood via insulin, resulting in high blood sugar levels, and the start of diabetic complications. Likewise, we know that periods of muscle-disuse, such as those experienced during hospitalization and immobilization, result in muscle loss and impaired blood sugar control. So, when an older person experiences periods of muscle-disuse, there is an additive effect on muscle loss and blood sugar control. Muscle-disuse and aging have an enormous impact on health care costs in Canada. However, there is evidence that consuming fish oil changes the type of fat in human muscle and might protect against disuse-induced muscle loss as well as the onset of diabetes. The aim of this team's investigation is to examine if supplementing the diet of older people with fish oil before being immobilized is protective towards muscle loss and blood sugar control. The team will also examine if fish oil supplementation improves muscle mass and blood sugar control during recovery from immobilization. The team hopes that the findings from this study will help combat muscle loss and the onset of diabetic complications to improve the health of older adults.

### Investigators

Stuart Phillips Thomas Hawke Michael Noseworthy Tanya Holloway Chris McGlory

"Funding from the Labarge Centre will assist with the development of nutritional strategies to promote musculoskeletal and metabolic health during periods of muscle-disuse, such as those experienced during illness and/or surgery."

**Stuart Phillips** 

From left to right: Daniel Cursio, James Gillett, Manaf Zargoush, Maryam Ghasemaghaei, and Nancy Bouchier

NFD

## Aging and mobility in nature: A McMaster and Royal Botanical Gardens collaboration

### Investigators

James Gillett Meridith Griffin Gavin Andrews Marla Beauchamp Rong Zheng Nancy Bouchier Maryam Ghasemaghaei Manaf Zargoush Jennifer Heisz With a growing aging population, there is an imperative to document, understand and analyze the engagement with natural built environments by older adults. This knowledge will facilitate the improved mobility of older adults in environments designed to be meaningful, enjoyable and to enhance well-being. Anchored in the Social Sciences, and in collaboration with the Royal Botanical Gardens (RBG), this research understands the mobility practices and meanings of older adults in natural built environments. The project takes three forms: (1) a 'mobility in nature' survey of older adults who make regular use of the gardens; (2) an observational study of guided interpretative walks at the gardens by older adults; (3) a series of ethnographic studies of nature-based active leisure programming with a specific focus on mobility and aging in these contexts. This research serves as the foundation for an interdisciplinary series of projects in collaboration with RBG in the area of mobility and aging. Through engagement in these studies, the team will explore viability and utility of extending to older adults the Back to Nature Outdoor Charter for youth about the value and necessity of nature for well-being that is integral to work at the Royal Botanical Gardens.

"Funding from the Labarge Centre will help improve our understanding of the benefits of outdoor green space programming for older adults. It will also articulate ways of improving the accessibility and 'age-friendliness' of green spaces that promote mobility."

**James Gillett** 

## **Building Capacity**

The Labarge Centre for Mobility in Aging (LCMA) has invested in the development of the next generation of researchers in aging. Activities include awarding graduate scholarships, creating an active and engaged Trainee Network and forming a Training and Capacity Working Group that will explore ways to build capacity among students in the field.

## Trainee Network

The MIRA/LCMA Trainee Network supports graduate students and postdoctoral fellows with interests in research on aging. The Network has 80 members from across all six McMaster Faculties, and is guided by a five-member executive committee. The Network holds monthly meetings where members share their research, challenges and experiences. In addition, the Network organized multiple special events for trainees in 2018, including a trainee research fair (held in conjunction with the Smart Cities for Aging Panel), a speed mentoring session with global leaders in aging research and a writing retreat where the objective was to develop a manuscript reflecting on perceived benefits of participating in the interdisciplinary trainee network. In the summer of 2018, the trainee network welcomed the participation of eight MIRA-funded undergraduate summer research fellows. The undergraduates gained access and exposure to potential role models in graduate and post-graduate research, and were given the opportunity to reflect and present on their summer research experiences at their final meeting.

"The Trainee Network has provided me with the opportunity to network with other aging researchers and gather feedback on study and data analysis protocols, and to practice skills in knowledge translation. I'm looking forward to maintaining these connections moving forward as I finish my Ph.D."

