Every year when we have our annual poster days for BHSc (Hons) Program students, I never fail to be amazed by the enormous range and diversity of projects our students undertake. Although people sometimes take a narrow view of what they think a “Health Sciences” project or thesis might entail, the truth is that – just like health itself – health sciences projects touch on nearly every aspect of human existence. Certainly we see lots of laboratory-based projects making use of cutting edge biomedical technology, clinical studies amassing evidence to inform rigorous health decision making, epidemiological research examining population-level associations and trends; we also see investigations in partnerships with community organizations to address key social determinants of health, evaluation of wellness initiatives, studies in the history of medicine, global health, health policy, health education, and so much more.

In addition to the students themselves, hundreds of faculty, and staff at McMaster and in the broader Hamilton community have contributed to this incredible body of work, and the BHSc (Hons) Program is so grateful to them for providing these opportunities and mentorship to our senior students. Research is almost always a team effort, and the best way to learn it is under the guidance of experienced researchers, and tackling a real research problem. Thank you, all!

Like Shakespeare says about true love in *A Midsummer Night’s Dream*, the path of research “never did run smooth”, and learning to navigate those bumps and hiccups is part and parcel of research. The abstracts in the following pages are a testament to a lot of hard work, tenacity, problem-solving, collaboration, troubleshooting, planning, analysis, interpretation, and ingenuity. Regardless of whether your project turned out the way you thought it would, you doubtless learned a lot during the journey, and that is ultimately the most important point. Congratulations to all of you!

Stacey A. Ritz
Assistant Dean – BHSc (Hons) Program
Abstract Title
Characterization of the molecular pathways in brains of mice treated with an oral selective serotonin reuptake inhibitor

Author(s) – Abdelaal Ahmed, McVey Neufeld Karen-Anne, Bienenstock John

Abstract description
Previous extensive research efforts have attempted to elucidate the mechanisms underlying the antidepressant action of selective serotonin reuptake inhibitors (SSRIs). There has been a focus on the common notion that SSRIs act via the inhibition of the serotonin transporter in the brain, thus preventing the presynaptic neuronal reuptake of serotonin. However, this view has not been universally accepted. We have recently reported (unpublished) that oral SSRIs depend on an intact vagus nerve to exert their behavioral effect on mice, as subdiaphragmatic vagotomy interfered with the central effects of oral SSRI in the tail suspension test, a mouse behavioral test of depression and despair.

Oral SSRIs have been reported to promote hippocampal neurogenesis and recent data suggests the importance of gut vagal sensory signalling in regulation of hippocampal function. We have recently reported, via PCR analysis, that sertraline, an oral SSRI, shows a modest but significant upregulation of doublecortin (DCX), a biomarker of hippocampal neurogenesis. However, the results from this PCR analysis were not conclusive and did not ascertain hippocampal neurogenesis as the three other proliferation markers tested did not show any altered level of expression.

This study tests whether hippocampal neurogenesis takes place in brains of mice treated orally with sertraline, and whether a subdiaphragmatic vagotomy influences the level of activation for the three biomarkers being tested. The three biomarkers are: (1) doublecortin (DCX), a marker for neuroblasts and immature neurons, (2) bromodeoxyuridine (BrdU) and (3) Ki-67, two cell proliferation markers produced at different stages of the cell cycle.
Abstract Title
Loss to Follow-up of Patients Being Treated at the Hamilton Regional Eye Institute

Author(s) – Abid Khizar, Qian Jenny, Chaudhary Varun

Abstract description
Current treatment regimens for Proliferative diabetic retinopathy, diabetic macular edema and age-related macular degeneration include pan retinal photocoagulation and intravitreal injections of anti-vascular endothelial growth factor drugs. Effective management of these conditions to optimize visual outcomes requires consistent patient follow-up to monitor disease activity, assess response to therapy, and administer or adjust treatment as needed. Current literature highlights trends observed in the United States and Europe. Loss to Follow up rates vary significantly amongst clinics but ranges from 22-44%. Significant factors include patients distance to their retina clinic, patient age, and patient ethnicity. There is a lack of information regarding loss to follow up data in any Canadian setting and it remains unknown if the observed trends hold true for Canadian patients. Thus, we will conduct a patient chart review to identify and compare loss to follow-up rates of ophthalmologic patients at the Hamilton Regional Eye institute.
Abstract Title
Is a Dissective Virtual Reality Model an Effective Learning Tool?

Author(s) – Aggarwal Akanksha, Birk Sapriya K., Gill Jaskaran S., Hass Katrina S., Mitchell Josh P., Fenesi Barbara, Wainman Bruce

Abstract description
Virtual reality (VR) can illustrate anatomical dissections, and its novelty has captured the interest of many educational institutions. Unfortunately, the testing of VR technology lags behind its development. This study’s objective is to (1) analyze the short-term and long-term efficacy of VR dissection technology compared to an interactive, physical dissective model, and (2) determine if spatial ability impacts the effectiveness of learning anatomy from VR models. Based on previous research in our lab, the physical dissection model is hypothesized to perform better in teaching anatomy. The interactive, physical model consists of a 3D-printed bony pelvis and fabric perineal structures. An identical VR replica of the physical model was created and displayed on an HTC Vive. Undergraduate McMaster students (n =52) participated in a crossover study where they learned female pelvic structures from both models. After each learning phase, participants were given a 15-question test. After 48 hours, they were tested again to determine if either model exhibits better long-term retention. There were no statistically significant effects on test scores due to time (p=0.944) or modality (p=0.190), indicating that the test performance is not impacted by the modality used. There was a statistically significant difference found within the VR model short-term (p=0.001) and VR model long-term (p=0.0002) total test scores between those with low and high spatial ability. This suggests that low spatial ability learners perform worse than high spatial ability learners from an interactive VR model.
**Abstract Title**
Does Familiarization with Virtual Reality Improve Learning in a Virtual Reality Environment?

**Author(s)** – Aggarwal Akanksha, Birk Sapriya K., Gill Jaskaran S., Hass Katrina S., Mitchell Josh P., Fenesi Barbara, Wainman Bruce

**Abstract description**
Despite a scarcity in substantive evidence, virtual reality (VR) is heralded as the future of anatomy education. Recent research in our lab suggests that VR headsets are substantially inferior to traditional plastic models as educational tools. This effect appears to be mediated by VR headsets’ inability to create convincing stereopsis. Our study investigates whether familiarization with the VR environment improves performance. When presented with a new learning environment (e.g., a room in VR), one may encounter a “novelty effect” where the new environment demands focus and distracts from learning. An introduction to the VR environment prior to learning could minimize this effect. Undergraduate university students with no prior formal anatomy education (n=52) were randomized to a familiarization or non-familiarization group. The former group was allowed to orient themselves with a VR car engine model, ad libitum. Then, both groups participated in a learning phase with a VR pelvis model for 10 minutes. Participants were tested using a 15-item evaluation, consisting of an equal amount of nominal, spatial, and functional questions, immediately and 48 hours after learning. Also, a mental rotation test (MRT) was administered in order to assess spatial ability. There were no statistically significant differences in overall short- or long-term evaluation scores between the familiarization and non-familiarization groups, suggesting that a familiarization phase does not improve an individual’s learning in VR. This validates previous methodologies and informs future study design as a familiarization phase is neither necessary nor a hindrance for participants learning anatomy in VR.
Abstract Title
What is known about parental attitudes towards participation in pediatric critical care research? A scoping review

Author(s) – Ahmad Abeer, Tchakerian Natalie, Duffett Mark

Abstract description
Introduction: Prospective informed consent, most often from parents or legal guardians, is the standard and ethically accepted practice in pediatric clinical research. In critically ill children, obtaining timely and fully informed consent is especially difficult.
Objective: To review published studies exploring parental attitudes toward participation in pediatric clinical research.
Methods: This scoping review includes original research of any design including parents of children admitted to an intensive care unit (ICU) or hospitalized with severe or acute illness. We excluded studies focusing on neonates and studies failing to include parental attitudes. We searched MEDLINE and EMBASE (January 2019) and two reviewers screened and assessed publications independently for eligibility.
Results: We included 19 studies reporting on 2424 parents. Ten (53%) studies asked parents about hypothetical research and sixteen (84%) studies were qualitative in design. The median number of parents in each study was 68, the median percentage of fathers included was 22% and seven (37%) studies included bereaved parents. Included studies focused mostly on parental reasons for consent refusal (68%) and general attitudes towards research participation (63%). Parents were mostly approached in the ICU or emergency room (42%) and more than one year after hospital discharge (21%)
Conclusions: This review demonstrates that parents are more accepting of certain consent processes depending on their child’s illness severity. However, most studies failed to obtain parental suggestions on potential improvements of these processes. The limited literature including fathers and bereaved parents, supports the need for developing a more holistic understanding of parental attitudes towards research.

Course Code
HTHSCI 3H03
Abstract Title
A Chart Review of Ophthalmology-Related Visits to the Emergency Department

Author(s) – Ahmad Afreem, Qian Jenny, Chaudhary Varun

Abstract description
There has been a focus on identifying factors associated with emergency department (ED) use for ocular complaints. Since ED visits are costlier than visits in an office setting for comparable medical problems, misuse of the ED for ocular complaints that could be effectively managed in a clinic setting strains already limited ED resources. The purpose of this study is to conduct a literature review to gain further insight on ophthalmic referrals in the ED. Peer-reviewed literature and abstracts were extracted from databases such as Pubmed, Embase and Medline, using keywords including: ophthalmology and ER or ED visits. Overall, studies found older age and being female were predictors of non-emergent visits. Moreover, the ED was greatly used for non-emergent ocular problems and around half of the ocular cases were non-urgent, ranging from 40-70%. Findings suggest ED resources should be better focused for patients who truly need emergent care. Implementing interventions and better triage practices would allow patients to have a more expert evaluation by an eye specialist, who are often not available on site.

Course Code
HTHSCI 4B06
**Abstract Title**  
MLB Free Agent Contract Outcomes, 2017-2018: Is There Evidence of Collusion?

**Author(s)** – Akbari-Kelachayeh Khashayar, Sweeney Brendan

**Abstract description**  
Major League Baseball (MLB) free agency has recently re-emerged as a point of contention between team owners and the Major League Baseball Players’ Association (MLBPA). Suspicions of collusion between owners designed to suppress the wages of free agents have been suggested by current and past players and by the media (1). Such collusion was common and proven in the 1980s (2). Given the seemingly unusual outcomes that have occurred in the most recent period of free agency, these suspicions appear to have some empirical basis. This study will seek to quantitively and qualitatively determine the extent to which collusion has occurred during MLB player free agency and its implications on player salaries. Furthermore, it will examine potential legal mechanisms to resolve the grievances of current free agents in the event that there is evidence of collusion while suggesting possible solutions for the next Collective Bargaining Agreement Meetings in 2021.
Abstract Title
Assessing Perceptions, Barriers and Preferences to Exercise in Patients with Systemic Lupus Erythematosus

Author(s) – Alam Arzoo, Steiner Nicholas, Jeyasingham Gabriel, Legault MD Kimberly, Matsos Mark, Beattie Karen A.

