



Summer Studentship Competition Summary 2016

The Scientific Office of the Seniors Health SCN™ is pleased to provide a summary report on the status and feedback of its first Undergraduate Summer Studentship Competition. The competition aimed to increase the number of undergraduate students engaged in health and aging research across Alberta, facilitate the pursuit of knowledge, and build capacity related to the three SH SCN priority areas.

In this first year, 13 applications were submitted to the competition. The competition appears to have obtained broad reach across the Seniors Health SCN Research Community. Applications were received from students attending the three major universities in the province (Universities of Lethbridge, Calgary, and Alberta). The supervisors supporting all 13 applications were existing members of the SCN Research Community, but there was diversity in the degree to which these investigators had previously engaged with the SCN. It is possible that the smaller scope of this competition was viewed as an achievable and productive opportunity for early career researchers as well as those with established programs of research.

Each application was adjudicated by a minimum of 3 reviewers, with a 4th reviewer called in for cases where the collaborative nature of the health and aging research community could result in perceived or real conflict of interest. The assessment criteria included: a) the quality of the research proposal, b) the distinctive contribution to, and likely impact on, seniors' health and healthcare, c) the quality of the research/training/supervisory environment, and d) the student's academic record. The submissions addressed research questions relevant to the Aging Brain Care and/or Healthy Aging and Seniors Care platforms of the Seniors Health SCN.

The Scientific Office was able to support 5 high-quality applications through a student stipend valued at \$6,000 per studentship. The five studentship winners and their projects are listed in the Table. Under the guidance of their university supervisor, the students undertook their research project in the summer months and submitted a final written report to the Scientific Office in September, following the terms and conditions of accepting the award.

Table

The successful undergraduate summer studentship stipend recipients awarded in the 2016 competition.

Student	Supervisor	Univ.	Title
Grace Lee	Esther Kim	U of A	Transcranial direct current stimulation (tDCS) paired with reading treatment for seniors with acquired reading impairments
Santhosh Nathan	Jayna Holroyd-Leduc	U of C	Recommencement of anticoagulation among older adults with chronic subdural hematoma: a systematic review and meta-analysis
Ana Subota	Jayna Holroyd-Leduc	U of C	The epidemiology of dementia in epilepsy
Jonathon Thomson	Cheryl Sadowski	U of A	Function and drugs in the elderly: a scoping review
Kim Tworek	Susan Slaughter	U of A	Examining the impact of knowledge translation interventions on uptake of interventions in LTC

Notes: Univ. = University; U of A = University of Alberta; U of C = University of Calgary; LTC = long term care

The Studentship awardees were actively engaged in their research projects over the summer studentship period. As part of the terms and conditions of the award, each student and his/her supervisor were required to submit a final report to the Scientific Office, describing the project outcomes, intended use of the findings, and reflections on the student's experience.

The project abstracts can be found in the Appendix. The research projects contributed to the advancement of knowledge by both generating new evidence through primary data collection and analysis and by synthesizing the existing evidence through scoping and systematic reviews. Some students have identified an interest and opportunity to continue on with their research project by extending their involvement and activities beyond that supported by the Studentship. All five students have the opportunity to present their research through a variety of oral dissemination venues, including conference presentations, departmental rounds, interdepartmental working groups, and/or the Seniors Health Core Committee. Furthermore, all students plan to pursue publication of their work through submission to peer-reviewed journals. However, opportunities to utilize the information gained by the studentship project were not limited to publications and presentations. One project highlighted the opportunity to work with the University's curriculum committees of the relevant departments to incorporate key learnings into courses or modules to benefit the learning of future cohorts of students.

Challenges often arise when conducting research projects, and the Studentship projects were no different. One awardee experienced difficulty in recruiting research participants from the clinical population of interest. Another awardee experienced a mid-project departure of a team member, while a third awardee needed to enlist an additional team member to address the complexity of a literature search strategy. However, awardees were able to work with their supervisors to find solutions to these issues.

Awardees reported the Studentships to have provided unequivocally positive exposure and experiences. Participation in the research projects provided hands-on, experiential knowledge of conducting research in the "real-world," extending the students' factual and class-based learning. The Studentships allowed awardees to gain experiences in participant recruitment, data collection, statistical analyses, and critical appraisal. Awardees were also exposed to working as part of a large research team and in interprofessional collaboration. The Studentship opportunities were reported by awardees to have "dramatically increased [the student's] appreciation for the decisions involved in research design and execution," with the experience being viewed as valuable and complementary for students wishing to pursue a career in medicine.

The competition was successful in achieving all three of its outlined aims. The competition provided funds to engage 5 undergraduate summer students in health and aging research, the students and their supervisors pursued the acquisition of new knowledge regarding the research topic, and the competition contributed to building capacity within the Seniors Health SCN priority areas of *Aging Brain Care* and *Healthy Aging and Seniors Care*. Given its success, the Scientific Office plans to run a follow-up competition in 2017, as funding and approval allows.