> Sara Oikawa PhD Candidate

"This experience influenced my research goals, as I now wish to pursue a post-graduate degree studying the aging population and continue this work in my career. The Fellowship allowed me to continue to enhance the skills I had previously obtained through my thesis and create connections with other professionals and students in the field."

> Giulia Coletta MIRA Undergraduate Fellow

"When you consider that all the members of the Network are from McMaster, the proximity of this wide-range of research opens up a door to communicate and collaborate on research techniques. The Executive Committee has become an outlet to develop my own leadership skills and to cater meetings and events to reflect the needs of this group of researchers as well as give visibility to our members through the website."

> Sydney Valentino MSc Candidate

## Educational Programming

MIRA and the LCMA are leading an initiative focused on supporting educational programming on aging for students and members of the community. In 2018, MIRA partnered with the McMaster Centre for Continuing Education (CCE) to develop a course for caregivers that is currently being piloted in three Ontario communities. This project was funded through a Seniors Community Grant from the Province of Ontario.

MIRA is also continuing to support increased opportunities for student engagement with older adults and research on aging. Dr. Andrew Costa and his team in the Faculty of Health Sciences at the Michael G. DeGroote School of Medicine Waterloo Regional Campus, together with project partners at Schlegel Villages, the Research Institute for Aging and MIRA have continued their work on MacPAGE: McMaster Passport for Geriatric Education. The MacPAGE program is designed to encourage learners to engage in experiential education opportunities related to working with older adults, and enhance their skills and geriatrics-related competencies.

The MacPAGE program was launched this year and is currently being trialed at the Waterloo Region Campus by undergraduate medical students. MIRA is working with the MacPAGE team to refine and release MacPAGE 2.0, which will have updated content and functionality, and will be accessible by a wider user base. MIRA is currently liaising with the Student Success Centre about plans to expand and trial the platform with undergraduate students from broader disciplines.

Finally, MIRA's Training and Capacity Working group is continuing to discuss new ways to encourage student interest in research on aging and to ensure that students at McMaster are able to access available learning opportunities about aging.



## Labarge Post-Doctoral Fellowship in Mobility

In 2018, MIRA and the Labarge Centre held a competition to identify the inaugural Labarge Post-Doctoral Fellow in Mobility, Dr. Patricia Hewston. Supervised by Alexandra Papaioannou and mentored by Amanda Grenier and Steven Bray, the vision for the project is to build infrastructure and capacity to initiate a program in aging and mobility with GAITRite technology. It is also, ultimately, to inform best practices for fall prevention and to optimize the mobility and well-being of older adults with mild cognitive impairment (MCI). MCI can be a transitional state between cognitively intact and dementia, and is associated with double the risk of falls compared to those without MCI. Falls can result in declines in mobility, activity avoidance, institutionalization and mortality. Given the importance of preventing falls in older adults with MCI, simple yet highly predictive technologies are advantageous to provide precise and standardized feedback to assess and track change in fall risk before and after intervention, and to inform best practices for fall prevention.



## 2017 Labarge Mobility Scholars



## Sydney Valentino: Stair climbing outcomes in cardiac rehabilitation exercise (SCORE) trial

One in every 12 Canadians is living with heart disease; by the age of 65, it is the leading cause of death. After a cardiac event, exercise improves recovery, reduces the chance of reoccurrence and the benefits are maintained as exercise is adhered to. The purpose of this study is to assess the changes in cardiac structure and function in individuals with coronary artery disease undergoing traditional endurance-based exercise (TRAD) in comparison to stair-climbing-based high intensity interval training (HIIT). Eligible participants are recruited from the Cardiac Health and Rehabilitation Centre at the Hamilton General Hospital to complete three cardiac testing sessions at the beginning, middle and end of the cardiac rehabilitation exercise program. As of September 2018, seven participants have successfully completed three months of cardiac rehabilitation as part of either the HIIT or TRAD groups and an additional three participants are enrolled in the exercise program. The team believes that stair-climbing based HIIT has the potential to elicit similar physiological benefits as traditional cardiac rehabilitation, albeit with increased time efficiency and minimal equipment requirements. Recruitment, testing and analysis is currently ongoing to understand the full benefits of this exercise modality on the cardiovascular system. Thus far, the SCORE trial has demonstrated stair climbing-based HIIT exercise is feasible within standard cardiac rehabilitation programming.