Abstract description
Objective
Cardiovascular disease is one of the most significant causes of mortality in patients with Systemic Lupus Erythematosus (SLE). Abnormally high levels of fatigue are reported in >80% of patients with SLE. Physical activity is associated with improvements in both cardiovascular disease and fatigue, however, exercise trials often involve activities that may not be pragmatic. Our objective is to gain an understanding of perceptions, attitudes, barriers and preferences to exercise in patients with SLE.

Methods
All patients ≥18 years old with SLE seen in the Lupus Clinic at McMaster University Medical Centre were invited to complete the questionnaire during their routine clinic appointment.

Results
Respondents included 41 females and 5 males (mean (SD) age 37 (12.1) years), of whom 21 reported caring for children. After performing vigorous exercise compared to not exercising, 50% of patients reported feeling better, 22% reported not knowing how they would feel, and 28% reported feeling worse. After performing moderate exercise, 63% of patients reported feeling better, 30% reported feeling the same, and 7% reported feeling worse. 87% of patients reported having barriers to exercise; including fatigue, and lack of time. 87% of respondents were willing to change their routine to include more exercise. The most preferred exercises were walking and strengthening exercises.

Conclusion
Most patients were female and of child rearing/raising years who worked full-time. Most patients believed that moderate exercise is beneficial, but identified fatigue as the most significant barrier. There is a need to create an exercise regime that considers barriers and is suitable to patients’ preferences.
Abstract Title
Belonging, Well Being, Engagement & Expression in EarlyON Child & Family Centres

Author(s) – Alchi Steven, Tadeson Kristy, Trent-Kratz Marion, Desprey Nicole, Secord Margaret

Abstract description
The Early Years Community Plan is a strategy that fosters the development of responsive, high quality, and accessible integrated early years programs and services. The plan supports the City of Hamilton’s vision to be the best place to raise a child, and aligns with the City’s strategic priorities. Recent data collected through community consultation and survey analysis highlights the need to consider and minimize barriers to accessing EarlyON Child & Family Centres (EOCFC) for underserved populations. Historically, data has only been collected from active users of the EOCFC, increasing the knowledge gap that exists for families and children not accessing the centres (non-users). This thesis sought to identify barriers preventing non-users from accessing and engaging with EOCFC and allow for the development of evidence-based recommendations to minimize such barriers. Several barriers were highlighted in the literature and are divided into the following categories: program affordability; diverse populations; parental knowledge; systemic barriers; social stigma; and social psychology and perceptions. Various strategies to minimizing the aforementioned barriers are included in the literature review of this thesis and should be considered when implementing inclusive early years programs. Further community based sampling and research is needed to identify barriers preventing access and engagement of non-users, and in turn, develop a holistic and inclusive early years education program.
Abstract Title
The Scaling of Direct and Indirect Health Indicators with Population Size: A Scoping Review

Author(s) – Amir Takhliq, Kortenaar Jean-Luc, Galloro Leandra, Bassani Diego G.

Abstract description
Over half of the world’s population currently lives in urban areas, and this is expected to increase to ~70% by 2050. A theoretical framework demonstrates that, despite spatial and temporal variations, certain characteristics of cities are power-law functions of population size. Called the urban scaling hypothesis, this suggests that cities of different sizes and forms worldwide may grow and sustain themselves in a somewhat predictable and universal manner. Objective: The scaling of health indicators as a function of population size across human settlements is poorly documented. As such, the objective of this scoping review is to systematically map the research done to date in this area and identify gaps in the existing knowledge.

Methods: This review was conducted according to the PRISMA Extension for Scoping Reviews (PRISMA-ScR). The following databases were searched from October 2018 to January 2019: Ovid MEDLINE, GEOBASE, GeoRef, Inspec, and Compendex. Using concept mapping, search terms related to three overarching concepts were identified: scaling, settlement areas, and population.

Results: 13,191 references were imported into Covidence for screening. After the removal of duplicates (n = 2500), 10,691 studies were screened for titles and abstract to determine eligibility. Based on this screening, 10,458 studies were excluded. The remaining 233 full-text articles will be subsequently assessed for eligibility (on-going).

Conclusion & Future Implications: If health indicators operate in a power-law fashion, this may have important implications for the development of public health policy and the optimization of health services and needs in regard to human settlement sizes.

Course Code
HTHSCI 4D03
Abstract Title
‘And whom do you let go?’: Exploring the theme of reversibility of triage during humanitarian response to natural disasters

Author(s) – Amir Takhliq, Yantzi Rachel, Schwartz Lisa

Abstract description
Background: The overriding imperative of saving lives in humanitarian healthcare has often left limited room for addressing suffering and dignity, especially for individuals who are dying. The ethical dilemma of triage, in particular, involves prioritization of these key utilitarian medical goods, which often come in conflict with one another. Patients with serious, life-threatening injuries are commonly triaged out, which means they receive no curative (and typically no palliative) treatment.
Objective: To explore the emerging theme of the complexity and reversibility of triage in natural disasters settings, including its causes and consequences, with particular emphasis on the role of clinical decision-making in humanitarian crises.
Methods: In-depth, open-ended interviews were conducted with 11 international humanitarian aid workers and 6 local health care providers who responded to earthquakes (Haiti, Nepal, Ecuador), typhoons/tsunamis (Philippines, India), flooding (Pakistan), and famine (Chad). Analysis was conducted using NVivo qualitative data management software, and constant comparative, thematic analysis was done concurrently with data collection. Data were analyzed using an interpretive description framework.
Results: Within the broader theme of the complexity and reversibility of triage, subthemes emerged from the interviews around the subjectivity of the clinical decision-making and judgment of care providers; the variation in triage decision-making at various time points of response following natural disasters; and the crucial role of advocacy in the reversibility of patient conditions.
Conclusion: The recovery of patients triaged to not receive life-saving treatment demonstrated a need to reevaluate the existing model of triage in humanitarian crises settings based on clinical decision-making and judgment.

Course Code
HTHSCI 3A15
Abstract Title
Assessment of Trauma-Informed Care at McMaster Children's Hospital

Author(s) – Arora Gaurav, Nisar Mahrukh

Abstract description

Background:
In 2012, ⅓ of Canadian adults reported they had experienced some form of abuse before the age of sixteen. Oftentimes, healthcare institutions which serve victims can play an inadvertent role in triggering damaging, traumatic responses due to a lack of knowledge in providing trauma-informed care (TIC). TIC recognizes the widespread impact of trauma, understands potential paths for recovery, and resists patient retraumatization.

Purpose:
This Quality Assurance Pilot Study aimed to assess the level of TIC at McMaster Children’s Hospital by focusing on four unique patient care departments (Nephrology, Inpatient Eating Disorders, Inpatient Psychiatry, and The Child Advocacy & Assessment Program Team).

Methods:
Participants completed the TICOMETER, a validated online questionnaire, to assess the level of TIC within their respective department. This tool uses 35 questions spanning across 5 overarching domains (Knowledge, Trusting Relationships, Respect, Service Delivery, and Policies/Procedures). Following this, noteworthy trends occurring between an individual’s profession and age in regards to TIC were viewed.

Results:
Overall, insufficient scores were obtained across each of the 5 Domains. Domain 1 showed the lowest score (50%) followed by Domain 5 (58.3%). Domain 1 determined the level of ongoing training regarding trauma and if potential policies supporting trauma knowledge are in place. Domain 5 analyzed the promotion of trauma-informed procedures. Based on these weaknesses, an indication for the need in regular training regarding trauma and TIC throughout each department, as well as increased awareness of the McMaster Children’s Hospital’s policies regarding trauma are warranted.
Abstract Title
Exploring the role of music therapy interventions to address trait anxiety

Author(s) – Arora Ritika, Finnerty Rachael

Abstract description
Not available
**Abstract Title**
The Effect of Corticosteroids on the TL1A/DR3 Axis in Type 2 Innate Lymphoid Cells in Allergic Asthma

**Author(s)** – Aw M, Ju X, Penn J, Salter B, Obminski C, Machida K, O’Byrne P, Sehmi R

**Abstract description**
Rationale: Type 2 innate lymphoid cells (ILC2) like TH2 cells promote type 2 inflammatory responses. ILC2s constitutively express death domain receptor 3 (DR3), whose ligand is TNF-like ligand 1A (TL1A). TL1A promotes ILC2 expansion, survival, and function independently of the alarmins IL25 or IL33. This implicates the TL1A/DR3 axis as an important type 2 inflammation co-stimulatory mechanism. Despite, corticosteroid treatment, ILC2s persist. Current evidence suggests ILC2 steroid-resistance is coordinated by TSLP. There is no research to-date evaluating the effects of corticosteroids on the TL1A/DR3 axis and the possible protective effect of alarmins.

Methods: ILC2s were magnetically enriched from the blood of mild allergic asthmatics (n=12). ILC2-enriched cells were cultured for 48 hours with IL-2 and or TSLP, IL-33 and dexamethasone. Following a 24-hour incubation, TL1A was added. Cells were immunofluorescently stained and measured with flow cytometry. ILC2s were identified as LinCD45+CD127+CRTH2+ and further gated for DR3 expression and intracellular expression of IL-5+/IL-13+.

Results: TL1A signalling significantly increased IL-5 production by ILC2s. While on average dexamethasone-treated cells had lower DR3 expression, this difference was not significant. However, dexamethasone significantly decreased TL1A/DR3 mediated IL-5 production. Furthermore, there is a trend suggesting inhibition of IL-33 and TSLP-mediated activation of ILC2s.

Conclusion: The data suggest that TL1A signalling promotes ILC2 activation. Dexamethasone does not appear to significantly modulate ILC2 DR3 expression. Additionally, dexamethasone inhibits ILC2 cytokine production and IL-33 and TSLP do not appear to have a protective effect. Further investigation of the effects of steroids on ILC2 intracellular signalling is warranted.

