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Opportunity 1. Development of a brief scale to assess the usability of technologies used to locate a person who is missing

Summary:

It is commonly known that 3 out of 5 people living with dementia will wander. The consequences can vary and include minor injuries, high search and rescue costs. If not found within 24 hours, there is a high chance of injury or death. The purpose of this proposal is to examine the application of technologies for assessment and management of wayfinding risks among persons living with dementia in their communities. We propose four studies. Impacts are seen through five products: (1) a reliable and validated measure that predicts risks of going missing, (2) a mobile app that uses the predicted risk levels to recommend a personalized strategy for people with dementia and their care partners to mitigate these risks, **(3) a brief scale to assess the usability of technologies used to locate a person who is missing**, (4) a national coordinated strategy for the collection of data on missing older adults to inform programs, product designs, and policies, and (5) algorithm-informed search using unmanned aerial systems (UAS) for finding missing or lost persons living with dementia.

Opportunity 2. Determining the effectiveness of a new device for hand therapy: the FEPSim™ device

Summary:

Musculoskeletal disorders (MSDs) of the upper limb affect functioning in everyday life and are correlated with a low quality of life. In the province of Alberta in 2017, the combined prevalence of hand, wrist and forearm impairment due to MSDs such as fractures and osteoarthritis with the addition of the hand impairment resulted from stroke accounted for approximately 505,872 cases. In addition, approximately 35,072 new cases (incidence) were reported. The average costs of hospital inpatient care cases totaled \$18,642,407, an increase of 7.7% compared to 2016. At present, it is a challenge to meet the hand therapy needs of Albertans because there are limited options in the clinic for measuring force of wrist flexion/extension and pronation/supination, particularly in functional activities (e.g. turning a door handle). Work simulation devices exist, but are prohibitively costly (approximately \$65,000) for most clinics. Standard force gauges would require custom setup to measure these rotational movements. This limits reliability of rehabilitation protocols and the development of ranges of normal strength to measure therapeutic outcomes. The FEPSimTM (flexion, extension, pronation, and supination), developed by Karma Machining & Manufacturing Ltd. (KM&M), an Alberta-based small-medium sized enterprises (SME), is a medical device for hand and wrist rehabilitation that can be adjusted according to the patient's capabilities during the rehabilitation process. The FEPSimTM has not yet been tested in a healthcare setting. **Objectives:** This implementation project has two objectives: (1) to determine the effectiveness of the FEPSimTM device for patients with injuries and clinical conditions of the hand, wrist, and forearm, and (2) to investigate the usability of the FEPSimTM device by hand therapists.

Opportunity 3. Using Information and Communication Technologies for managing frailty: a systematic literature review

Summary:

We believe that information and telecommunication technologies (ICT) can provide a low-cost means for managing frailty more proactively, i.e., measuring, monitoring, and preventing frailty in the older adult population on a continuous basis and in their homes. **The purpose** of this literature review is to examine the range and extent of ICTs used to manage frailty, the level of technology readiness, the evidence, and associated outcomes.