

FRAILITY & AGING

Population aging is dominating conversations about health care in Canada, and all over the world. As the demand for health care services increase, health care systems globally need to adapt. This means discovering new ways to deploy resources efficiently and identifying the most effective options for care and treatment, to support healthy aging.

More than chronological age, research shows that a person's level of frailty must be considered in health care delivery and planning, given that no two people age the same way. Defined as a poor state of health that arises from multiple, interacting medical and social problems, frailty increases a person's vulnerability to serious health declines. Around the world, higher frailty is linked to a number of challenges, including increased visits to hospital and a higher reliance on long-term care.

Dalhousie researchers are world leaders in defining and exploring the concept of frailty. At home and across the globe, they are actively working to provide better models to measure levels of frailty in individual patients and to inform care appropriately. Using unique mathematical models, including those that led to the development of the world's first Frailty Index, the ultimate goal is to improve quality of life for individuals, their families and their caregivers, while reducing the burden of frailty on global health care systems.

WHAT IS THE FRAILITY INDEX?

Pioneered by Dalhousie researchers Drs. Arnold Mitnitski and Kenneth Rockwood, the Frailty Index is now used around the world to help measure a person's health, taking into account how multiple health problems can interact to produce varying degrees of frailty. Given that frail individuals may not respond to certain treatments in the same way that healthier adults do, and that certain standardized treatments can pose a risk of harm to frail patients, the Frailty Index helps physicians, patients and their families make informed health care decisions using patient-specific scores. These scores also quantify how health care systems can provide more effective treatments for patients, at less risk.

COLLABORATORS

Dr. Olga Theou
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“These findings point us in a new direction when it comes to fighting Alzheimer’s disease. Where current drugs targeting plaques and tangles have not been effective, our study suggests that targeting frailty can have a greater impact. This is good news, as there is a lot one can do to prevent frailty.”

– Dr. Kenneth Rockwood, Dalhousie University,
Kathryn Allen Weldon Endowed Chair in
Alzheimer Research



CONSIDERING CHRONIC HEALTH IN CURRENT TREATMENT

Dr. Sam Searle, (see facing photo, top right) a Geriatrician at Dalhousie's Department of Medicine, is diving deeper to understand frailty in its full context. Currently on a visiting Fellowship with support from DMRF, Dr. Searle is working at the University College London to fill in data-related gaps pertaining to frail patients in hospital.

Using UK databases that don't exist in Canada, Dr. Searle is looking at community data to track patient's pre-hospital health picture, in addition to tracking it in hospital and after hospital. With typical tracking only done during and after hospital, Dr. Searle's work is a global first that can shed light on the complex interactions between acute illness and chronic health issues. Importantly, by integrating a patient's pre-hospital health picture with their in-hospital health recovery, it can become possible for patients to live independently in their own homes after an acute illness, and maintain a higher quality of life.

"Many health care systems are organized to deal with one issue at a time, but with frail patients, the acute issues that bring them to hospital are often complicated by a number of other underlying health issues," says Dr. Searle. "Instead of only treating the acute issues that we see, we need to understand the full health picture of frail patients, including chronic health issues, lifestyle and social needs, and then take these factors into account when determining the best plan

for care." In addition to his outstanding work overseas, Dr. Searle continues to collaborate with Dr. Kenneth Rockwood back at Dalhousie to improve care for frail patients in ICU.

EXPLORING THE LINK BETWEEN FRAILTY & ALZHEIMER'S DISEASE

Dr. Kenneth Rockwood is a Geriatrician at Halifax's QEII Health Sciences Centre, a professor of geriatric medicine and neurology and the DMRF Kathryn Allen Weldon Professor of Alzheimer's Research at Dalhousie University. This Chair position was established in 2000, as part of a \$1 million endowed estate gift from the Kathryn A. Weldon Charitable Foundation. A leading authority on frailty, Dr. Rockwood has over 500 peer-reviewed publications to his name, and is renowned globally for his work.

In a recent study looking at the impact of frailty in the aging brain, Dr. Rockwood and PhD candidate Lindsay Wallace made news around the world for their groundbreaking discovery that frailty is a better predictor of Alzheimer's disease than amyloid plaques and tangles in the brain. Notably, amyloid plaques and tangles have been most commonly attributed to the disease for many decades.

Indeed, the findings of this study are hopeful given that there are a number of ways that we can fight off frailty, including increasing physical activity and social interaction. That's why another Dalhousie researcher, Dr. Cheryl Kozey, is working to track these activities in older adults, with the goal of improving their frequency.



DEVELOPING TECHNOLOGY TO MOBILIZE HEALTH

“Sedentary behaviour in aging adults is a common problem that can lead to various physical and cognitive impairments,” says Dr. Cheryl Kozey, a Professor in the Schools of Physiotherapy and Biomedical Engineering at Dalhousie University. “As people live longer, we need to keep them active and engaged, in order to keep them healthy.”

In a current study, Drs. Kozey and colleagues are measuring both physical activity and social interactions in long-term care residents in Nova Scotia, using real-time monitoring technology. Developed by their industry partner Shannex Inc., this study will explore the power of the technology to ensure that long-term care residents maintain healthy activities in their care facilities, so as to maintain good health over time.

“Instead of health declining when older adults enter long-term care, this technology can track and improve the very activities that fight frailty, and contribute to positive health,” explains Dr. Kozey.

Beyond changing the frailty trajectories in those in continuing care, Dr. Kozey notes that physical and social activity have a number of health benefits and are underutilized as an intervention currently.

With continued support, Dr. Kozey and her team hope to “Mobilize Health” by developing, assessing and deploying innovative physical activity interventions to optimize healthy aging locally and around the world.

THE FUTURE OF FRAILTY

Beyond meeting increased demands for health care with a global aging population, finding ways to thoroughly diagnose and treat the whole person is critical if we are to maintain societal health and well-being. With Dalhousie being a global leader in frailty research, an investment in this work allows us to uphold our competitive standing, while impacting critical, life-changing research for individuals and their loved ones around the world.

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– Dr. Cheryl Kozey, Professor in the Schools of Physiotherapy & Biomedical Engineering, Dalhousie University