**Course Code**
HTHSCI 4A15
Abstract Title
Body image in primary care: A literature check-up

Author(s) – Awan Amen, Bailey K. Alysse, Lamarche Larkin

Abstract description
Primary care may play a foundational role in the early identification and prevention of body image issues and may be pivotal in the promotion of positive body image. The field of body image has shifted over the past couple decades by focusing on function, diverse samples and positive aspects of body image; however, it is unclear if research in primary care is current with this change. We conducted a systematic review to identify and categorize body image research in primary care. A search was conducted in PubMed, with secondary sources (OVID, PsychINFO, CINAHL, and Cochrane Databases) to identify articles in English. A total of 117 articles were found, of which 84 articles underwent full article review. Full review identified 75 articles fitting the inclusion criteria. The 5 most common types of studies were qualitative studies (n=36), editorials/descriptive studies (n=14), systematic reviews (n=7), randomized controlled trials (n=7), and cross-sectional studies (n=6). The research focus for the majority of the studies was related to health conditions such as eating disorders (n=16), weight (n=16), or chronic disease. Several studies were conducted with adult samples (n=16), with some using women only samples (n=12). To conclude, we categorized research on body image in primary care. The majority of the studies were qualitative in nature and sampled adults and the focus was primarily pathology-driven. The nature of the reviewed studies suggest primary care research on body image has yet to mirror the shift in body image research (i.e., focusing on function, diversity, and positive body image).
Abstract Title
CANCER-INDUCED DEPRESSION: INFLAMMATORY NEURAL PLASTICITY

Author(s) – Aziz Mahrukh, Seidlitz Eric

Abstract description
Depression is the only psychological disorder that disproportionately affects patients with cancer relative to the general population, with incidence rates two to three times higher in the cancer population compared to their healthier counterparts. Of profound importance is the fact that the cancer diagnosis in a number of patient is preceded by either symptoms of depression or a diagnosis of depression itself. This suggests that depression is not solely a reactionary emotional outcome whereby cancer may have a biological predictive capacity in the development of the psychiatric disease. Delineating the reciprocal interactions between these two diseases has potential to better inform treatment options targeted for this unique subpopulation. Through appraisal of existing literature, it is conceivable that cancer-induced depression is attributable to deleterious changes in synaptic plasticity imposed by the heightened immune response. More specifically, excess inflammatory agents, such as IL-1β and TNF-α, may deprive key regions of the brain implicated in mood and learning, such as the hippocampus, amygdala and prefrontal cortex, of their fundamental ability to retain synaptic efficacy, inevitably contributing towards the pathophysiology underlying depression. Moving forward, because the induction of neural plastic signalling has been observed within hours of administration of antidepressants, more efforts into explaining the clinical delay observed with these agents should be invested. This should help inform how to facilitate more significant and sustained therapeutics effects of future antidepressive interventions.
Abstract Title
Decoding Auditory Spatial Attention with Brain-Computer Interfacing

Author(s) – Balas Michael, Shaw Saurabh, Bruce Ian, Becker Sue

Abstract description
A major unsolved problem for those with hearing loss is the inability to process auditory cues and filter out competing sound sources. Although current hearing aid technologies are beneficial in some settings, they cannot rapidly and automatically focus, steer, and refocus attention between sound sources of interest without first knowing where the listener’s attention lies. Therefore, we sought to develop a novel approach for rapidly decoding attention exclusively from EEG responses, enabling cognitive control of hearing aid spatial filtering and solving the Cocktail Party Problem for those with hearing loss.

A series of single-subject pilot trials were carried out under audio-only and audiovisual scenarios with varying numbers of speakers and sound source locations. EEG data was recorded using a 16 electrode system. After preprocessing the EEG data, it was decomposed using Common Spatial Patterns (CSPs). Support vector machine classifiers were then trained, optimized and evaluated on features extracted from CSP-filtered signals with 10-fold cross validation. Linear models were also fit to each time instant to retrieve decoding spatial patterns over time.

Here we show that 5 seconds of EEG data can be decoded to determine attentional selection with accuracies approaching 60% and 70% in audio-only and audiovisual multispeaker environments, respectively. The CSP features revealed activations in parietal and temporal regions of the brain, potentially corresponding to their functions in sensory integration, attention and speech processing. To further refine attentional decoding, next steps involve improving artifact rejection, incorporating temporal dynamics, and applying optimized models to online brain-computer interface (BCI) multispeaker environments.

Course Code
HTHSCI 4A15
Abstract Title
Rebranding Hamilton PAWS

Author(s) – Bal Shan, Heba Maryam, Gateley Cole

Abstract description
This project is oriented to assist Hamilton PAWS as they look to transition from their current system; which helps pet-owners facing homelessness and/or other barriers access emergency shelters, where pets are not often allowed, to a new system which includes focus towards women suffering from domestic abuse enabling them to flee their situation alongside their pets. The project will mainly focus on rebranding Hamilton PAWS to help justify support and funding for future directions and goals. A part of the rebranding process involves updating the PAWS current website to increase online traffic and improve community awareness of their mission statement and goals. Through increased exposure, PAWS can garner support (i.e. donations) from surrounding Hamilton and McMaster communities for the future. Furthermore, a new mission statement will be created reflecting Hamilton PAWS current goals and values. Last, recent and local secondary research will be incorporated into an easy to read, graphic deliverable (report) that will outline the current situation and problems faced by PAWS target group and potential solutions to these issues.
**Abstract Title**
Test utilization and diagnostic utility of comprehensive Next Generation Sequencing panels for connective tissue disorders.

**Author(s)** – Belesiotis Peter, Marshall Christian, Kyriakopoulou Lianna, Basran Raveen, Mendoza-Londono Roberto, Stavropoulos Dimitri J

**Abstract description**
Breakthroughs in next generation sequencing (NGS) technologies have generated a major transformation in service delivery of genetic medicine. The ability to generate high quality sequence from thousands of genes in parallel enables cost effective and comprehensive design of targeted gene panel tests. At the Molecular Genetics laboratory within the Division of Genome Diagnostics at SickKids, NGS *in silico* gene panels have been developed from whole exome sequencing for the comprehensive testing of connective tissue (CT) disorders. The CT panel is comprised of sub-panels for the diagnosis of Ehlers-Danlos syndrome (EDS), osteogenesis imperfecta (OI), osteopetrosis, and CT disease with bone involvement. SickKids has offered the CT panel for over two years, however little data exists on utilization patterns and diagnostic yield. The objectives of this project were to determine: 1) The diagnostic yield for each gene panel and clinical features associated with a positive test result; 2) Spectrum of genetic variants and variant classification of reported variants (e.g. pathogenic, likely pathogenic, variants of unknown significance) for each panel; 3) Test utilization based on clinical features, medical speciality, and institution. One year of data (May 2016 – May 2017), including original physician referrals and diagnostic reports issued by the Molecular Genetics laboratory, was examined in a retrospective chart review. 528 cases were included (216 EDS, 151 OI, 62 CT disorders with bone involvement, 4 osteopetrosis, 95 comprehensive), with an overall diagnostic yield of 8.14%. Further analysis of phenotype and utilization will be explored to inform criteria for accepting testing requisitions.

**Course Code**
HTHSCI 4D03
Abstract Title
A Comparison of Quality of Life between Adolescents with Epilepsy, Cerebral Palsy and the General Population

Author(s) – Boldyreva Uliana, Colver Allan, Streiner David L., Rosenbaum Peter M., Ronen Gabriel M.

Abstract description
The objective of this study was to compare the association of various factors on self-reported and proxy-reported quality of life (QoL) outcomes in adolescents with epilepsy, adolescents with cerebral palsy (CP), and typical adolescents using the KIDSCREEN-52 as the measure of QoL. The study is a cross-sectional observational study, using data from longitudinal observational studies. The population included youth from ages 13-17 and included 496 adolescents with epilepsy (QUALITÉ study), 891 adolescents with CP (SPARCLE2 study), and 15,385 adolescents from the general population. With the exception of the school environment domain, our results show statistically significant, but not clinically significant (>0.5 SD) results in all domains of the self-reported KIDSCREEN-52. The school environment domain showed lower scores than the general population for both epilepsy and CP (Cohend = 0.615, d = 0.503). In contrast, the proxy-reported results showed clinically significant differences in the physical health, mood and emotions, autonomy, social support and peers, and social acceptance domains. The physical health (d = 0.626, d = 0.596), autonomy (d = 0.721, d = 0.523), and social support and peers (d = 0.943, d = 1.043) domains showed that adolescents’ with CP scores were lower than both the epilepsy and general populations. Both the mood and emotions domain (d = 0.515) and the social acceptance domain (d = 0.662) showed that the adolescents’ with epilepsy scores were lower than the general population. The results of this study show that adolescents with epilepsy or CP believe to have equal or better QoL than the general population, which can provide comfort to their primary caregivers and allow clinicians to address the parents’ concerns.

Course Code
HTHSCI 3H03
**Abstract Title**
A Student-Run Objective Structured Clinical Examination in Communications

**Author(s)** – Byles Hannah, Kim Isabelle Juhyun, Park Bomi, Sheeps Rachelle, Jewell David

**Abstract description**

**Introduction**: A typical OSCE involves the rotation of examinees through a circuit of stations at which they are asked to perform various tasks. It is traditionally composed of trained standardized patients (SP), examinees, and examiners. Its validity, reliability, and accuracy has been shown over many studies, making it the gold standard for performance assessment. However, the significant cost and time required to run an OSCE creates a barrier. This study aims to help develop an OSCE.COM, a student-run OSCE for assessing communication skills in an undergraduate setting. An OSCE.COM would consist of SP situations designed by students, students trained to act as SPs and examiners, and peer feedback.

**Methodology**: A literature search was conducted using the following databases: OVID Medline, ERIC, and CINAH. 19 studies were identified to be used in this study.

**Results**: OSCE.COM would be more cost-effective and provide a more holistic learning experience to the students. The protocol of the OSCE.COM was outlined starting with choosing of topics, choosing station types, writing station scenarios, establishing marking guidelines, running peer-review workshops, and piloting.

**Discussion & Future Directions**: OSCE.COM would provide a valuable learning experience towards students while minimizing costs. Specific learning outcomes and skill sets would be pre-identified and incorporated into students learning. Future direction include the implementation of this protocol in a real-life setting and assessing its effectiveness, cost-efficiency, and benefits.

**Course Code**
HTHSCI 3H03
Abstract Title
An Advanced Communications Course Design: Curriculum Design and Pilot Course Review

Author(s) – Byles Hannah, Park Bomi, Scheepers Rachelle, Jewell David

Abstract description
Student evaluations from HTH SCI 3S03: Communication Skills have consistently pointed to the need for the development of an Advanced Communication curriculum. Based on this feedback, a comprehensive literature search, student surveys, and expert interviews with professionals from academic and community settings were previously conducted. In this study, the curriculum for HTH SCI 4AC3: Advanced Communications was designed based on the results from our previous study. Moreover, the curriculum was adjusted based on weekly feedback from students who took the new course every Thursday from 11:30 to 2:20 in 2019 - Winter Semester. The curriculum for an advanced course focused on three themes for students to explore in greater detail: Mental Health, Vulnerable Population and Sexual Health. Additional learning tools to equip students going into the interviews with simulated patients (SPs) were provided, such as a resource pack, guest lectures, and a student-led Objective Structured Clinical Examination (OSCE). In conclusion, 19 new SP scenarios were developed to facilitate the further development of advanced communication skills and more in-depth psychosocial knowledge of client needs. Students were also given the opportunity to improve their leadership skills by facilitating and providing feedback in small groups. This course links the students to a more informed community perspective and a better understanding of key factors that lead to good outcomes such as a “warm handoff”.

