



Gerass

Centre for Aging Research

2023

[jeh'ruhzh] *noun* - Greek for old age



We are grateful for the generous donation to our Research Centre from Margaret and Charles Juravinski.

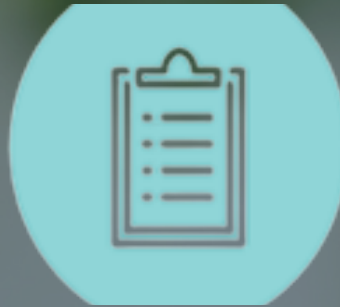
A special thank you to the support of Hamilton Health Sciences Foundation, McMaster University, Department of Medicine, the St. Peter's & McMaster Chair in Aging and MIRA for their partnership and collaboration.

11



Scientific Advisors

23



Affiliate Researchers

74



Research Grants

54



Research Trainees

112



Journal Articles

190



Presentations

35+



2016-2021 Partner Organizations

68



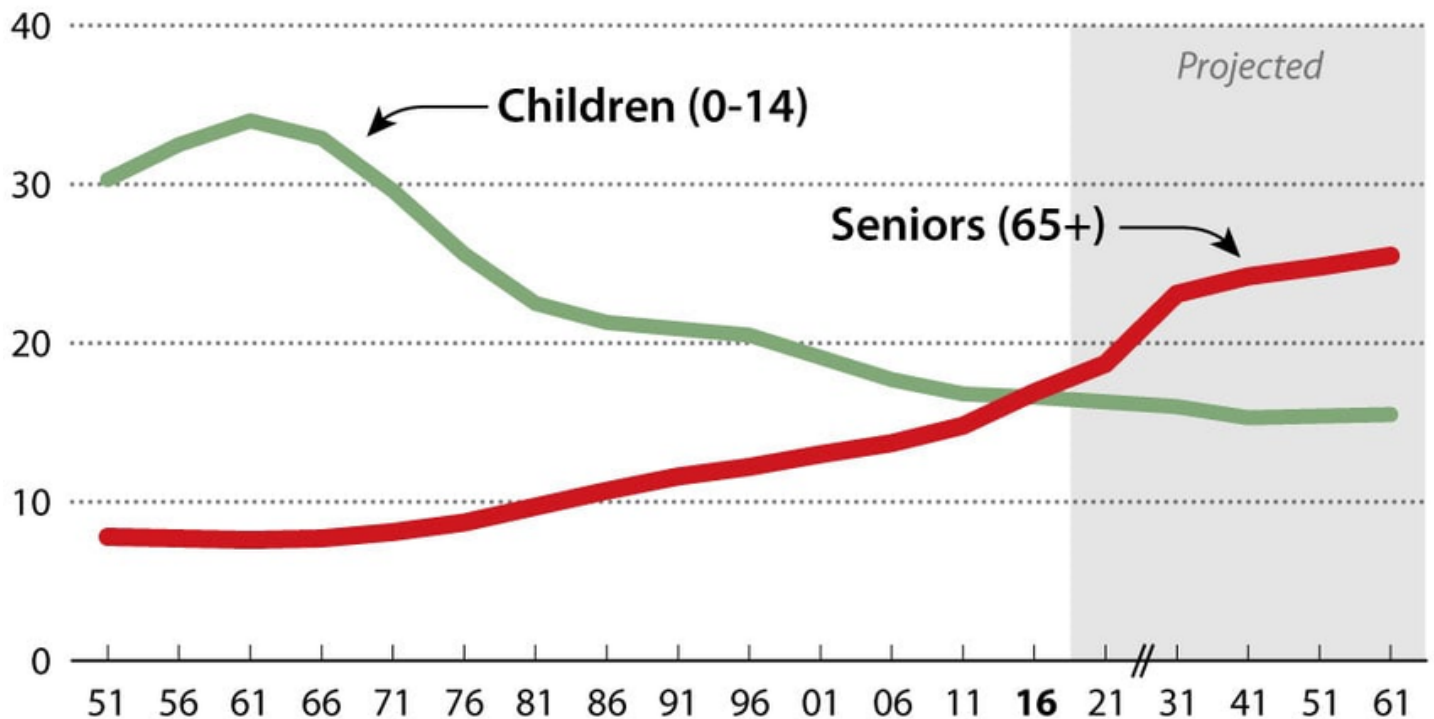
Media Releases

SENIORS ARE THE FASTEST GROWING AGE DEMOGRAPHIC WORLDWIDE

MORE SENIORS THAN CHILDREN

In 2016, for the first time, the share of seniors (16.9%) exceeded the share of children (16.6%).

