University of Regina

Centre on Aging and Health Newsletter

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"IMPROVING OLDER ADULTS' QUALITY OF LIFE THROUGH USER-FRIENDLY ADVANCED TECHNOLOGIES": AN EPIC KNOWLEDGE TRANSLATION EVENT

The Centre on Aging and Health (CAH) 2019 Brain Awareness Week was one to remember for years to come. The CAH partnered with the AGE-WELL Network of Centres of Excellence and the Saskatchewan Health Authority for a massive knowledge translation and exchange event called "Improving Older Adults' Quality of Life through User-Friendly Advanced Technologies."

For this event, AGE-WELL researchers visited Regina from all over Canada to showcase technologies for improving the lives of older adults. AGE-WELL is a pan-Canadian network that brings together researchers, older adults, caregivers, partner organizations and future leaders to accelerate the delivery of technology-based solutions that make a meaningful difference in the lives of Canadians. Currently, AGE-WELL includes more than: 200 funded and affiliated researchers from 40 universities and research centres; 250 industry, government and non-profit partners who work closely with AGE-WELL on solutions for healthy aging; and 500 trainees who are the next generation of leaders in the field of aging and technology. AGE-WELL's goal is to help older Canadians maintain their independence, health and quality of life through technologies and services that increase their safety and security, support their independent living, and enhance their social participation.

Lili Liu, Ph.D., presents at the evening "Rapid Fire" lecture.

According to the CAH director, Dr. Hadjistavropolous, advanced technologies are the key to improving issues related to aging. He states, "Through my work with AGE-WELL, I have come to believe that the greatest solutions that will improve the quality of life of older adults who suffer from Alzheimer's disease and/or frailty may not come from the health sciences but could come from engineering and advanced technologies." The Regina event allowed for AGE-WELL researchers to demonstrate these types of technologies to the public and key decision makers in Saskatchewan.

Public events took place on March 14, 2019 and had two parts. The first part was an open come-and-go series of technology demonstrations that took place at the Wascana Rehabilitation Centre. The researchers demonstrated how their technologies can improve the lives of older adults using interactive stations. "Rapid fire" (i.e., maximum of three minutes per presenter) back-to-back presentations of each technology were then given at the University of Regina in the evening. The purpose of the events, which were of special interest to older adults and health professionals, was to bring awareness of these technologies to the public. The events were well-attended and reached over 250 community members.

In addition to the public events, the researchers met with directors of long-term care from the Saskatchewan Health Authority. This meeting allowed the researchers to directly speak with health care decision makers about how their technologies can be implemented into long-term care homes throughout Saskatchewan.

The researchers also met with Ministry of Health officials in order to mobilize knowledge about how their technologies can be promoted or implemented through policy decisions. A description of each technology specifying the problem that the technology is trying to solve was presented to the Ministry. Specific policy recommendations and/or barriers were also discussed. The researchers showed policy makers how their technologies significantly impact the lives of older adults to demonstrate why they should take interest in them.

According to Dr. Thomas Hadjistavropoulos, "It may take an average of 17 years for research findings that are useful for patients to find their way into practice". The Regina event was aimed to facilitate faster adoption of beneficial solutions. The Regina Leader Post, and the local Global and CTV news stations covered the event.

The AGE-WELL researchers brought with them a wide variety of technologies to be demonstrated. A description of each product/technology follows.

AGE-WELL researchers meet with directors of long-term care from the Saskatchewan Health Authority.

WHAT WERE THE TECHNOLOGIES?

The Community ASAP: Using Technology to Manage Dementia-Related Wandering

Project Lead: Lili Liu, Ph.D. (University of Alberta)

Collaborating Investigators: Noelannah Neubauer, Doctoral Candidate, Christine Daum, Ph.D., Antonio Miguel Cruz, Ph.D., & Adriana Rios Rincon, Ph.D.