Course Code
HTHSCI 4A09
Abstract Title
Commentary: Preliminary Evidence for Training-Induced Changes of Morphology and Phantom Limb Pain.

Author(s) – Chagger Jaskaran, Sivapragasam Krishihan, Wong Michael

Abstract description
Phantom limb pain (PLP) is a chronic pain disorder characterized by painful sensations that are perceived to arise from the missing limb, presumably due to structural and functional alterations in several regions of the brain (Preibler et al., 2017). In this commentary, we will comment on the effectiveness of tactile stimulation, attention, and visual reliance in an effort to reduce PLP. We propose that a combination of these elements may prove to be most beneficial in treating PLP. Nerve stimulation via electrical signals is capable of reducing PLP via passive stimulation (Johnson, 2014). Mosley et al. (2008) reported that coupling tactile stimulation with an active component is more effective in reducing PLP than passive interventions, whereby a similar approach was also followed in Preibler et al. (2017). Preibler et al. (2017) also suggests that relying on a prosthetic arm may decrease an individual’s reliance on vision. However, literature has suggested the prominent role of engaging the visual system in PLP therapy (see for example Ramachandran and Altschuler, 2009; Finn et al., 2017; Ambron et al., 2018). Recently, immersive virtual reality technology has been used as a therapeutic intervention to combine the visual system with other components (e.g. attention, tactile stimulation, etc.) to optimize PLP reduction (Ichinose et al., 2017). Future studies can further investigate the functional neural changes that may accompany increased usage of a myoelectric prosthetic arm.

Course Code
HTHSCI 3H03
Abstract Title
Interaction between chronic disease and private drug insurance on accessibility to publicly insured healthcare services in adults in Ontario

Author(s) – Chan Brandon, Guindon Emmanuel

Abstract description
Background: Public health insurance programs in Canada offer universal, first-dollar coverage for publicly insured services, such as visiting a family physician or specialist. However, public drug insurance is not universal and differences in private insurance may lead to inequities in access to publicly insured healthcare services.

Purpose: To determine the effects of need related and non-need related variables and the interaction between the effects of chronic conditions and type of health insurance on access to publicly insured healthcare services.

Methods: Data was taken from the 2014 Annual Component of the Canadian Community Healthcare Survey (CCHS). Variables regarding demographics, health status, insurance, and income/education were included in the analysis. Three outcomes were used to represent healthcare utilization: probability of a physician visit, specialist visit, or inpatient hospital visit within the last 12 months. Logistic regression (logit) was used for analysis, including interaction terms between chronic conditions and insurance type.

Results: As hypothesized, adults age 25-65 in Ontario with greater healthcare needs (e.g. chronic conditions: OR=2.133 (95% CI = 1.902-2.396)), in higher income deciles, and with private insurance (OR=1.412 (1.25-1.594)) were more likely to visit a physician. Those with chronic disease were less deterred by lack of private insurance when accessing a physician, specialist, or hospital.

Conclusions: While general income-related and insurance-related inequity exists, adults with chronic disease are less affected by a lack of private insurance when accessing healthcare. Further research must be performed to ensure other populations have adequate access to healthcare.

Course Code
HTHSCI 4A15
Abstract Title
Identifying Genes Associated with Biofilm Production in Sub-Minimum Inhibitory Concentrations of Antibiotics in *Pseudomonas aeruginosa*

Author(s) – Chee Jessica, Ranieri Michael, Yaeger Luke, Harvey Hanjeong, Burrows Lori

Abstract description

*Pseudomonas aeruginosa* is a multi-drug resistant, opportunistic pathogen associated with a variety of diseases. It can form biofilms, which are communities of cells embedded in an extracellular matrix. Biofilms confer advantages for survival and are a protective barrier against antimicrobials. Biofilm production is stimulated in sub-minimum inhibitory concentrations (sub-MIC) of antibiotics. Because this response appears to be conserved across a wide variety of antibiotics, we believe there is an underlying regulatory system that controls biofilm production in *P. aeruginosa* under sub-MIC conditions.

I am interested in elucidating this regulatory system by identifying genes that are essential for biofilm production under sub-MIC antibiotic conditions. I am doing this by screening a *P. aeruginosa* PAO1 KP Himar1 Mariner transposon library generated by our lab for mutants that show inhibited biofilm production in response to sub-MIC cefixime, tobramycin, and thiostrepton when compared with a wild type control. A mutant that shows inhibited biofilm production indicates that the gene disrupted by the Himar1 Mariner transposable element is essential for biofilm stimulation under sub-MIC conditions. Thus far, we have identified a number of gene candidates: *dsbA* encodes an enzyme that catalyzes the formation of disulfide bonds; *PA2200* is a cyclic-di-GMP phosphodiesterase; and *PA1895* is suspected to function as an acylase of acyl-homoserine lactones (AHL), an important quorum sensing signalling molecule. Overall, the genes identified from this screen not only represent the genes responsible for regulating biofilm production in *P. aeruginosa* under sub-MIC conditions, their expression may also be an indicator of antimicrobial activity.
Abstract Title
Learning through the Eyes of the Beholder: Using Eye Tracking to Understand How Novices Learn Neuroanatomy

Author(s) – Cheung Beata, Leclair Rebecca, Nguyen Angela, Brewer-Deluce Danielle, Heisz Jennifer, Lyons Jim, Wainman Bruce

Abstract description
Introduction: Despite student reports of high difficulty, what makes neuroanatomy challenging is still unknown. A previous study found that increasing grey and white matter contrast improves learning in students with low working memory capacities (WMC). Why contrast enhancement improves learning is unknown but may be related to how students acquire visuo-spatial data.

Aim: This study uses eye tracking to examine how novices learn neuroanatomy. Specifically, we aim to assess viewing patterns in high and low contrast brain slices for students with high and low WMC.

Methods: Undergraduate students with no previous anatomical education (n=120) are being recruited to complete an eye-tracking session containing two acquisition and two testing periods. Each acquisition period consists of 4 brain slice images (either coronal or transverse planes with high or low contrast) labeled with 12 neuroanatomical structures. The students are given 5 minutes to learn the structures. During the testing, students are prompted to identify structures on similar low-contrast slices. Finally, participants completed the Automated Operation Span Task to quantify WMC.

Results: Preliminary results show that students with high WMC performed better than those with low WMC \[f(1,32)=3.09, p=0.088\]. Students with high WMC spent longer dwelling on structures than those with low WMC. \[f(1,32)=3.09, p=0.088\]. Dwell time was a predictor of performance \[r(32)=0.40, p=0.02\].

Conclusion: Results indicate that students with high WMC perform better because they are able to hone in on structures despite distractions and focus for longer. Next steps include comparing novices and experts to understand how viewing patterns differ with expertise.
Abstract Title
Hearing ability and mental health outcomes in adult extremely low birth weight survivors

Author(s) – Chiorean Andreea, Savoy Calan, Amani Bahar, Schmidt Louis A, Van Lieshout Ryan J.

Abstract description
Introduction

Due to early life adversity, extremely low birth weight (ELBW; <1000g) survivors are more susceptible to functional limitations, including hearing challenges which have been linked to mental health problems in the general population. To our knowledge, this is the first study that examines associations between childhood hearing ability and internalizing, externalizing, and attention-deficit/hyperactivity disorder (ADHD) in adults born preterm.

Methods

Pure tone audiometry was used to assess hearing at age 8 in a longitudinally followed cohort of 80 ELBW survivors and 81 normal birth weight (NBW) control participants matched on age, sex and family socioeconomic status <> . Symptoms of internalizing problems, externalizing problems, and ADHD were self-reported at 30-35 years of age. Analyses were adjusted for sex, socioeconomic status, and verbal intelligence.

Results

A significant interaction effect was observed between birth weight group and childhood hearing ability, such that ELBW status increased the adverse effects of problems with hearing acuity on ADHD in adulthood <> . This association remained significant after adjustment for known confounding variables. No interactions were seen for internalizing or externalizing problems.

Discussion

Preterm birth status amplifies the adverse impact of childhood hearing problems on ADHD in adulthood. It is not yet clear whether the increased susceptibility to hearing impairment and ADHD is due to a etiology, or whether challenges associated with poor hearing may themselves precipitate greater ADHD symptoms in adulthood <> . Ultimately, these findings suggest that the deleterious effects of decreased auditory acuity in childhood on mental health may be increased for those born at ELBW.
Abstract Title
Lysosomal-associated membrane protein-3 (LAMP3) modulates HSV-2 infection in human vaginal epithelial cells

Author(s) – Chow Ryan, Zahoor Atif, Rempel Andrew, Nazli Aisha, Workenhe Samuel T, Mossman Karen L., Kaushic Charu

Abstract description
Herpes simplex virus (HSV-2) is amongst the most prevalent sexually transmitted viral infections, with over 417 million individuals infected globally. Previous transcriptomic studies in our lab have identified that lysosome-associated membrane protein 3 (LAMP3) is upregulated in the vaginal epithelial cell line, VK2/E6E7 (Vk2s), in the presence of HSV-2 infection. LAMP3 is a protein that cycles between endo and exosomes in the mammalian secretory pathway and is hypothesized to increase vesicular transport, which may affect viral uptake and shedding. Based on these preliminary data, we hypothesized that LAMP3 may play a role in increasing HSV-2 infectivity, either by increasing viral uptake, replication, or shedding. To investigate the effect of LAMP3 gene expression on HSV-2 infection in Vk2s, we created two co-cell lines with LAMP3 overexpression (OE) and LAMP3 knocked out (KO). All three Vk2 cell lines including wildtype (WT), OE and KO, were cultured in an Air-Liquid Interface (ALI) model that was previously optimized in the lab. Under these conditions, the vaginal epithelial cells grow and differentiate into a multilayer, more closely mimicking natural physiological conditions. Cells were infected with HSV-2, and a viral plaque assay was utilized to measure viral titers. OE cells showed significantly higher viral titers compared to WT cells, and the KO cell-line showed a significant decrease in HSV-2 titers. Confocal imaging demonstrated that HSV-2 infection upregulated LAMP3 in Vk2s at 6, 12, and 24-hours post-infection, further confirming that LAMP3 plays a role in HSV-2 infection.