PERCENTAGE OF THE TOTAL POPULATION



SOURCE: STATISTICS CANADA

YEARS

THE CANADIAN PRESS

OUR STRATEGIC PLAN

MISSION

To make life better for older adults with high impact research tackling the biggest challenges facing our aging population.

VISION

Promoting healthy aging to help people age with dignity and independence.

STRATEGIC DIRECTIONS

(1) Advancing research innovations, new models of geriatric care, and clinical interventions, (2) Collaboration among healthcare professionals, researchers, older adults, and caregivers and (3) Training the next generation of leaders in aging research.



BRAIN HEALTH



BONE HEALTH



RESEARCH FOCI

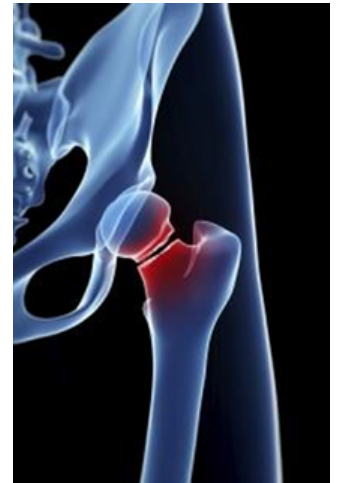
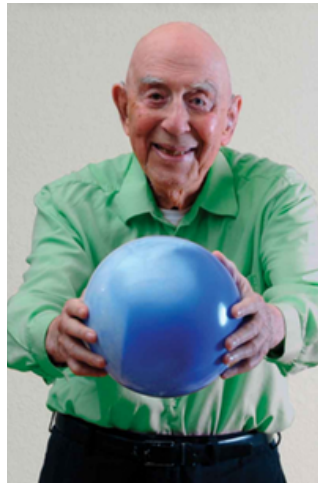


RESILIENCE & FRAILITY



INNOVATION & TECHNOLOGY

RESEARCH & HEALTH INNOVATION



RESILIENCE & FRAILITY; BONE HEALTH

NEW MODELS OF GERIATRIC CARE: \$2.2 MILLION IN CIHR RCT FUNDING

The GERAS Centre has been awarded 3 Canadian Institutes of Health Research (CIHR) Project Grants advancing geriatric medicine at McMaster University.

We are leading the first Canadian trial in frailty rehabilitation (ClinicalTrials.gov - NCT03824106). This randomized control trial (RCT) is for community-dwelling older adults (aged 70+) with frailty and at high risk for mobility disability. To address the immediate impact of COVID-19 restrictions, our team quickly mobilized in-person rehabilitation services (medication support, exercise, nutrition, socialization) to be delivered remotely at home to build resilience in seniors (ClinicalTrials.gov - NCT04500366).

