Can you outline the key work underway at the Geriatric, Education and Research in Ageing Sciences (GERAS) Centre at St Peter’s Hospital?

Established two years ago, the Centre is new, but our strategic direction encompasses a focus on research, interprofessional education, seniors and families. Our goal is to provide exemplary care and geriatrics using a rapid learning health system. The clinical themes that we work under are: frailty, falls and fractures; dementia and delirium; and end of life. We aim to link research practice and education that includes evidence-based strategies with the goal of improving the quality of living for the elderly. This work is a collaborative effort with Hamilton Health Sciences, which was our foundation donor, and McMaster University, Canada.

What are the principal aims of this work?

Our research spans from a population health to a primary care and acute care approach, to long term care. For example, at the population level we are investigators in the Canadian Multicentre Osteoporosis Study (CaMOS): a large population-based study of over 10,000 Canadians. We were one of the first groups in the world to identify that the anti-depressant from a class of drugs called selective serotonin re-uptake inhibitors (SSRIs) were associated with an increased risk in falls and fractures. Also, we found that frailty can occur across the lifespan. It is obviously more common in adults over 75 years old, but starts increasing in people aged between 50 and 65 years. This is an interesting finding because it means there may be interventions we can implement at an earlier age.

Can you discuss your research on the relationship between type 2 diabetes, musculoskeletal ageing and increased frailty?

Some of the diabetes and frailty studies we have been involved in have taken place at the magnetic resonance imaging (MRI) level. From this work we have found that those with diabetes have more fat in their muscle, which translates into a decrease in their gait speeds; one of the early markers of frailty. What we deduced from the MRI work is that diabetic people have more fat in their muscles, preventing their muscles from performing optimally.

Are there any upcoming projects that you are particularly enthusiastic about being involved with?

Yes, the $8 million federally-funded TAPESTRY programme is a very exciting and novel study. It targets the primary care setting, with volunteers going to senior’s homes and identifying those at risk and the goals of the seniors in their care. Within this we are studying the primary care levels to identify those who are at risk of frailty or those who are frail. We are then working with the family health team and the patient to reduce the risk of frailty and its consequences, such as falls and fractures. In terms of the GERAS Centre, we are focused on identifying those who are caregivers. Sometimes the primary care physician may not be aware of patients who are also caregivers, and so there are challenges in what they can do to improve the quality of living for those caregivers.

Can you provide a brief overview of some of the other collaborative studies you are involved with?

HIP ATTACK is a large study that involves getting patients to surgery as quickly as possible following a hip fracture to prevent, for example, lung clots, heart attacks and death. One of the interventions that we are doing is using melatonin to determine if we can reduce the risk of delirium post hip fracture. We also received a recent grant from Medical Pharmacies Group Limited to optimise the appropriate use of psychotropic drugs in long-term care. This may include a programme with a non-pharmacological base called The Montessori Way™ method, involving seniors and the gentle persuasion approach.
A new lease on life

By translating research into practical outcomes, the Geriatric Education and Research in Aging Sciences Centre is successfully empowering independence among the elderly, and reducing vulnerability from frailty.

**AS THE POPULATION** ages, the healthcare community faces tough challenges to ensure quality of life in this demographic. A unique collaboration between Hamilton Health Sciences’ St Peter’s Hospital and McMaster University has positioned itself as a leader in successful team-based delivery of aged care. Based in Hamilton in Ontario, Canada, the Geriatric Education and Research in Aging Sciences Centre (GERAS) offers a formidable education and research platform that enables access to leading senior medicine experts, psychiatrists who specialise in geriatric care, interprofessional teams and concentrated ambulatory practice.

The Centre’s building blocks are respect, care, accountability and innovation. “The goal is to allow for the best care of seniors in their own homes, which is the long-term care setting, rather than transferring them to an acute care centre where a number of consequences may occur,” explains Dr Alexandra Papaioannou, Professor of Medicine at McMaster University and Scientific Director of GERAS. The model that GERAS is particularly focused on expanding is one of empowering independence among the elderly, which ultimately should lead to a healthier ageing population who are more active and engaged in their own care. Such a model requires the active engagement of families and communities to help support this independence.