Course Code
HTHSCI 4A09
Abstract Title
Not available – poster could not be printed

Author(s) – Cioana Milena

Abstract description
Not available – poster could not be printed

Course Code
HTHSCI 4B06
Abstract Title
ASRS Annual Meeting Publication Rates from 2012-2016

Author(s) – Cioana Milena, Qian Jenny, Chaudhary Varun

Abstract description
Research presented at scientific meetings as oral or poster abstracts allows scientists to share preliminary findings that would otherwise take months or years to be published in peer-reviewed journals. However, there is often no standardized process of selecting abstracts, raising questions about the quality of evidence presented. An indicator of quality of an abstract is its subsequent publication in a peer-reviewed journal, and in fact, previous research found that more than half of results from abstracts fail to be published in full, and this rate varies across specialties. No studies to date have reported the publication rate of a specialized ophthalmology meeting over a period of time. Hence, the aim of the present study was to evaluate the publication rates of abstracts presented at the American Society of Retina Specialists Annual Meeting (ASRS) Annual Meeting, a conference for retina specialists worldwide, from 2012-2016. Abstracts were extracted from the ASRS website, and their titles, or combinations of first or last authors and keywords were searched in Pubmed, MEDLINE, Embase, and Google to find a matching publication. The total 5-year publication rate was 48.2%, matching general American ophthalmology meetings. Publication rates varied significantly across subspecialty and type of abstract, with significantly more oral abstracts being published than poster abstracts. Publication rate was negatively correlated with year of abstract presentation, and positively correlated with number of abstract authors. The average impact factor of published abstracts is high, and the ASRS had a higher publication rate than other ophthalmology conferences around the world.

Course Code
HTHSCI 4B06
**Abstract Title**
A Qualitative Analysis of Popular Media Portrayals of Death, Dying and Grief

**Author(s)** – Dennis Michael, Ghaffarizadeh Seyed Aryan, Milne Eric, Sharma Aditi, Zhang Jessie, Romain Mikaela

**Abstract description**
Background: North American culture currently has a poor working knowledge of death, dying, and grief. It is valuable to examine the portrayals of such concepts in popular media, given its impact on mass perceptions and behaviours. Thus, this study examines the narratives of grief in popular films.

Methods: 41 films produced by Walt Disney (n=25) and Marvel/DC (n=16) studios were chosen and data was extracted by six observers according to: (a) characters who die and their relationship with other characters; (b) type of death; (c) production company and year; and (d) actions and quotes pertaining to grief. Thematic analyses were performed, generating codes and subsequent themes through group consensus.

Results: Findings indicate that death by murder, heroic deaths, and deaths of family members are highly prevalent and used as plot devices to provide characters with motivation, strength and purpose. The films are consistent in portraying grief through a number of common reactions: crying, expression of anger, sadness and avoidance. However, these reactions are transient in nature and often used to accelerate the plot. Additionally, grieving characters immortalize the deceased by positively remembering them and retaining mementos.

Conclusion: The films depict a rudimentary understanding of death and bereavement by portraying grief as a momentary experience with a limited range of expressions, rather than a complex lifelong process. These findings play a significant role in understanding the public perception of grief.
Abstract Title
Assessing the Effectiveness of Ibuprofen Compared to Morphine as a Pediatric Pain Management Tool Following Inguinal Surgery (AIMS): An Interim Analysis

Author(s) – Dephoure Stephanie, McGrath Melissa, Ramesh Smruthi, Braga Luis H.

Abstract description
Introduction and Objectives:
Morphine is the preferred opioid for pediatric pain management, however there are risks associated with its use. Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) such as ibuprofen have managed postoperative pain successfully with fewer negative effects. This study aims to determine if postoperative administration of ibuprofen is equivalent to morphine at managing postoperative pain in children (10-months-5-years old) following inguinal surgery.

Methods: Recruitment has occurred since July 2018. Exclusion criteria includes chronic use of NSAIDs or opioids, renal or hepatic failure, coagulation disorders, deviation to pre-established anesthesia protocol, asthma or restrictive airways, inability to receive ibuprofen or morphine, presence of co-morbidities and previous ipsilateral inguinal surgery. Data is prospectively collected on demographics, eligibility, dosages, and postoperative pain until 48-hours following hospital discharge using the Parents Postoperative Pain Measure (PPPM).

Results: Of 151 patients screened, 22 were eligible, and 129 were not. The average PPPM score of the morphine group was 3.58 (95%CI:1.96-5.2) compared to 2.5 (95%CI:-0.34-5.34) within the ibuprofen group. Within 48-hours, the morphine group was administered an average of 2 doses (95%CI:0.04-3.96) and the ibuprofen group demonstrated a 1.8 doses average (95%CI:0.66-2.94). No Tylenol was administered in either arm of the study.

Future Directions and Considerations: Due to the small sample, conclusions are unable to be made. Substantial data collection must occur before any conclusions can be made. Once a larger sample is achieved that is closer to the projected sample (n=100) another interim analysis would be beneficial to observe and analyze developing trends.

Course Code
HTHSCI 4G06
Abstract Title
Learning about Knowledge Mobilization

Author(s) – Desai Bijal, Kannan Karthik, Chu Edward

Abstract description
Not available
Abstract Title
Investigation of genetic pleiotropy between body mass index and type 2 diabetes in Europeans

Author(s) – Deonarain Deven, Meyre David

Abstract description
Global rates of obesity and Type 2 diabetes (T2D) have been increasing concurrently over the past two decades. Excessive body weight is considered to be the foremost risk factor for development of T2D and likewise, prediabetes and T2D statuses have been shown to influence BMI trajectories potentially leading to obesity. Furthermore, each disease state has a considerable amount of genetic influence that has been elucidated to date. Through genome-wide association studies (GWAS), genetic variants (SNPs) associated with each trait have been identified and it has been shown that some of the genetic influence is shared between both traits. This study will serve to further elucidate the shared genetic risk factors and pleiotropic effects between the two disease states within European populations. SNPs associated with either BMI/obesity or T2D were identified through extraction from a GWAS catalogue in addition to a literature search of PubMed and BioRxiv. Summary statistics were collected from the GWAS catalogue or the articles themselves. A total of 1070 SNPs associated with BMI/obesity were identified while the T2D SNP list is in progress. 76 publications assessing T2D SNPs were isolated from the GWAS-catalogue and literature search, of which 19 involve European populations. Prospective steps include testing association of BMI/obesity associated SNPs for T2D in DIAGRAM (Diabetes Genetics Replication and Meta-analysis) and vice-versa in GIANT (Genetic Investigation of Anthropometric Traits). Genetic correlation between the two traits will calculated using two methods: Genome restricted maximum likelihood (GREML) and cross-trait LD score regression.

Course Code
HTHSCI 4A12
Abstract Title
An event-related potential analysis of executive dysfunction in individuals with mild Traumatic Brain Injuries

Author(s) – Dhingra Nitish, Nath Niloy, Piyasena Deween, Boshra Rober, Connolly John

Abstract description
Research focused on mild traumatic brain injuries (mTBIs), colloquially known as concussions, has fostered a strong understanding of their causes, manifestations, and consequences. Issues associated with cognitive control and inhibition, a component of executive functioning, may be apparent in those with concussive histories. Despite the availability of a wide variety of relevant tests, the exact assessment of executive functioning in individuals can be quite difficult given the challenges associated with isolating the specific locus of a problem following poor performance on behavioural-based assessments. The present study aimed to use event-related potential (ERP) analysis through electroencephalogram recording in order to assess the neurological correlates of inhibition in both healthy controls and individuals who have suffered an mTBI within the last year. Specifically, data from both healthy controls (n = 28) and individuals with a previous mTBI within the last year (n = 2) were analyzed after the participants underwent a modified version of the Eriksen flanker task with an added go/no-go element. The N200 and P300 ERP components were of particular interest for making inference about inhibitory capabilities in the two groups. Although further research is required to draw strong conclusions, the preliminary analysis and visual inspection of the collected data suggest that the different conditions of the task elicit electrophysiological differences amongst healthy controls. Furthermore, these effects seem to be altered in the small set of participants who had previously suffered an mTBI. As such, further research and analysis is warranted, as ERPs may provide relevant information in mTBI assessment.
Abstract Title
Screen Time Utilization and Body Mass Index in Grade 5 and 6 Children: A Focus on Cellphone and Tablet Use

Author(s) – Diab Sara, Proudfoot Nicole A., Caldwell Hilary A. T., Obeid Joyce, Timmons Brian

Abstract description
Increased obesity rates along with increased technology use have been observed among children. This relationship between screen time and obesity has been researched with some varying results; however, studies have not focused on emerging screen devices, such as cell phones and tablets. The objective of this study is to determine if there are differences in the amount of time school-aged children spend on various screen devices, including TV, video games, computers, and cell phones/tablets, in addition to determining the association between the time spent using cell phones/tablets and body mass index (BMI). Gender differences will also be explored. Cross-sectional data were collected with school-based assessments from 562 grade 5 and 6 students. Standing height and weight were measured to calculate BMI scores (kg/m²), which were then converted to BMI percentiles. Children reported the daily average time that they spent using computers, video games, TV, and cell phones/tablets for recreational purposes via questionnaires. One-way ANOVA was used to determine differences in the time children spend using screen devices. Spearman’s correlation was used to determine the relationship between cellphone/tablet use and BMI. Preliminary results of 340 participants show that children spent more time using cell phone/tablets (99 ± 72 min/day) compared to computers (37 ± 54 min/day), video games (58 ± 76 min/day), and TV (67 ± 63 min/day), p<0.0005 for all comparisons. Full analysis will clarify the relationship between screen time and BMI among children and determine any differences between boys and girls.
Abstract Title
Review: Strategies to reduce dental caries among school-aged children

Author(s) – Dragoman Alex, Shipeolu Bolade Ajarat, Zetko Tereza, McKinlay R. J., Lavis John

Abstract description
The Malaysian Quality Assurance Program (QAP) was launched by the Ministry of Health in 2001 with the aim of monitoring health outcomes in order to improve healthcare nationwide. Oral health is one of 12 programs under the National Indicator Approach employed by the QAP. The QAP’s 2016 Technical Report found oral health to be poor among school-aged children. Dental caries were a notable condition, being both highly prevalent and highly preventable. This review investigated approaches to reducing dental caries among school-aged children.

Systematic reviews, meta-analyses, and literature reviews were searched for their findings on interventions improving dental health in school-aged children. Grey literature and unpublished results were not included in the findings. The literature found supported the use of fluoride treatments for improving dental health, and found the use of some non-fluoride interventions to be beneficial in high-risk populations. Behavioural interventions increased awareness of dental hygiene practices, but had unquantified effects on dental health outcomes.