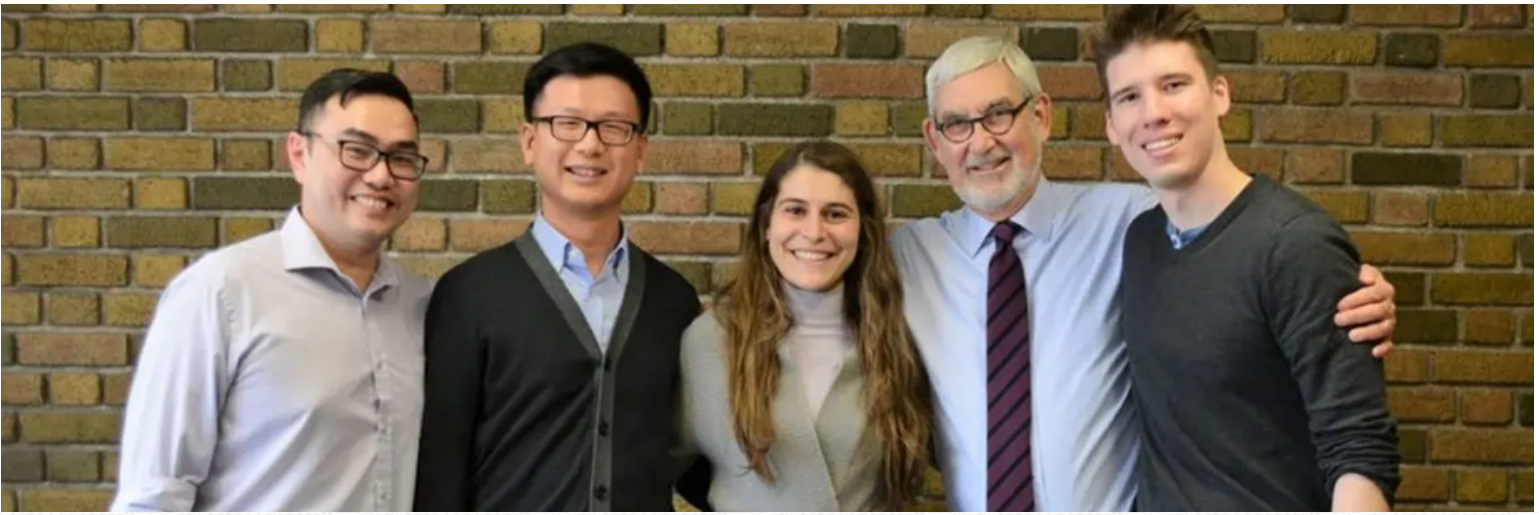
We are revolutionizing rehabilitation before surgery to improve post-surgical outcomes with the first Canadian RCT to evaluate the clinical effectiveness of a multimodal frailty

reduction intervention before surgery to improve post-surgical outcomes following joint replacement surgery (ClinicalTrials.gov - NCT02885337).

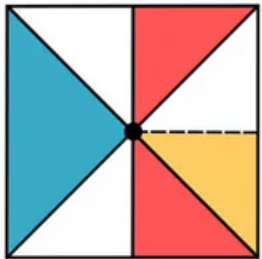
We are leading the first pan-Canadian, pragmatic cluster RCT for fracture prevention in long-term care to implement best practices in fracture prevention (ClinicalTrials.gov - NCT04947722).



Dr. Alexandra Papaioannou



[L-R] Dr. Justin Lee, Dr. Eric Wong, Dr. Christina Reppas, Dr. Christopher Patterson, Mr. Christopher Gabor



Delirium
Research
Group

An interdisciplinary collaboration involving Hamilton Health Sciences, St. Joseph's Health Care Network and McMaster University, supported by the GERAS Centre.



BRAIN HEALTH; INNOVATION & TECHNOLOGY

ADVANCING NON-INVASIVE PROGNOSIS OF AMNESTIC MILD COGNITIVE IMPAIRMENT

We have a strong industry-academic partnership with Darmiyan, an innovative software company based out of San Francisco USA, and working in collaboration with the Centre for Aging & Brain Health Innovation (CABHI) at Baycrest, Toronto Canada. Together our research tested how accurate and reliable Darmiyan technology is in predicting and detecting Alzheimer's disease. It uses new software that can identify brain changes that may not be visible on traditional magnetic resonance imaging (MRI) scans.

BRAIN HEALTH

COMPASS-ND

CCNA
Canadian Consortium
on Neurodegeneration
in Aging



CCNV
Consortium canadien
en neurodégénérescence
associée au vieillissement

Comprehensive Assessment of Neurodegeneration and Dementia (COMPASS-ND) is the signature clinical study of the CCNA. The goals of this study include learning about who is at risk for developing dementia and determining the most effective methods of detecting dementia.