> "It is due to the Labarge Centre for Mobility in Aging funding that I have become part of impactful collaborative research that has personal and communitywide relevance."

> > **Sydney Valentino**



## Kalu: Mobility enhancement comprehensive care model

During the first year of study, two scoping reviews have been completed, which have been presented at two conferences and submitted for publication in peerreviewed journals. The first scoping review was focused on understanding the role of physiotherapists (PTs) and occupational therapists (OTs) in care transitions. Of the 21 included studies, only three mentioned the role of OTs or PTs in care transitions; however, the roles were not explicitly described and there was no evidence of overt involvement of rehabilitation professionals in the care transition processes. The second scoping review was aimed at examining the association between socioeconomic status (SES) and mobility in older adults. In this review, 53 analyses (77%) reported a statistically significant association of SES (income, education, and occupation) and the mobility of older adults. This implies that older adults with higher education, higher income and who have held or hold skilled jobs have improved physical mobility.

> "Funding from the Labarge Centre for Mobility in Aging has helped me establish a global network of mentors who are helping me develop and refine my leadership, research and knowledge translation skills – critical skills that will enhance my ability to have an impact on aging research in the future."

> > **Michael Kalu**

## 2018 Labarge Mobility Scholars



Stephanie Chauvin: Technology for promoting exercise adherence and mobility in older adults

PMobility limitations are a substantial challenge that many older adults with chronic health conditions face, which may lead to adverse outcomes such as disability, hospitalization and death. The overarching goal of this project is to examine how technology can promote exercise adherence and mobility in older adults. The first study will explore the participant experiences of a home-based fall-prevention exercise program using DVD technology for older adults with chronic obstructive pulmonary disease. The second study aims to determine the effect of computer and mobile technology interventions versus faceto-face and/or hard copy/digital documentary-delivered interventions on exercise adherence and physical function in older adults. A systematic review and meta-analysis will be conducted to compare interventions. The results of these studies will allow for a better understanding of the role technology plays and how to best utilize technology to increase exercise adherence and mobility in older adults.



Stokes: Whole milk to augment muscle protein synthesis in older women: a randomized, controlled trial

Tanner

Older adults experience progressive loss of muscle mass and strength accompanying the aging process, termed sarcopenia, which predisposes those affected to an increased risk of falls, fractures, diabetes, and an impaired ability to perform activities of daily living. Sarcopenia is inevitable, but research suggests that we can attenuate these losses by increasing dietary protein intake above current recommendations and encouraging physical activity. The primary aim of this study is to assess the efficacy of proteins contained in whole and skimmed milk compared to a common dairy alternative (i.e., almond beverage) on indices of mobility in older women. We chose to look specifically at women because they live, on average, longer than men and a majority are not currently meeting basic protein requirements. Results from this study will help equip healthcare practitioners with a practical, easily-implementable strategy with the potential to reduce the impact of sarcopenia in the aging population.

"Funding from the Labarge Mobility Scholarship has opened a door for me where I can work alongside McMaster's aging experts to make a difference in the lives of older adults."

**Stephanie Chauvin** 

"Funding from the Labarge Centre for Mobility in Aging will allow me to promote this work and secure potential collaborations that will facilitate my progression as an independent young scholar and scientist in this field."

Tanner Stokes

## Age-Friendly University Initiative

In 2017, McMaster University joined the international Age-Friendly University (AFU) network, a global body made up of higher education institutions that are committed to being more accessible to older adults. The AFU network was launched in 2012 by Dublin City University (DCU) in Ireland as a way to assist in addressing the challenges and opportunities associated with the world's aging population. It builds on the World Health Organization's Age-Friendly Communities Initiative, which encourages all communities to shape their physical and social environments to support people of all ages.

MIRA has led a number of activities related to McMaster's membership in the Network in 2018, including a walkability study of the McMaster campus for older adults, a survey of McMaster's performance relative to the AFU guiding principles, focus groups with older adults regarding their perceptions of McMaster as an AFU, and presentations at the AFU Annual Meeting/Conference and at the International Federation of Aging conference; the latter presentation was developed and delivered in partnership with DCU and the University of Manitoba.