Community ASAP is a voluntary alert system that mobilizes communities to keep watch for older adults living with dementia who become lost.. Project lead, Lili Liu of the University of Alberta, describes Community ASAP as "A mobile app for anyone who is interested in serving as an extra set of eyes on the ground for first responders when an older adult with a cognitive impairment gets lost." Community members can download the app and receive alerts sent straight to their phone with information on who is missing and instructions on what to do if they see that person.

For more information: lili.liu@ualberta.ca

A Rating Index for Mental Health Mobile Applications

Project Leads: Peyman Azad Khaneghah (PhD student) & Lili Liu, Ph.D. (University of Alberta)

Collaborating Investigators: Noelannah Neubauer, Doctoral Candidate, Antonio Miguel Cruz, Ph.D., & Adriana Rios Rincon, Ph.D.

Another product evaluates the numerous mental health apps available on the market to help users identify apps that are of high quality by developing a quality index. This index is based on theories of usability, technology acceptance models, and frameworks for evaluating mental health apps, as well as app users' experiences. Consumers, including older adults, caregivers, and health care providers can use the index to help them determine which apps may actually improve their mental health versus which ones are gimmicks.

For more information: lili.liu@ualberta.ca or azadkhan@ualberta.ca

Noelannah Neubauer, Doctoral Candidate, at the afternoon demos at Wascana Rehabilitation Centre.

Cognitive Centivizer: Activation Technologies to Measure and Improve Cognitive and Physical Function

Project Lead: Mark Chignell, Ph.D. (University of Toronto)

Collaborating Investigators: Andrea Wilkinson (former Postdoc), Farzad Nejatimoharrami (Postdoc), Henrique Matulis (Masters/Ph.D), Bella Zhang (incoming Masters), & Thanyathorn Thanapattheerakul (visiting Masters student from Thailand)

The cognitive centivizer addresses the problem of limited cognitive assessment and activation for older adults, and it does so through fun and engaging games and activities. It consists of a tablet with a suite of Target Acquisition games that will measure six cognitive functions by end of summer 2019 (currently cognitive speed, response inhibition, and working memory are assessed), as well as a set of six easy-to-use, tangible, and robust input buttons. After playing the games, the user's cognitive status is then tracked and monitored on a dashboard website (with the consent of the individual). The cognitive centivizer is an enjoyable and reliable way to stimulate cognitive activities and monitor cognitive status for older adults.

For more information: chignell@mie.utoronto.ca

The Experiential Centivizer

Project Lead: Mark Chignell, Ph.D. (University of Toronto)

Collaborating Investigators: Andrea Wilkinson (former Postdoc), Farzad Nejatimoharrami (Postdoc), Henrique Matulis (Masters/Ph.D), Bella Zhang (incoming Masters), & Thanyathorn Thanapattheerakul (visiting Masters student from Thailand)

The experiential centivizer brings back driving and travel experiences for older people who may not be as mobile as they used to be. Using the driving similar they can go on a shopping trip, or drive down memory lane to see and hear the moving stars and singers from when they were young. They can also select travel videos to explore the world and can use a steering wheel to explore different viewpoints within the 360 degree videos.

Project Lead, Mark Chignell, says, "The idea is the person can get out of the house, get out of the institution, and experience the world again."

For more information: chignell@mie.utoronto.ca

Mark Chignell, Ph.D., demonstrates how the experiential centivizer works at the public demos.

The Smart Condo Platform for Observing and Measuring Activities of Daily Living

Project Lead: Eleni Stroulia, Ph.D., Lili Liu, Ph.D., (University of Alberta)

Collaborating Investigators: Adriana Rios Rincon, Ph.D., Christine Daum, Ph.D., Antonio Miguel Cruz, Ph.D., Ioanis Nikolaidis, Ph.D., and many highly qualified personnel

Healthcare professional observe and rate the ability of an individual to independently perform their activities of daily living and their functional mobility in their living environment, in order to assess their degree of independence. This process is both time-consuming and subjective. The Smart-Condo seeks a solution for this problem. It is a combined hardware-software platform that is used to unobtrusively and continuously observe, analyze, and quantify the older adults' abilities. Data are collected through sensors that monitor the environment and an occupant's activities. Its purpose is to asses older adults' abilities and assist health care professionals, families, and the older adults themselves in making decisions about interventions and care.