Dr. Richard Sztramko [L]: Dr. Anthony Levinson [R]

BRAIN HEALTH; INNOVATION & TECHNOLOGY

BRINGING CLARITY TO DEMENTIA

A diagnosis of dementia is a stressful experience. An overwhelming amount of information needs to be taken in during an already difficult time. Our goal is to provide easy access to simple lessons and helpful resources that allow individuals to learn about all aspects of dementia at their own pace, in their own homes.

iGeriCare includes quick and easy lessons. Individuals may access information at their own pace. Lessons were developed by experts in geriatrics and mental health. Individuals can connect with experts and others who are facing the same challenges through our live events and discussion boards. Join us for a series of live-streamed events with experts in dementia. If you can't make it, don't worry! All our live events are archived on our social media channels.

RESILIENCE & FRAILITY

MOVING EVIDENCE INTO PRACTICE WITH TECHNOLOGY

The Fit-Frailty Assessment and Management App is a comprehensive measure of frailty. It was designed to help save time in busy clinical settings and be easily completed by older adults and caregivers. The full, interactive assessment is completed in person and includes physical performance measures which can identify individuals at risk of sarcopenia in addition to frailty. Available for download in the Apple Store.



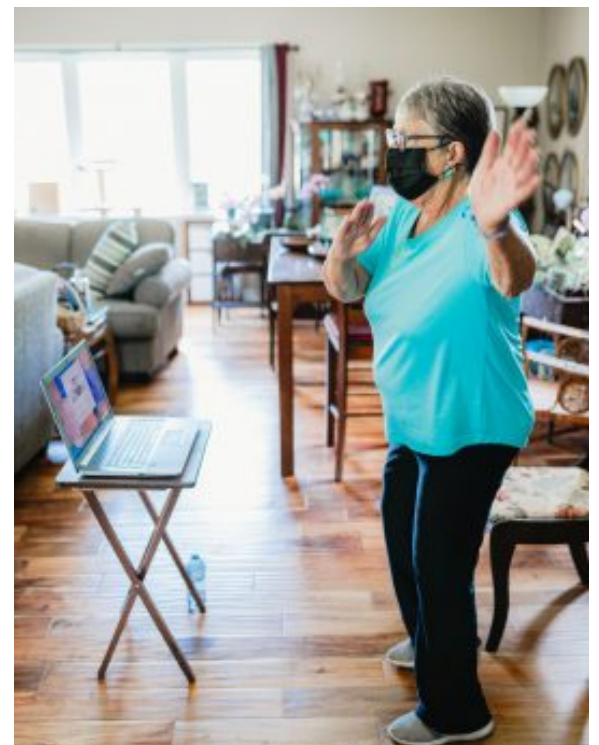
Dr. Courtney Kennedy Dr. Sarah Park

BRAIN HEALTH; RESILIENCE & FRAILITY

DANCING ACROSS CANADA FOR BRAIN HEALTH & MOBILITY

GERAS Dancing for Cognition and Exercise (DANCE) is a therapeutic program developed with rehabilitation and geriatric medicine expertise that improves brain health and uses functional exercises to enable participation in everyday activities. GERAS DANCE provides a fun way for older adults to exercise regularly as part of overall medical management incorporating scientific principles of neuroplasticity, motor learning, and dual-task training. With a broad range of dance styles and music from rock and roll to jazz – combined with lots of laughter – there is something everyone will enjoy.

GERAS DANCE has an evidence-based curriculum from prevention to rehabilitation. Classes can be delivered in-person, virtually live-streamed, or an on-demand video series. With research on 500+ older adults (aged 60-90 years), we continue to expand the program to help improve brain health and mobility of older adults across Canada.





BRIEF CLINICAL REFERENCE GUIDE:

interRAI Fracture Risk Scale (FRS)

Identifies fracture risk in the next year. Scored from 1 (lowest risk) to 8 (highest risk).

Located in the Outcome Summary Report Page (PointClickCare®: MDS 2.0, interRAI LTCF).