**A COMPREHENSIVE FIELD**

One of the key factors that has enabled GERAS to foster such an approach is the breadth of research that has been undertaken at St Peter’s Hospital and McMaster University. From identifying and understanding key risk factors to knowledge translation initiatives, the researchers have succeeded in taking the ideas developed through theoretical research and turning these into actions. Piloting new innovations in therapies and healthcare practices through testing and evaluation has been critical.

The team has found that one of the biggest problems with the elderly suffering from reduced energy, physical ability, cognition and health — what is termed as frailty — is how vulnerable it can make them to life-threatening diseases and syndromes. The CaMos Frailty Index is a tool that has been developed to enable the identification of the leading causes of frailty in the elderly. “By looking at the data we collected, we were able to identify that frailty happens for a number of reasons, including a lack of social support, appropriate nutrition, exercise and medication, and also as a result of an increase risk in falls and fracture,” Papaioannou reveals.

**RISK FACTORS**

In 2015, the GERAS Centre was awarded a Research Strategic Initiatives grant from Hamilton Health Sciences. This competitive programme funds new studies of high strategic priority to support emerging research areas and teams with high potential for success and for achieving national or international stature within 5 to 10 years. This funding enables GERAS researchers to build on one of their primary themes (frailty, falls and fractures) to expand the GERAS Frailty-Sarcopenia Collaborative. In this work, the researchers will be targeting seniors in primary care and reviewing a range of factors that influence frailty. “We are excited about what the future may bring in terms of new learnings and understanding in this field,” Papaioannou enthuses.

**IMPROVING CARE IN AN LTC SETTING**

There is a high prevalence of fractures within long-term care (LTC) compared with people in the general community. People in LTC are exposed to nearly double the risk of a hip fracture than someone of similar age living other places. “In LTC we have found that individuals with dementia, those with osteoporosis who tend to be wandering around and those who are able to walk on their own are at a much higher risk of fracturing, as well as those on medication,” Papaioannou asserts. This had led the researchers to look at how they can work closely with LTC providers and healthcare practitioners to reduce these risks.

For example, by supporting interprofessional learning in the LTC setting, they have been furthering their work in an initiative entitled Vitamin D and Osteoporosis in LTC (ViDOS). The Ontario Osteoporosis Strategy for LTC is a province-wide programme of outreach activities aimed at increasing awareness about fracture prevention specifically in LTC, with a focus on the importance of appropriate vitamin D and calcium intake, and on falls prevention. The work of Papaioannou and her team is exploring how to reduce the risks of falls and fractures by improving the use of calcium and vitamin D in LTC homes, where they have found that vitamin D can help decrease the risks up to 20 per cent.

One target area for the GERAS group has been improving intravenous (IV) delivery within an LTC setting to enable better treatment of the elderly in care homes. The researchers received a Local Health Integration Network grant for investigating IV therapy in LTC homes. It is hoped that through this work unnecessary emergency department transfers and hospitalisations can be avoided by developing best practice for IV treatment delivery in these places. This is a truly interdisciplinary study with partners including pharmaceutical organisations, nurse practitioners, the LTC community, emergency services, geriatricians and physicians.
PHARMACOLOGICAL AND NON-PHARMACOLOGICAL APPROACHES
On a much bigger scale, the GERAS team has been involved in the Canadian Longitudinal Study on Aging for the last five years. This is one of the largest longitudinal studies in the world that has been designed to help understand the factors supporting healthy ageing and to identify areas that can be improved on. Papaioannou’s team is focused on areas such as frailty and dementia to support the delivery of this national initiative. Ultimately, the researchers are dedicated to identifying new information and opportunities to enable early identification of problems and risk factors, as well as improving the delivery of proactive care within the elderly LTC setting.

They have also been able to implement a number of strategies in LTC homes to improve fracture prevention and osteoporosis treatment. For example, both pharmacological and non-pharmacological approaches to reducing the risk of fractures and injury in seniors in LTC have been developed, which support decreasing the fracture burden. These have been prepared in collaboration with Osteoporosis Canada and are supported by the Ontario Osteoporosis Strategy. “Our goal is to improve quality in living and reduce the pain from fractures in those end of year times for seniors,” Papaioannou concludes.