For more information: eleni.stroulia@ualberta.ca

Cloud-Based Data Analytics of Sensor Data

Project Lead: Bruce Wallace, Ph.D. (Carleton University)

Collaborating Investigators: Rafik Goubran, Ph.D., P.Eng., Heidi Sveistrup, Ph.D., & Haoyang Liu

With the development of a sensor mat that can be deployed in older adults' homes, there is opportunity to identify mobility and sleep biomarkers that can predict changes in health status including risk of falling. However, monitoring thousands of aging older adults in real-time is a challenge. This project is supported by IBM and is currently exploring the use of IBM Data Analytics tools, which may provide a platform to gather and analyze such a large data set.

For more information: tafeta@bruyere.org

Using Technology to Improve the Pain Care of Seniors with Dementia

Project Co-Leads: Thomas Hadjistavropoulos, Ph.D., University of Regina; Babak Taati, Ph.D., Toronto Rehabilitation Institute

Collaborating Investigators: Ahmed Ashraf, Ph.D., Kenneth Prkachin, Ph.D., Gregory Marchildon, Ph.D., Eleni Stroulia, Ph.D., Erin Browne, Doctoral Candidate, Natasha Gallant, Doctoral Candidate, & Noor Zahid

Pain prevalence among long-term care residents is as high as 80%. Persistent pain has harmful consequences (e.g., underdiagnosis of underlying problems, aggression, misuse of medication, depression, sleep disturbance, and death). Human resources constraints, insufficient pain education for front-line staff, and severe limitation in many dementia patients' ability to communicate the subjective state of pain result in undertreatment and underassessment. Three technologies that address these issues were presented.

I. Computer-Based Vision System

The first technology is a computer vision system that is being designed to monitor pain behaviours in older adults with limited ability to communicate pain due to severe dementia.

II. PACSLAC - II App

The second technology is a tablet app designed for the effective evidence-based behavioural assessment of pain in people with severe dementia. The app provides users with a checklist of pain behaviours that can guide them in determining whether or not a patient is experiencing pain and can create a graph of assessment results over time.

III. Web-Based Training Program

The third technology is an interactive web-based platform capable of providing cutting edge pain education to LTC staff who may be residing in rural and remote areas. The program is addressing a shortage in pain education particularly in these rural and remote areas.

For more information:
Thomas.hadjistavropoulos@uregina.ca or babak.taati@uregina.ca

Babak Taati, Ph.D., demonstrates the computer-based vision system for automatic pain detection. Photo courtesy of University of Regina External Relations.

Virtual Gym Platform Games

Project Leads: Victor Fernandez Cervantes, Ph,D., Eleni Stroulia, Ph.D., & Lili Liu, Ph.D., (University of Alberta)

Collaborating Investigators: Victor Fernández Cervantes, Ph.D., Postdoctoral Fellow, Noelannah Neubauer, Doctoral Candidate, and many highly qualified trainees

Physical activity has been proven to be an effective strategy towards preventing, or, at least, delaying mental decline. Personalized exercise programs are scarce and participation barriers include accessibility, transportation, and affordability. Virtual Gym is a computer-guided exercise system that provides personalized exercise instruction and feedback to older adults. It helps older adults overcome barriers to exercising by providing them with a virtual coach that provides exercise instructions and feedback specific to each user's physical abilities.

For more information: eleni.stroulia@ualberta.ca

Brain Fitness Program

Project Lead: Zahra Moussavi, Ph.D. (Unviersity of Manitoba)

Collaborating Investigators: Pourang Irani and Debbie Kelly

The brain fitness program addresses memory challenges for older adults. The program is based on the premise of brain plasticity, and targets the brain functions that are declining with normal aging and dementia, such as left-right brain connectivity and associative spatial memories. The program is offered in two modes: for healthy individuals to try it on their own, and also in a supervised mode for those with cognitive impairment with an instructor. It includes well-known games such as matching games, visual memory games, and making sentences, but also more unique games to improve associative memory.