Appendix

Seniors Health SCN 2016 Summer Studentship Project Abstracts

Transcranial direct current stimulation (tDCS) paired with reading treatment for seniors with acquired reading impairments

Submitted by Grace Lee, supervised by Dr. Esther Kim, University of Alberta

Background: Aphasia is a language impairment caused by damage to language areas in the brain, most commonly stroke. Most people with aphasia (PWA) also present with alexia, an acquired reading impairment. Pairing traditional speech therapy with non-invasive brain stimulation, specifically Transcranial Direct Current Stimulation (tDCS), has been shown to enhance rehabilitation outcomes. This study examines the efficacy of tDCS coupled with reading treatment for PWA.

Method: In this case study, an individual with aphasia underwent intensive speech therapy paired with and without tDCS. A within-subject experimental design was used, with the participant serving as their own control. She received 2 blocks of intensive reading therapy (3h/day x 5 days/week x 2 weeks = 30 hrs total) paired with active tDCS or sham (control) tDCS, with a 4 week “washout” period in between the 2 blocks. Order of stimulation was randomized, and the participant and therapists were blinded to condition.

Results and Discussion: Positive gains in reading comprehension and spelling were observed in our client who received tDCS combined with reading treatment. Phonological awareness increased as well, demonstrated by changes in her ability to use sublexical (sounding out) procedures to read and spell. Notably, our client (who had a diagnosis of non-fluent aphasia and severe apraxia of speech) demonstrated clinically significant improvements in spoken language following a treatment protocol focused on reading and writing. These findings suggest intensive reading treatment paired with tDCS has the potential to contribute to multimodal improvements in language functioning in individuals with aphasia and alexia.

Use of Anticoagulation and Antiplatelet agents among Older Adults with Chronic Subdural Hematoma: A Systematic Review

Submitted by Santhosh Nathan, supervised by Dr. Jayna Holroyd-Leduc, University of Calgary

Background: Subdural hematomas can result when an older adult suffers a fall, particularly among those on anticoagulants and/or antiplatelets for other medical issues. After the fall, clinicians face the dilemma of co-managing the chronic SDH (cSDH) and ongoing need for anticoagulants and/or antiplatelets. Re-bleeding of cSDH is not uncommon among frail older adults who resume anticoagulants and/or antiplatelets. Clinicians need to balance the potential adverse effects of re-bleeding (e.g. cognitive decline, speech impairment) and the adverse outcomes related to not treating conditions like atrial fibrillation and thromboembolism (e.g. stroke, pulmonary embolism). The challenging question clinicians’ face is whether or not to restart anticoagulants and/or antiplatelets in the setting of a cSDH.

Objective: To provide clinicians’ with an up-to-date summary of the evidence related to the use of anticoagulants and antiplatelets in a cSDH setting in order to help guide clinical practice.

Methods: This systematic review was an update of a review published in 2014 (search date up till July 2012). Medline, EMBASE, ISI Web of Knowledge, PLOS and Google Scholar databases were searched from Jan 2012 to May 2016, utilizing PICO and PRISMA frameworks. Observational and interventional studies with ≥ 10 study participants were included. Two authors independently reviewed all citations and full text articles for inclusion. Data was extracted using a standardized data abstraction form and quality assessed using GRADE.

Results: The full text review yielded 7 articles for inclusion (Mean=72.0). Anticoagulant resumption following cSDH had the potential for elevated risk of re-bleeding. Antiplatelet resumption following cSDH was not clearly associated with an elevated risk of re-bleeding. The ideal time to recommence anticoagulants and/or antiplatelets was inconclusive with varied regional practices.

Conclusion: Clinicians should guide decision-making at the individual patient level, considering indications and risks/benefits for anticoagulant and/or antiplatelet along with patient preferences and values. Larger multi-center prospective studies are required to confirm our findings.

The epidemiology of dementia in epilepsy

Submitted by Ana Subota, supervised by Drs. Jayna Holroyd-Leduc and Nathalie Jette, University of Calgary

Introduction: Dementia is among the top 15 conditions with the most substantial increase in burden in the past decade, and along with epilepsy, among the top 25 causes of years lived with disability worldwide. The epidemiology of dementia in persons with epilepsy, and vice versa, is not well characterized. The purpose of this systematic review was to conduct a comprehensive search of the prevalence, incidence and reported risk factors for dementia in epilepsy and epilepsy in dementia.

Methods: Embase, PsycInfo, MEDLINE, and Cochrane databases were searched from inception.

Papers were selected for full text review if they reported the incidence and/or prevalence of dementia and epilepsy. Two individuals independently performed abstract and full-text review, data extraction, and quality assessment. Random effects models were used to generate pooled estimates.