	LOW RISK			HIGH RISK				
FRS Score	1	2	3	4	5	6	7	8
Hip Fracture (yearly incidence)	0.6%	1.8%	2.5%	3.1%	5.0%	6.8%	7.8%	12.6%
% LTC Residents at Fracture Risk	13.5%	18.3%	24.1%	17.0%	16.6%	2.1%	8.0%	0.5%
	56% of all LTC residents			44% of all LTC residents				
Treatment Considerations	<ul style="list-style-type: none"> • Vitamin D: 800-2000IU • Calcium: 1200mg (daily total diet & supplement) • Exercise: functional strength & balance 			<ul style="list-style-type: none"> • Vitamin D: 800-2000IU • Calcium: 1200mg (daily total diet & supplement) • Exercise: functional strength & balance • Osteoporosis medications • Hip protectors 				

BONE HEALTH

GLOBAL IMPLEMENTATION OF THE FRACTURE RISK SCALE

It is difficult to identify long-term care (LTC) residents at high risk for fracture, as the current fracture risk assessment tools in Canada, including the Canadian Fracture Risk Assessment Tool (FRAX) and the Canadian Association of Radiologists and Osteoporosis Canada Tool (CAROC) are not valid for or generalizable to LTC.

We led the development of an evidence-based fracture risk scale (FRS) that predicts hip fracture over a 1-year duration. The FRS includes LTC-specific risk factors for hip fracture and does not require bone mineral density measurements.

The FRS is a standardized instrument that automatically generates fracture risk assessments for residents as part of the Resident Assessment Instrument Minimum Data Set Version 2.0 (RAI-MDS 2.0).

The FRS is currently available in 1200 LTC homes across Canada that use Point Click Care electronic medical record software and has international

recognition at the Australian Institute for Musculoskeletal Science.

Globally, the FRS has implications for health strategy, service delivery, and care planning that impact policy choices for vulnerable residents living in LTC.

PointClickCare®



Dr. George Ioannidis



TRAINING THE NEXT GENERATION



Ashlee
Azizudin



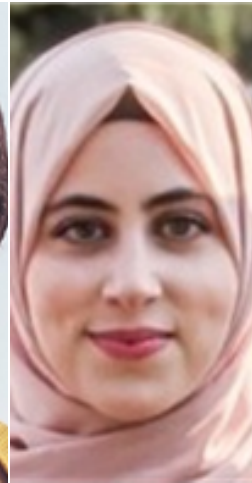
Momina
Abbas



Konrad
Grala



Chinenye
Okpara



Hajar
Abu Alrob



Ahreum
Lee

THE NEXT GENERATION OF LEADERS

TRAINING FROM HEALTH RESEARCH METHODOLOGY TO ENGINEERING TO ADVANCE GERIATRIC CARE

We are committed to providing trainees and early-career researchers with innovative research, mentoring and training opportunities within our geriatric medicine research program. We lead a multidisciplinary research team at the GERAS Centre for Aging Research ranging from undergraduate students to post-doctoral fellows and all faculty levels from junior to senior scientists. Our research trainees have secured national scholarship funding and continue to lead successful careers in geriatric medicine, nursing, rehabilitation science, kinesiology, and health research methods.

Our trainees are actively involved in national training programs.

McMaster Institute for Research in Aging (MIRA) to transform the experience of aging by transforming the science of aging with cross-faculty research collaboration.

Natural Science and Research Council Canada (NSERC) sMAP CREATE training program to foster a world-class, collaborative training environment and provide highly qualified personnel with unique experiential training opportunities in a multi-university, multidisciplinary program centered around technologies and best practices for smart mobility for the aging population.

Canada's technology and aging network at AGE-WELL training and mentorship program to train innovators of tomorrow as they accelerate the delivery of technology-based solutions to make a meaningful difference to the lives of Canadians. **Canadian Geriatrics Society Mentorship** to connect with trainees with experienced clinicians to provide guidance towards a career in geriatric medicine.



CIHR POST-DOCTORAL FELLOWSHIP
Dr. Caitlin McArthur



INTERDISCIPLINARY RESEARCH



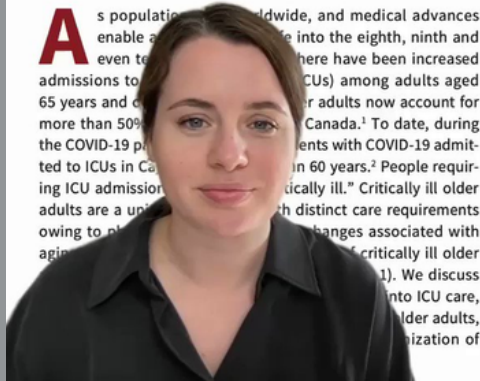
Using the Canadian Longitudinal Study on Aging (CLSA), a national long-term study that will follow approximately 50,000 individuals for 20 years. We have a CLSA working group including members in rheumatology, engineering and medicine to investigate osteoporosis, fractures and frailty in older adults. Trainees are embedded in studies and learn from world experts in health research methodology and clinician scientists.