Zahra Moussavi, Ph.D., demonstrates her Brain Fitness Program to psychology honours student, Noor Zahid.

According to project lead, Zahra Moussavi of the University of Manitoba, "the pilot study results have been so significant. It showed that all of them improved so significantly not only in the games that they played on, but also in their independent assessment."

For more information: Zahra.moussavi@umanitoba.ca

Smart Home Solution for Night Time Wandering in Persons with Dementia

Project Co-Leads: Dr. Frank Knoefel, M.D., FCFP, (Bruyere Research Institute), Heidi Sveistrup, PhD-Steering Committee, Rafik Goubran, PhD-Steering Committee, & Bruce Wallace, Ph.D. (Carleton University)

Collaborating Investigators: Laura Ault

Night-time wandering is one of the major causes of institutionalization of people with dementia and one of the main predictors of caregiver burnout. Night-time wandering can put people with dementia at risk of injury, or even death, if they leave the home. In this study, the researchers are testing a new smart home technology designed to support people with dementia known to wander. The system uses off-the-shelf smart technology such as pressure sensitive bed mats, sensors, and speakers to be able to detect when the person with dementia gets out of bed in the middle of the night and starts to wander. When the system detects the person is beginning to wander, the system send cues and diversion audio messages to assist them back to bed without disturbing caregiver sleep.

For more information: tafeta@bruyere.org

ALADIN: Adaptive Lighting for Alzheimer and Dementia Intervention

Project Lead: M. Cynthia Goh, Ph.D., & Venkat Venkataramanan, Ph.D. (Impact Centre, University of Toronto)

Disorientation is one of the symptoms of dementia that greatly limits quality of life. Patients have an increased risk of night-time falls, due to disorientation on wake up. Low-level night lights that provide visual cues by framing the objects such as doors and pathways are found to significantly reduce night-time falls. The ALADIN is a linear fall prevention and wayfinding light that helps individuals see better by providing both vertical and horizontal cues. The warm, soft light ensures sufficient alertness, without fully awaking, minimizing sleep disturbances. These smart lights work with motion, door contact, and bed occupancy sensors and can be programmed to automatically activated on motion and turn off when the individual returns to bed. This type of lighting, according to project lead Venkat Venkataramanan of the University of the University of Toronto, can help seniors waking up at night times stabilize quickly, help find their way easily, and reduce fall risks.

For more information: vvenkat@imc.utoronto.ca

Vibrant Minds: Cognitive Impairment Assessment and Intervention with Games

Project Lead: Eleni Stroulia, Ph.D., & Lili Liu, Ph.D., (University of Alberta)

Collaborating Investigators: Adriana Rios Rincon, Ph.D., Christine Daum, Ph.D., and Antonio Miguel Cruz, Ph.D., and many highly qualified trainees

Regular use of computer games can improve or maintain several cognitive functions that may deteriorate with age. Yet, if the games are not engaging or user-friendly, they can be boring, and are not used. Vibrant Minds is a suite of tablet-based games that are specifically designed to engage older adults. In fact, older adults were included in the design process. Vibrant Minds games gradually and systematically become more difficult, delivering "just-right" challenge and brain exercise to players such that they are engaging for cognitively healthy older adults as well as those with mild dementia. Preliminary findings also suggest that some games may be a proxy for mental status assessments.

For more information: eleni.stroulia@ualberta.ca

Venkat Venkataramanan, Ph.D., with the ALADIN. Photo courtesy of University of Regina External Relations.

"STRESS, EXERCISE AND BIOLOGICAL AGING": 2019 DISTINGUISHED LECTURE

This year's annual CAH distinguished lecture brought out a full house. Every seat was filled for Dr. Eli Puterman's talk entitled "Exercise, Aging and Biological Health" on January 24th, 2019. Dr. Puterman is a Canada Research Chair at the University of British Columbia's School of Kinesiology. He studies the short- and long-term effects of exercise on limiting the damage caused by chronic stress to our bodies. His research demonstrates that adults who maintain an active lifestyle do not experience the same wear and tear in the face of adversity as those who are less active.