The strength of the findings were limited by heterogeneity in the rigour of included studies, and by a paucity of data on certain interventions, including behavioural interventions. More information is needed to draw firm conclusions, and the recommended interventions must be further explored for their feasibility within the target jurisdiction.
Abstract Title
Assessing primary healthcare (PHC) services across ASEAN member states (I)

Author(s) – Dragoman Alex, Shipeolu Bolade Ajarat, Zetko Tereza, McKinlay R. J., Lavis John

Abstract description
This project aimed to provide insight into and create resources on primary healthcare (PHC) systems in Association of Southeast Asian Nations (ASEAN) member states, through researching key indicators. The project was done at request of the Quality Assurance Secretariat of the Institute for Health Systems Research, a WHO-collaborating centre and an agency of the Ministry of Health in Malaysia, in preparation for the 31st ASEAN Summit (which was held in November 2018). We examined ASEAN member states’ PHC systems in terms of: 1) healthcare financing, 2) human resources, and 3) service packages. We compiled the information into ASEAN country profiles to further compare key health system indicators across ASEAN member states and outline possible avenues for future improvement.

Currently, no agency exists to compile information across ASEAN member states’ healthcare systems; as such, the compiled data from this project provides baseline information for future health systems performance measurement and goal-setting in the ASEAN region. It was also used to generate policy recommendations as a second part to this project.
Abstract Title
Assessing primary healthcare (PHC) services across ASEAN member states (II)

Author(s) – Dragoman Alex, Shipeolu Bolade Ajarat, Zetko Tereza, McKinlay R. J., Lavis John

Abstract description

An investigation of the primary healthcare (PHC) systems in the context of human resources, health facilities, and primary care service packages revealed the similarities and differences in the challenges faced by Association of Southeast Asian Nations (ASEAN) member states. At the request of the Quality Assurance Secretariat (QAS) of the Institute for Health Systems Research (agency of Malaysia’s Ministry of Health), we identified concerns affecting some of the ASEAN member states and made subsequent recommendations to inform discussion at the 31st ASEAN Summit in November 2018.

Issues identified (from part I of this project) were grouped into common themes and divided by country income (GDP & GNI). Recommendations were made according to available evidence and with local applicability considerations. Grey literature and health databases such as PubMed and Health Systems Evidence were searched for systematic reviews to inform recommendations.

The strength of the recommendations were limited by the paucity of context-specific evidence within the ASEAN region. Thus, the proposed strategies require modification based on the economic, social, and cultural context of a nation and should account for unique health system infrastructure. Evidence is in favour of policies promoting care models that reflect national values should be explored and implemented to ensure uptake and sustained efforts.
Abstract Title
Reverse Total Shoulder Arthroplasty in the Younger Patient

Author(s) – Elsawi Rawaan, Vancolen Seline, Horner N., Alolabi B, Khan M.

Abstract description
Not available
Abstract Title
The Effect of Hormonal Contraceptive Use on Future Fertility

Author(s) – Esfandiari Negar, Blanchette Porter Misty

Abstract description
Hormonal contraceptives, such as the oral contraceptive pill (OCP) and the intrauterine device (IUD) are widely used by females in their reproductive age to be able to postpone childbearing. However, some women are unsure of the short and long-term effects of using these hormonal contraceptives on their future ability to conceive and become pregnant. This Systematic Review includes published literature from 1998 to 2018 that addresses whether a female's fertility is affected post-cessation of hormonal contraceptive use. The contraceptives included in the literature search were the oral contraceptive pill, IUDs, implant, vaginal ring and patch. The search terms used were: Hormonal Contraceptives AND fertility; OCP AND fertility; NuvaRing AND fertility; Implanon AND Fertility; IUD AND fertility; Patch AND fertility [etc.]. From the multiple searches conducted, 43 abstracts met the initial eligibility criteria of the Systematic Review. After thoroughly reading the full papers of each abstract, 12 papers remained relevant. Each of these 12 articles were critically appraised before being included in the final review. While there are some authors who describe negative effects on fertility from the use of hormonal contraceptives, and a few who report the exact opposite, the majority of literature falls in between, holding a more neutral stance. That is, most of the literature reports that after a period of time has passed from the discontinuation of the hormonal contraceptive, the female will regain her fertility. Therefore, albeit for a short period of time post cessation, the use of most hormonal contraceptives do not hinder female fertility.
Abstract Title
The Surgical Treatment of Tarlov Cysts: A Systematic Review

Author(s) – Fathalla Zina, Astaneh Behrooz, Kameda Michelle, Farrokhyar Forough

Abstract description
Background: Tarlov cysts (TCs) are sacral, perineural cysts, often found incidentally during spinal imaging. TCs can cause a range of symptoms including pain, sensory and motor deficits, numbness, paraesthesia, and urinary, bowel, or sexual dysfunctions. There is no consensus regarding the best treatment for TCs although both surgical and non-surgical routes are available. Objectives: The aim of this study is to provide a comprehensive review of the surgical treatment of TCs by systematically analyzing the findings of several case series. Methods: We searched the databases, PubMed, Ovid MEDLINE, CINAHL, and EMBASE to collect studies and included those with at least 10 patients surgically treated for TCs. A total of 16 relevant articles were identified. We extracted data from eligible studies regarding patient demographics, symptoms, and the success or failure of surgical treatments. The pooled proportions were calculated. Results: From the 16 studies, a total 238 patients were included in the analysis. Of the 238 patients, 76% (95% CI 65-85%) had complete or substantial resolution of symptoms post-operatively. There was a complication rate of 22.5% (12-34.5%). Of the 15 studies reporting long-term follow-up, 76% (66 – 85%) of patients continued to be without symptoms at mean follow-up of 21.5 months (SD=10). Conclusion: It was shown that surgical treatment of Tarlov cysts is generally effective however, complications can arise with most being of low severity. It is suggested to consider multiple factors such as, cyst size and location, on an individual basis when deciding whether or not to undergo surgery.
Abstract Title
ReFUNCTION: A Pilot Sub-Study

Author(s) – Gagnon S., Brown A., Power P., Lamy A., Spence J.

Abstract description
Adverse neurologic outcomes, including cognitive decline, delirium, and stroke, represent common complications of cardiac surgery. These complications have been associated with an increased rate of post-operative morbidity and mortality and a reduction in patients’ quality of life. Cerebral hypo-perfusion is suggested to be the common etiology of neurologic complications. Near-infrared Spectroscopy (NIRS) is a device that records regional cerebral oxygen saturation (rSco2) levels to monitor the perfusion of the brain during surgery. More studies are required to elucidate the relationship between rScO2 and post-operative functional decline, delirium and stroke in cardiac surgery. Therefore, we conducted a pilot sub-study (ReFUNCTION) to determine the feasibility of undertaking a larger multi-center cohort study to investigate this relationship. Sixty-four coronary artery bypass grafting surgery patients were enrolled in ReFUNCTION from March 2017-February 2018 at Hamilton General Hospital. There were two groups: participants who demonstrated a 20% decline in rScO2 during surgery (cerebral desaturation group), and participants who experienced no desaturation event (control group). Participants in the cerebral desaturation group experienced greater functional decline when compared to the control group. The incidence of delirium was greater in the desaturation group (14%) than the control group (6%). Stroke rates were similar in both groups. Feasibility data revealed that difficulties scheduling MRIs limited the recruitment rate of participants and the premature removal of NIRS monitors led to incomplete NIRS data collection. Thus, a large scale study could be feasible with some adjustments to the protocol surrounding MRI scheduling and NIRS use.
**Abstract Title**
Identifying Predatory Journals in Plastic Surgery: A Prospective Study and Systematic Review

**Author(s)** – Gallo Matteo, Gallo Lucas, Murphy Jessica, Duku Eric, Thoma Achilleas

**Abstract description**
In this model, rather than having readers pay to access scientific literature, the authors of published studies (as well as their institutions) absorb the cost of publication through article processing charges. Research published in open access journals is therefore more accessible and can reach a wider audience without the financial limitations imposed by a paywall. While many are embracing the open access model of publication, readers must also be cautious of new journals attempting to exploit this model for financial gain. Under the open access model, a journal’s revenue is based exclusively on the quantity, rather than the quality, of the studies that are published. In addition to contributing to the growing problem of research waste, these low-quality studies can be cited as evidence in papers submitted to non-predatory journals and “contaminate” future research. While journals, both predatory and non-predatory, are known to reach out to potential authors and reviewers via e-mail, medical professionals often lack the time, awareness, or expertise to evaluate every request they receive. As such, our study aims to categorize and evaluate the journals that send these emails as being either predatory or non-predatory according to a defined set of evaluation criteria in an attempt to answer the following question: What proportion of the unsolicited emails sent by journals to the academic plastic surgeons at our institution come from sources that are determined to be ‘predatory’?
**Abstract Title**
Transfer of Care Programs for Aboriginal Australians: A Rapid Evidence Scan

**Author(s)** – Gao Chloe, Moore Gabriel, Dawson Greer, McKinlay James

**Abstract description**

**Background**

Transfer of care initiatives aim to improve the transfer of care for Aboriginal patients to and from acute settings (hospital) and back to primary care (GPs and community). This has been identified as a priority area by the Agency for Clinical Innovation (ACI) to improve health outcomes for Aboriginal Australians.

**Review Question**

What transfer of care initiatives, with a focus on Aboriginal population, have been implemented in Australia?

**Methods**

Systematic searches were conducted of both peer reviewed and grey literature. For peer-reviewed literature, we searched Medline, the Cochrane Library and Informit.

**Results**

We identified seven publications that met the inclusion criteria. The remaining reports were identified through the grey literature search. The majority of the included papers and reports examined care pathways, which involve several different care providers and health services within an individualized treatment plan for one patient. One paper examined a transfer of care intervention from acute to primary care settings. Finally, one paper found that early intervention in terms of improving cultural safety reduced premature self-discharge. Across the studies, barriers and facilitators to successful transfer of care were also identified. Barriers included: (1) service system complexity; (2) a lack of an appropriately trained and coordinated workforce; (3) practitioners unaware of best practice guidelines; and (4) limited resources. Local referral pathways and Aboriginal Health Worker involvement were perceived as enablers.

**Conclusion**

ACI will use the findings of this review to inform the design of new programs, or modify and scale-up current programs that are promising.