Preliminary results reveal that older adults in Hamilton and the surrounding communities are interested in learning more about McMaster and in taking part in the various services, activities, events, courses, and research opportunities available to them. Working towards making McMaster barrier free, ensuring that McMaster's campus feels like a pleasant and welcoming place to visit, and improving awareness of events happening on campus will help create a space where people of all ages and abilities feel welcomed and empowered.

Once this research has been completed, MIRA will identify areas of interest and development that are important to participants, aligned with MIRA's mission and actionable. MIRA will assemble a steering committee to act on these recommendations in support of our efforts to meet the principles of an AFU, and will continue to seek opportunities to engage with older adults in the community, such as through the intergenerational programming currently under development.

From left to right: **Nick Kates**, Principal Investigator for McMaster, **Suzanne Labarge**, and **Tarek Rajji**, Principal Investigator at CAMH

## CAMH-McMaster collaborative care initiative for mental health risk factors in dementia

### Investigators

Tarek Rajji Nick Kates Karen Saperson Carrie McAiney Pallavi Dham Many older Canadians experience episodes of depression and anxiety as well as showing signs of early cognitive impairment, all of which can affect their well-being and functioning. These problems frequently go unrecognized, although most older adults will have fairly regular contact with their family physician. This project aims to increase the skills of primary care providers in recognizing and treating depression, anxiety and mild cognitive impairment in older adults by introducing a treatment pathway into their practices and reorganizing the way care is delivered to older adults to increase the likelihood that problems will be recognized. Working with four very different primary care practices, the project is integrating an evidence-informed treatment pathway for all older adults born in two specific years, using a control group born in a different year. Initial data from the program has identified that the algorithm can assist in identifying individuals with depression, anxiety and mild cognitive impairment, and linking them with services they would not have otherwise received. The team is now looking at the medium-term benefits (one to two years) of these interventions in the treatment groups when compared to the control group.

"In recognition of the need for greater access to mental health groups, a Brain Health Group was developed for participants in the study, providing information on mindfulness, stress reduction, medication management and the role that exercise and diet play in mental health. This group is now part of the team's Healthy Aging Series and is available to patients in the rest of the clinic."

**Carrie McAiney** 

#### PART 6: OTHER INITIATIVES SUPPORTED BY LABARGE FUNDS

## Raymond and Margaret Labarge Chair in Research and Knowledge Application for Optimal Aging

In 2006, thanks to a generous donation from Suzanne Labarge, the Raymond and Margaret Labarge Chair in Research and Knowledge Application for Optimal Aging was established. The goal of the Chair is to contribute significantly to the body of scholarship on research and knowledge application for optimal aging. Its inaugural recipient, Dr. Parminder Raina, has held the position for the last 12 years.

Dr. Raina is the Scientific Director of the McMaster Institute for Research on Aging (MIRA) and the Labarge Centre for Mobility in Aging. He also leads the groundbreaking Canadian Longitudinal Study on Aging (CLSA), which is one of the largest and most comprehensive cohorts on aging in the world, with data from 50,000 Canadians being collected for the next 20 years. As of June 2018, more than 130 research teams have applied to use data from the CLSA and more than 70 MIRA researchers are using CLSA data to generate high quality evidence. In 2018, the CLSA completed its first follow-up and launched the second follow-up phase of the study. The longitudinal data from the first follow-up will be available to the research community in early 2019.

In 2017 and 2018, Dr. Raina's important scientific contributions in areas such as multimorbidity, frailty, sarcopenia and cognitive norms among older individuals were published in high impact peer-reviewed journals such as the Journal of Gerontology, Journal of Clinical Epidemiology, Journal of Community Health and Epidemiology, Age & Ageing and Clinical Neuropsychology, among others. In 2018, Dr. Raina was also selected to be a member of the National Seniors Council, a body that acts as advisory to the Federal Ministers of Seniors and Health.

> Parminder Raina

### Labarge Centre for Mobility in Aging and Labarge Optimal Aging Initiative

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LABARGE Initiative Definition

Labarge Centre for Mobility in Aging

Institute for Research on Aging

## BRIGHTER WORLD