Puterman framed his talk by situating his research as addressing larger questions, such as: how can we remain healthier longer as we age? His research speaks to these issues by examining how telomeres play a role in the aging process and how exercise and stress impact telomere health. Dr. Puterman explained to the audience that telomeres are caps that protect your chromosomes and affect the way our cells age. No matter what we do, telomeres are programmed to shorten, leading to eventual cell death and aging. However, according to Puterman's research, exercise and stress both impact telomere length. He has shown that stress can reduce telomere length, which is associated with reduced health. Conversely, exercise can lengthen telomeres and delay this process. According to Puterman, his research suggests that exercise matters to health and lifespan, in part through reversing processes of aging.

Prior to the lecture, Dr. Puterman spent the afternoon engaging in discussions with university researchers, graduate students, and older adults. Researchers from the anxiety, stress, and pain research cluster, as well as University of Regina graduate students met with Dr. Puterman to converse about research related to this area. Following this, a meet-and-greet was held between Dr. Puterman and local older adults from Regina. Combining Dr. Puterman's knowledge about stress and aging research and the older adults' own knowledge and lived experiences allowed for lively discussions on aging, exercise, health, and stress. Much discussion took place around access and barriers to exercising for older adults and how this affects stress and health.

The CAH thanks Dr. Puterman for sharing this riveting research with us!

Dr. Puterman delivering the 2019 CAH Distinguished Lecture.

Want to hear about more CAH events? Follow us on Twitter: @UofRAgingCentre

AGE-FRIENDLY REGINA SURVEY

The Centre on Aging and Health is involved with an age-friendly Regina initiative. The purpose of this initiative is to make Regina an age-friendly community. Age friendly communities are communities where the policies, services and structures related to the physical world and social environment are designed to help seniors "age actively." To kick off this initiative, the committee is administering a survey to members of the Regina community in order to gain feedback on the strengths and gaps of age friendliness in Regina. The answers to the survey will be summarized and shared with the community. All individual responses will be kept confidential. Participants will not be identified individually. The survey should take about 20-30 minutes to complete. For more information on the survey, please contact Tracy Sanden at 306.766.77283 or tracy.sanden@saskhealthauthority.ca

To take part in this survey, please visit: https://www.surveymonkey.com/r/SXVLJDJ

NOMINATIONS ARE OPEN FOR 2019/2020 INNOVATION IN HEALTH CARE DELIVERY AWARD

The **Centre on Aging and Health Award for Innovation in Health Care Delivery** recognizes Regina-based individuals, groups, or organizations, offering health care to older adults. Award recipients must have introduced an innovative approach to service provision or must have conducted field research to evaluate services or programs for older persons.

If you know of someone that would be deserving of this award, nominations (of no more than 8 pages) are to be submitted at any time up until **October 15, 2019** for the 2019-2020 Award.

For more information on eligibility, adjudication, or about how to apply, please visit
http://www2.uregina.ca/cah/about-cah/innovation-in-health-care-delivery-award
or contact Janine Beahm CAH Administrator, at janine.beahm@uregina.ca

DR. DARREN CANDOW'S MUSCULOSKELETAL LAB

Aging muscle and bone loss are vital issues to address for researchers within the fields of aging and health. Sarcopenia, defined as the age-related loss in muscle mass, strength and indices of physical performance (i.e., functionality) is associated with disability, frailty, cachexia, morbidity and various diseases. Recently, The World Health Organization has established an International Classification of Disease, 10th Revision, Clinical Modification (ICD-10-CM; M62.84) code for sarcopenia as a means for better diagnosis, assessment and treatment of the condition. Sarcopenia typically occurs in 6-22% of adult's ≥ 65 years of age and is associated with reduced bone mass and bone strength (i.e., osteopenia, osteoporosis). From a healthy aging perspective, lifestyle interventions which improve properties of aging muscle and bone are warranted.