**Course Code**

HTHSCI 4A09
Abstract Title
Investigating Traumatic Brain Injury in Children: A Biophysical Perspective

Author(s) – Georgy Mark, Sandqvist Erik

Abstract Description
Abstract Description: With the increasing number of children in sports, Traumatic Brain Injuries (TBI's) are on the rise. At times, these injuries may be easy to detect, with symptoms such as headache, nausea, and vomiting being evident. However, TBI's often go undiagnosed as some patients report feeling normal. The subjectivity of signs and symptomology in child athletes is becoming of upmost importance as children are encouraged to “shake it off” and continue exercising. This gap in diagnosis may be bridged via biophysical technologies. This research looks into the use of Inertial Measurement Units (IMU's) in order to measure linear, and more importantly rotational forces of the brain within the skull. The purpose of this technology is to provide physical data (in G-Forces) regarding jolts to a childís brain, during sports or exercise. This would allow the child and their guardian to understand the impact which their brain has sufficed. The IMU, which is placed on a helmet or another form of equipment, will connect wirelessly to a tablet which the coaching staff has on hand. This would scale the impact of collision and provide a green, yellow, and red alert to the coach. These alert meaning the child is fine to continue playing, the child may need to rest, and the child should exit the game, respectively. Ultimately, these are suggested alerts based off of G-Forces picked up by the helmet, which allow the child and their guardian to make an informed decision.
Abstract Title
Genetic Correlation Between Types of Aggression

Author(s) – Ghassemian Julian, Baxter Carling, Dukas Reuven

Abstract description
Because fruit flies (Drosophila melanogaster) are an excellent model system for research on the genetics of aggression, we undertook this study to elucidate genetic correlations between types of aggression in both male and female flies. We constructed aggression arenas and quantified both male-male and female-female aggressive behavior, analyzing hybrids derived from 24 distinct Drosophila Genetic Reference Panel (DGRP) lines. While we found male flies on average to be more aggressive than females, we found significant genetic variation in aggression and a significant sex-by-line interaction. This suggests that aggression varies from hybrid to hybrid as a result of natural genetic variation and that aggression is influenced by different genetic underpinnings in male and females. We found no correlation between levels of male and female aggression across the 24 DGRP hybrids, further implying a distinct genetic basis of aggression between the sexes. Furthermore, we considered other genetic correlations to determine the adequacy of certain behaviors in predicting and quantifying aggression. Wing threat display is a non-physical behavior often exhibited by male flies. We found a weak positive genetic correlation between wing threat display and physical aggression suggesting that threat is a weak predictor of a male’s actual willingness and ability to fight. In addition, lunging is a type of physical aggressive behavior exhibited by male flies which is used to quantify male aggression in many scientific papers. As we considered all types physical aggressive behaviors when quantifying male aggression in our study, we decided to investigate the associative strength between total male aggression and lunge frequency. We found a strong positive genetic correlation between lunge frequency and frequency of total physical aggression. As such, we concluded that lunges are an easily quantifiable form of aggression which can be used to appropriately measure overall aggression in male flies.
Abstract Title
Narrative Medicine and its Applications Grin End-of-Life Care

Author(s) – Green Mackenzie, Jafine Hartley

Abstract description
Narrative Medicine refers to a medical practice that incorporates the skills required to comprehend narratives, including absorbing and interpreting another person’s story and seeing the world from their perspective. Narrative Medicine may be effective in promoting empathy and understanding when employed in the care of terminally ill patients. In North America, a death-avoidant cultural attitude is reflected in a medical system that treats death as a failure rather than a natural part of life. In an attempt to combat death, physicians arm themselves with sophisticated tools and treatments that are hallmarks of modern medical technology. But while the complexity of medicine has increased, the depth of understanding and compassion when navigating human aspects of illness has suffered. This project investigates major themes that can be extracted from 15 narratives on the subjects of death and dying. Through attentive reading, physicians can come to understand that death is a universal experience, but also something that is highly personal, in that no two deaths transpire within the same context. Furthermore, narratives can foster an understanding of the barriers that prevent doctors from providing end-of-lifecare that is informed by the universality and individuality of death. Therefore, reading illness narratives has the potential to improve practical skills in narrative interpretation, while encouraging reflection among physicians on key themes related to death and dying, allowing them to recognize the subjectivity of the illness experience in a system that frequently depersonalizes patient care.

Course Code
HTHSCI 4A09
**Abstract Title**
Heritability estimates for type 2 diabetes: a systematic review and meta-analysis

**Author(s)** – Gui Xi Yao (Jenny), Ah Sen Christelle B., Meyre David

**Abstract description**
Type 2 diabetes mellitus (T2D), characterized by insulin resistance and/or abnormal insulin secretion, has become a global epidemic in the 21st century. It is well established that T2D has an inherited component. Based on twin, family and population studies, estimates for T2D heritability range from 22%-85%. Heritability is defined as a ratio of variances, by expressing the proportion of phenotypic variance that can be attributed to the variance of genotypic values. It allows for the comparison of the relative importance of genes and environment to the variation of traits within and across populations. To date, there is no systematic review and meta-analysis that provide accurate estimates of heritability and identify the factors responsible for significant variability in T2D heritability studies. The objectives of this study are to identify studies that have estimated T2D heritability via a systematic review; provide an accurate estimate of heritability values via a meta-analysis; and quantify by meta-regression the effects of biological and methodological factors contributing to heterogeneity between studies.
Abstract Title
Evaluating a primary care group-based mindfulness program: Is a pragmatic, accessible, mental wellness program effective?

Author(s) – Gummadi Yaswanta, Mbuagbaw Lawrence, Yu Carlos, Iacono Anita, Macdonald Sarah, Alvarez Elizabeth

Abstract description
Background
Mood and anxiety disorders are among several chronic conditions rising in Ontario, Canada, as well as around the world. An emerging method for the long-term management and treatment of mental health conditions is mindfulness. Integrating mindfulness programs into primary care may provide benefits through reducing healthcare utilization for chronic diseases and comorbid mental health conditions.

Hypothesis
The study aims to evaluate the effectiveness of a pragmatic mindfulness-based stress reduction program in improving anxiety and depression in a generalizable comorbid population of primary care patients.

Approach
A retrospective chart review was conducted on past program participants. Using a generalized estimating equation (GEE) approach, regression models were built to assess the association between program attendance and GAD-7/PHQ-9 scores separately. Models included covariates of gender, age, marital status and employment status and time-confounding adjustments.

Results
Program attendance (sessions) was negatively associated with both GAD-7 (β = -0.33) and PHQ-9 scores (β = -0.26), reflecting clinically significant improvement after 4-6 sessions (~2-4 points). Age was also negatively associated with both anxiety and depression (β = -0.48, β = -0.49, respectively). Women reported significantly higher depression scores than men (β = 0.16) though anxiety was not associated with gender.

Conclusion
This study demonstrates that group-based mindfulness programs can be effectively conducted in a primary care setting, to improve symptoms of both anxiety and depression. This study will inform the development of a prospective before-after study program, which may mitigate effects of time-confounding and reduce survivorship bias providing more substantive evidence of the program’s effectiveness.

Course Code
HTHSCI 4A12
Abstract Title
Utilizing Visual Aids for Emotional Regulation in Children with Autism Spectrum Disorder

Author(s) – Halajha Gazelle, McEachern Amanda, Aceti Bianca

Abstract description
Not available
Abstract Title
CD200 as a Novel Diagnostic Marker for Endometriosis

Author(s) – Hamilton Matthew, Clark David, Foster Warren G.

Abstract description
Endometriosis is a chronic gynecological condition, characterized by extra-uterine growth of functional endometrial tissue and consequent pelvic pain and infertility. Despite its considerable prevalence among women of reproductive age, it remains a particularly vexing disease with an unknown etiology and limited diagnostic tools. However, recent evidence suggests that ectopic implantation of endometrial tissue is favored by immunological elements, such as the suppression of NK cells and the promotion of Treg activity. Therefore, given the potential role of CD200 as an immunomodulator of these processes, it was hypothesized that it could show promise as a diagnostic target. The present study sought to contrast serum concentrations of CD200 in women with endometriosis and symptomatic controls throughout the menstrual cycle. Serum samples collected from women (n=24) undergoing gynecological laparoscopy for chronic pelvic pain were grouped according to menstrual cycle phase and disease status, and enzyme-linked immunosorbent assay (ELISA) was performed. Analysis revealed the sCD200 concentrations of cases were significantly greater (p=0.0179) than those of controls during the secretory phase. No statistically significant differences were identified through comparing cases and controls within the menstrual and proliferative phases. Further studies are recommended to replicate these findings and better characterize the genetic and physiological mechanism of CD200 in endometriosis progression, to validate its use as a diagnostic marker.

Course Code
HTHSCI 4A15
Abstract Title
Improving Family Planning & Reproductive Care Outcomes For Women in Pakistan

Author(s) – Haroon Abdullah, Jan Rukanuddin Rafat, Kaufman Karyn, Hutton Eileen K

Abstract Description
Every year in Pakistan, a country of more than 200 million people, there are 4 million unintended pregnancies of which 25% end in induced abortion. 50% of these abortions are performed by midlevel providers with limited training. Such unsafe abortions partly contribute to 12% of maternal deaths. Some reasons behind the high number of abortions include a low contraceptive prevalence rate (41%), abortion stigma and negative healthcare provider attitudes.

To help mitigate these unfortunate statistics and address provider attitudes, an eBook targeted towards midwives has been proposed. This knowledge translation-based project is a collaboration between McMaster University in Canada and the National University of Medical Sciences in Pakistan and is funded by Grand Challenges Canada. This eBook will include information pertinent to family planning methods, post-abortion care, and counseling approaches. It will include interactive features such as audiovisual features and built-self testing and will be written in English and Urdu. The ultimate goal of the eBook is to enhance midwifery education and training using a curriculum that considers the norms and cultural practices of the country.

Once the eBook is completed, it will be tested at 2 sites in Pakistan. Materials from the eBook will be implemented as part of the core curriculum for midwifery students in the community. The eBook will be evaluated for effectiveness with the intended audience using quantitative and qualitative approaches to determine the impact on attitudes and actual practice. These evaluations will play a role in adjusting materials for future editions of the eBook.
Abstract Title
McMaster Paediatric Eye Research Group (McPERG): The Eye Examination Mobile Assessment Clinic (EYE-MAC) Project - An Investigation on the Feasibility and Precision of a Novel Screening Program

Author(s) – Harrison Ava, Maqsood Asma, Stocks Emilyanne, Su Raymond, Hua Chia (Emily) Yang, Fleming Natalie, Sabri Kourosh

Abstract description
The Eye Examination Mobile Assessment Clinic (EYE-MAC) project investigates the feasibility and precision of a novel vision screening program conducted by the McMaster Paediatric Eye Research Group (McPERG). EYE-MAC builds upon previous studies conducted by the McPERG. This year, EYE-MAC has screened 620 elementary school children from within the Hamilton-Wentworth Catholic District School Board (HWCDSB). The objectives of EYE-MAC project aims to train non-eye care professionals through a multi-step educational program allowing them to assess important visual health indicators including visual acuity and stereoacuity. Children found to have vision problems will be connected with optometrists for timely treatment. The EYE-MAC project utilizes both theoretical and practical elements to train McMaster students to conduct vision screenings. Students test visual acuity using the M&S Smart System including Snellen and Lea chart, and perform stereoacuity tests using the Randot Stereotest Booklet. Implementation of the EYE-MAC project can be influenced by several different factors such as facilitation through the addition of mandatory standardized vision screening modules and can be impeded due to unexpected school closures. Going forth, the team members will continue vision screenings in all registered schools and relay results to parents and optometrists. Analysis of the data will be conducted to assess the accuracy of volunteer vision screeners and the effectiveness of vision screening in schools in order to facilitate implementation across Ontario.