Results: 3043 citations were identified, 64 were reviewed at full-text, and 19 articles were included in the analyses. The overall period prevalence ranged from 8.1 to 17.5 per 100 persons among persons with epilepsy who developed dementia. Among patients with dementia who developed epilepsy, the pooled point prevalence estimate was 5 per 100 persons (95% CI: 1-9) in population based settings, while in clinic settings, the pooled estimate was 4 per 100 persons (95% CI: 1-6).

Conclusions: Dementia and epilepsy pose a burden on both the affected individuals and the healthcare system. There are significant gaps in knowledge, particularly in dementia development in epilepsy patients. Accurate estimates are needed to inform public health policy and understand health resource needs for this population.

Physical Function and Drugs in the Elderly: A Scoping Review

Submitted by Jonathon Thomson, supervised by Drs. Cheryl Sadowski and Allyson Jones, University of Alberta

Background: Over half (55%) of older adults use medication long-term to treat a chronic condition. Although side effect profiles are well known, evidence has not been synthesized in regards to physical function, such as muscle strength, range of motion, ambulation, and balance. This evidence gap poses a challenge for clinicians in making decisions about medication use in older adults, who are at risk of functional impairment. The purpose of the study was to conduct a scoping review to critically evaluate the literature that examines medication in chronic conditions and functional activities in older adults.

Methods: The interprofessional team, including two health-sciences librarians, developed a search strategy. Databases used include MEDLINE, EMBASE, and CINAHL. Restrictions included English language, study mean age of 65+, top 10 drug class used by older adults according to the 2012 CIHI report and having a validated physical function test.

Results: We screened 11,375 titles/abstracts, with 41 articles meeting our inclusion criteria. The studies were divided into two categories, with 20 focusing on falls, and 21 focusing on other aspects of physical function. Regarding physical function, medications that lead to motor decline were only antihypertensive agents. Most cardiovascular medications (statins, ACE inhibitors (ACE-I), thiazides) showed no impairment towards grip strength or muscle strength. The 3 studies on statins and functional status were mixed, as they did not impair exercise regimen benefits or participation, but they were not associated with preserving functional status. However, one study showed an association with a slower decline in gait speed. Conflicting evidence exists with ACE-I preserving function; one study found continuous users of ACE-I displayed slower declines in physical function. Increased risk of falls was seen within the first 3 weeks of initiating most cardiovascular medications (ACE-I, beta-blockers, nifedipine, candesartan, and thiazides). This effect, however, was transient as chronic users (≥ 12 -month use) had no risk, or a decreased risk of falling. Results on opioids and falls were conflicting. Statins increased fall risk (impaired dynamic leaning balance), but cardio-protective effects decreased fall risk. Evidence on proton pump inhibitors is inconclusive as 2 out of 3 studies show no association with falls, while one study showed an increased risk. Little research is devoted to thyroid hormones and biguanides with one study each showing no risk and an increased risk, respectively.

Conclusion: The literature provides some reassurance that the most commonly used medications in older adults are not associated with significant physical functional impairment. Further research is required to determine the impact of these medications on seniors.

The Impact of Knowledge Translation Interventions on Uptake of Evidence-Based Practices in Continuing Care

Submitted by Kim Tworek, supervised by Dr. Susan Slaughter, University of Alberta

Dissemination of evidence-based practice and care provider behaviour change has long been a challenge for researchers and policy makers. The Sustaining Transfers through Affordable Research Translation (START) study examines sustainability of a mobility activity completed by healthcare aides (HCAs) with residents, the sit-to-stand (STS) activity, in 23 continuing-care facilities. Following initial interactive education about the STS, two knowledge translation (KT) interventions were used to promote the implementation of the STS: formal information sessions and informal unit-based conversations. This study examines the effectiveness of these two KT interventions in supporting HCAs adoption of the STS activity. At each of the 23 facilities, two formal information sessions and two informal unit-based conversations were completed in four months. To assess their effect we landmarked the interventions and measured the percentage of completed STSs trials four days before and four days after each intervention. A series of mixed linear regression models were used to estimate the changes in uptake. Data were collected from 227 residents. After controlling for sex, dementia status, baseline mobility and continuing-care facility, the first informal conversation intervention had a statistically significant effect during day shift ($p=0.03$). No other individual interventions were statistically significant on day or evening shifts; however, we observed an overall increase in uptake of the STS activity across all four interventions over the 4-month period, with an absolute increase of 6.3% ($p=0.04$) during days and a 6.6% absolute increase during evenings ($p=0.004$). Time had a significant effect on both day ($p=0.05$) and evening shifts ($p=0.001$). Likewise continuing-care facility had an effect on both day and evening shifts ($p<0.001$). This highlights the importance of repeating KT interventions as part of a long-term KT strategy to allow for significant adoption of new practice in continuing-care.