Over the past decade, Dr. Darren Candow's research has focused on lifestyle intervention strategies (i.e., resistance training, creatine monohydrate supplementation) which improve properties of aging muscle and bone. Dr. Candow is Professor and Associate Dean – Graduate studies and Research in the faculty of kinesiology and health studies at the University of Regina where he has established an externally funded aging and musculoskeletal research program. The program has received over $1,500,00 in funding by the Canadian Institutes of Health Research (CIHR), the Saskatchewan Health Research Foundation (SHRF), and the Canadian Foundation for Innovation (CFI) combined. His program builds on research that studies the effects of resistance training on aging muscle and bone mass. Previous research has established that resistance training increases aging muscle and bone mass and strength, and indices of physical performance. Accumulating evidence in Dr. Candow's research program has shown that creatine supplementation increases the beneficial effects from resistance training. Dr. Candow has published the most peer-refereed articles involving creatine supplementation in the world.

Dr. Candow's research has led to a significant number of important findings. First, it demonstrates that whole-body resistance training (for 2-3 days per week doing 3 sets of 10 repetitions to muscle fatigue)
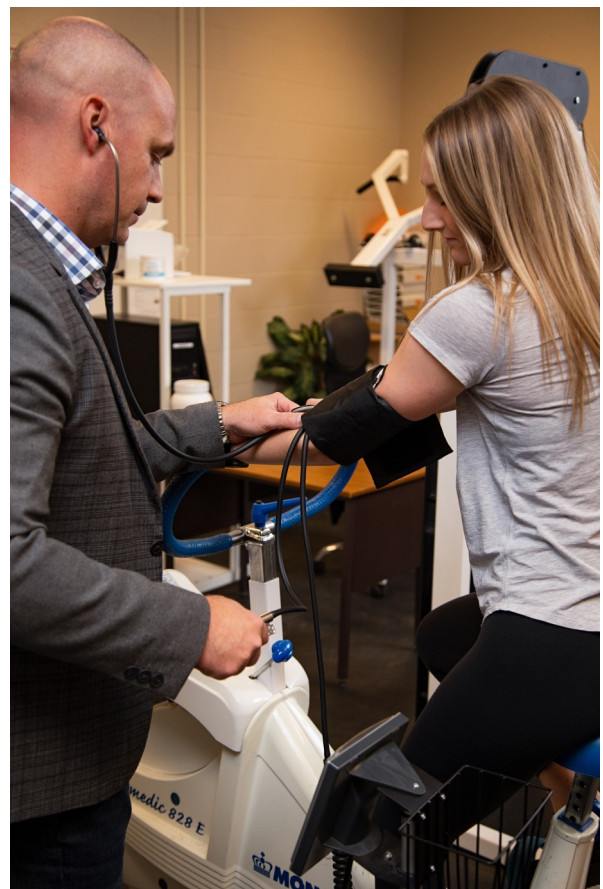
Dr. Candow in the musculoskeletal lab.

is effective for increasing muscle and bone mass, muscle and bone strength, muscle endurance and tasks of functionality. Second, it shows that high-repetition resistance training (20-30 repetitions to fatigue per set) increases muscle mass and muscle performance in aging postmenopausal women. Third, his lab has found creatine supplementation, in combination with resistance training, increases properties of aging muscle more than resistance training alone. Whereas, creatine supplementation, with no exercise intervention, only has small beneficial effects on neuromuscular performance in aging adults. His research has also shown that long-term creatine supplementation reduces the rate of bone mineral loss in aging postmenopausal females. In addition, long-term creatine supplementation increase bone strength. Lastly, he has found that creatine supplementation is safe for most aging adults. Creatine has no effect on cellular cytotoxicity or liver of kidney function. As he moves forward with his research, Dr. Candow is planning future research studies that will involve the effects of creatine and resistance training in frail older adults, individuals with type II diabetes, and individuals with mild traumatic brain injury.

Dr. Darren Candow, Professor and Associate Dean—Graduate Studies and Research, Faculty of Kinesiology and Health Studies

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Application Deadline: March 31st

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