DR. OLIVIA GEEN AT OXFORD

Optimizing care for critically ill older adults

Olivia Geen MD, Bram Rochweg MD MSc, Xuyi Mimi Wang MD MME

■ Cite as: *CMAJ* 2021 October 4;193:E1525-33. doi: 10.1503/cmaj.210652



As population ages worldwide, and medical advances enable more people to live into the eighth, ninth and even tenth decades, there have been increased admissions to intensive care units (ICUs) among adults aged 65 years and older. Older adults now account for more than 50% of ICU admissions in Canada.¹ To date, during the COVID-19 pandemic, more than 60% of patients with COVID-19 admitted to ICUs in Canada are aged 65 years or older.² People requiring ICU admission are increasingly "critically ill." Critically ill older adults are a unique population with distinct care requirements owing to physiological changes associated with aging (eg, frailty, delirium, and functional decline). We discuss the implications of these changes for the care of critically ill older adults, including the need for geriatric assessment and optimization of care.

Key points

- The integration of geriatric principles into routine care in the intensive care unit (ICU) should be considered as part of the comprehensive care of all older adults.
- Frailty is independently associated with a higher risk of dying in the ICU and should be identified early in admission, using the Clinical Frailty Scale, based on clinical status at least 2 weeks before the acute illness.
- The ABCDEF bundle should be used to help with prevention and treatment of delirium in older adults admitted to the ICU.
- Post-intensive care syndrome includes new or worsening cognitive, physical or mental health deficits, which can persist after ICU discharge.
- Older ICU survivors may benefit from physical rehabilitation, the use of an ICU diary, and integration of geriatric principles into routine post-ICU care.

JOURNAL ARTICLE EDITOR'S CHOICE

Effects of dance on cognitive function in older adults: a systematic review and meta-analysis FREE

Patricia Hewston ✉, Courtney Clare Kennedy, Sayem Borhan, Dafna Merom, Pasqualina Santaguida, George Ioannidis, Sharon Marr, Nancy Santesso, Lehana Thabane, Steven Bray ... [Show more](#)

Age and Ageing, Volume 50, Issue 4, July 2021, Pages 1084–1092, <https://doi.org/10.1093/ageing/afaa270>



RESEARCH EXCELLENCE

AGE & AGEING EDITORS CHOICE

Our systematic review and meta-analysis reviewed 3,997 records and included 11 studies (N = 1,412 participants). Seven studies of healthy older adults and four studies with mild cognitive impairment. Our results showed dance improves global cognition function (Mini-Mental State Examination, MD=1.58, 95% CI=0.21 to 2.95) and executive function (Trail Making Test b, MD=-4.12, 95% CI=-21.28 to 13.03) in older adults. Executive function allows us to think, plan, manage, and organize daily tasks.

This systematic review and meta-analysis was awarded **Editors Choice (Impact Factor=10.668)** with 5354+ downloads and top 5% of research outputs on Altmetric. Future research is needed to determine the optimal dose and if dance results in greater cognitive benefits than other types of physical activity and exercise.

TRAINING NEW INVESTIGATORS

HAMILTON HEALTH SCIENCE NEW INVESTIGATOR FUND (NIF) AWARDEES

Hamilton Health Sciences' commitment to "first stage" research led to the creation of the New Investigator Fund (NIF). HHS NIF provides a unique opportunity to foster and support a culture of inquiry for novice investigators under the mentorship of senior staff. Dr. Patricia Hewston (2021) and Dr. Isabel Rodrigues (2022) were awarded HHS NIF to advance research in geriatrics under the leadership of Dr. Alexandra Papaioannou.



Dr. Patricia Hewston Dr. Isabel Rodrigues



Promoting healthy aging to help people age with dignity and independence

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