Course Code
HTHSCI 3H06
Abstract Title
Reporting Outcomes and Outcome Measures in Open Rhinoplasty: A Systematic Review

Author(s) – Hassan Yusuf, Leveille Cameron F, Santos Jenny, Thoma Achilleas, McRae Mark H, McRae C.

Abstract description
Not available

Course Code
HTHSCI 4B06
Abstract Title
Evaluating the YWCA STEM Girls' Club

Author(s) – Hicks Rebecca, Heba Maryam, Secord Margaret

Abstract description
Women are underrepresented in the science, technology, engineering, and math (STEM) fields. In fact, while 66% of non-STEM university graduates are women, only 39% of STEM university graduates are women. Thus, the YWCA of Hamilton created the STEM Girls program to give girls in grades six through eight learning opportunities in STEM. The overall goal of STEM Girls is to encourage the participants to pursue goals in the STEM fields in high school and beyond. This project is a program review of the STEM Girls program. This project will collect feedback from the participants’ parents, developers, and community stakeholders through interviews and surveys; feedback from the girls in the program will be collected through the method of photovoice. To date, the student researchers have been attending the STEM Girls meetings to build a relationship with the participants to help facilitate the collection of more meaningful data. Moving forward, feedback of the program will be collected and analyzed from the participants, participants’ parents, developers, and community stakeholders.
**Abstract Title**
Size Matters? Evaluating the effect of size on anatomy learning

**Author(s)** – Hildebrand Alexandra, Xie Jim, Yang Jack, Brewer-Deluce Danielle, Fenesi Barbara, Wainman Bruce

**Abstract description**

**Introduction:** Until recently, the size of an anatomical structure for learning was simply its natural size. Now, with increasing accessibility to scanner technology for model making, and 3D printing and x-reality to display them, an accurate model of virtually any size can be produced. But the question remains, what is the best size for learning?

**Methods:** To investigate the effect of object size on learning, 3D models of a human thoracic vertebra and a human hemipelvis were printed from surface scans of bones at 50%, 100%, and 400% scale. Participants (n=120) were asked to learn nominal anatomy from each model of the same size.

**Results:** The effect of scaled size on learning varied between the vertebra and hemipelvis models. For vertebra anatomy, larger scaled size led to better performance than smaller size (p=0.008). Specifically, the 400% vertebra model lead to better test performance than the 100% model (p=0.042) and 50% model (p=0.001). For hemipelvis anatomy, no significant differences were found between groups. In terms of the actual dimensional size, larger size led to better test performance up to a certain point (p=0.001). Specifically, the 400% vertebra resulted in the highest test scores, though not all between-group differences were significant; the 100% hemipelvis, 400% vertebra, and 400% hemipelvis lead to better test scores than the 50% vertebra (p=0.006, 0.002, and 0.040, respectively).

**Conclusions:** This study has shown that model size for the smaller of the specimens has an impact on nominal anatomy learning which is not present for larger bones. Further research with a greater variation of size and testing methods is needed in order to elucidate the full effect of model size on learning.
Abstract Title
Fortified Foods and Vitamin D Deficiency: Evaluation of the outcomes of mandatory food fortification in Canada using radiographic evidence

Author(s) – Hildebrand Alexandra, Brickley Megan

Abstract description
Vitamin D is a prohormone required for the maintenance of blood calcium and phosphate levels, which are important for mineralization of bone and dentition, muscle contraction, and other cellular processes that are still being elucidated. It can be gained through synthesis in the skin from UVB radiation exposure, or obtained through the diet from foods such as oily fish and animal meats. Therefore, geographical location on the earth’s surface, as well as a multitude of biological, biocultural and social factors, affect an individual’s vitamin D status. When these factors create less than ideal conditions for adequate vitamin D synthesis in the skin or gained through diet, vitamin D deficiency can result, manifesting as rickets in children, and osteomalacia in both children and adults. These are diseases characterized by improper mineralization during growth and development of bone and teeth, resulting in characteristic skeletal lesions along with other changes. Recently, vitamin D deficiency has resurfaced as a public health concern worldwide. This is also the case in Canada, even though mandatory food fortification policies have existed since the introduction of mandatory food fortification of milk and margarine with vitamin D in 1974. The aim of this thesis is to apply the evaluation of bitewing radiographs to investigate the outcomes of mandatory food fortification in Canada in relation to the detection of vitamin D deficiency through pulp chamber morphology.
Abstract Title
The impact of environmental cadmium exposure on type 2 diabetes risk: An overview of systematic reviews

Author(s) – Hildebrand Julia, Thakar Swarni, Banfield Laura, Thabane Lehana, Macri Joseph, Hill Stephen, Watts Tonya-Leah, Samaan M. Constantine

Abstract description
Type 2 Diabetes Mellitus (T2DM) is a worldwide epidemic, and while its etiology is ill-defined, the role of environmental contaminant exposure in T2DM pathogenesis is of increasing importance. However, the evidence presented in systematic reviews on the relationship between cadmium exposure and T2DM development remains inconsistent. This overview aimed to assess existing evidence from systematic reviews linking cadmium exposure with T2DM and other metabolic morbidities in humans.

Methods: Searches were conducted in Medline, Embase, Web of Science, GEOBASE, BIOSIS Previews, and Cochrane Database of Systematic Reviews. Two reviewers independently completed screening, data abstraction, risk of bias evaluation, and quality assessment. The primary outcome was the association between cadmium exposure and T2DM prevalence. Secondary outcomes of interest included prediabetes, obesity, dyslipidemia, hypertension, and non-alcoholic fatty liver disease. A meta-analysis was performed using a random effects model.

Results: A total of 3 systematic reviews were included in this overview. The pooled OR for the association between urinary cadmium and diabetes risk was 1.11 (95% CI 0.99, 1.26; I squared = 65%), and 1.29 (95% CI 0.95, 1.75; I squared = 67%) for blood cadmium. Quality assessment showed that included systematic reviews were of low quality.

Discussion: Meta-analysis results suggested that cadmium exposure, as measured through urinary and blood cadmium levels, might be associated with diabetes risk, however these results were unsignificant. Overall, there is a lack of high quality systematic reviews that assess this relationship, or that assess related metabolic outcomes. Higher quality syntheses could be useful in confirming these findings.
Abstract Title
The Tin Can Telephone: A literature review exploring interventions to improve the state of family-staff communication in long term care

Author(s) – Holland Charmaine, McAiney Carrie

Abstract description
In long-term care settings, it is important that communication between staff and a resident’s family is effective to ensure quality resident care. However, the literature has identified a disparity between ideal and current staff-family communication. This literature review aimed to identify current interventions and strategies which address these communication gaps. An additional goal was to utilize the knowledge gained from the literature in order to inform a Dedicated Staffing Model: an ongoing intervention also aiming to enhance family-staff communication through consistent staffing assignment.

Resulting interventions were categorized into two types of support: administrative and educational. Administrative supports included interventions which provided managerial support during joint meetings between LTC staff and family, as well as interventions which focused on providing consistent resident assignment and shifts to nursing staff. Educational supports were further categorized into direct and indirect support. While direct approaches focused on informing family or staff on effective communication techniques, indirect approaches aimed to improve care-related knowledge, in turn increasing staff’s confidence and ability to communicate with family. Direct educational supports included provision of workshops for staff and family on effective communication strategies and conflict resolution. Indirect approaches included workshops and booklets to inform staff of care-related questions that family may raise. Findings suggest that both administrative and educational supports should be implemented to achieve greater improvements. Additionally, it is recommended that both staff and family should be targeted in future educational interventions aiming to improve family-staff communication. These considerations may be useful in informing the ongoing Dedicated Staffing Model in LTC.
Abstract Title
Design and Rationale of the Ross for Valve replacement in AduLts (ReViwAL) RCT

Author(s) – Hronyecz H, Belley-Côté I, Pettit S, Brady K, El-Hamamsy, Whitlock R.

Abstract description
Background: Even with best clinical practices, patients undergoing prosthetic aortic valve replacement (AVR) retain elevated rates of mortality. In non-elderly adult patients, replacement of the aortic valve with a mechanical prosthesis halves survival compared to age-matched controls. Mechanical valves confer the majority of their risk and negative effect on quality of life through prosthesis thrombogenicity, which necessitates lifelong anticoagulation. Bioprosthetic valves reduce thromboembolic and bleeding issues, but at the cost of limited prosthesis durability and similar reduction in survival. The Ross procedure aims to optimize hemodynamics and improve valve durability while lowering thrombogenicity and avoiding anticoagulation.

Study Design: a 3-year, expertise-based pilot trial of the Ross procedure versus conventional AVR in 7 centres in Canada and abroad.

Pilot Objectives: 1) To evaluate the feasibility of a definitive trial of the Ross procedure by assessing the capacity to enroll a mean of 6 patients per centre per year, 2) To validate the assumption of greater than 90% compliance with allocation, and 3) To validate the proportion of mechanical versus biologic valves in the conventional arm.

Methods: Feasibility will be evaluated using the incidence of survival free of valve-related life-threatening complications over the duration of follow-up. Consenting patients 18-60 years undergoing a clinically indicated AVR will be randomized to the Ross procedure versus AVR with a prosthesis. If we demonstrate feasibility in this pilot phase, we will seek funds for the full trial and the pilot trial patients will be included in the full trial for analysis.
Abstract Title
Achieving continuity of care for people at the time of release from the Hamilton-Wentworth Detention Centre: Barriers and opportunities

Author(s) – Hu Catherine, Jurgutis Jessica, Kouyoumdjian Fiona

Abstract description
Background: People who experience incarceration face unique health-related challenges after release from custody as they transition themselves and their healthcare back into the community. At the Hamilton-Wentworth Detention Centre (HWDC), one-third of people in custody lack a primary care provider outside the jail. Purpose: To better understand health-related needs, challenges, and desires after release from the HWDC, and to inform development of a pilot program linking people in the HWDC to primary care practices in the Hamilton community. Methods: The population of this qualitative study was adults released from the HWDC in the past year. Three focus groups (total n=18) were held at the Canadian Mental Health Association, Mission Services, and Good Shepherd Men’s Shelter. Discussions were audio-recorded, transcribed, and coded using NVivo. Preliminary Results: Experiences in custody strongly shaped people’s health and perspectives on health post-release; participants often remarked how much better healthcare in the community was compared to in jail. After release, common challenges included complex health concerns (e.g. substance use, pain management, mental health); disruptions to usual care from time in custody (e.g. medication changes); and non-health concerns (e.g. housing, employment). Barriers to success included stigma/discrimination due to criminal record, lack of a family doctor in the community, and lack of knowledge. Facilitators included support from family and friends and access to health and social services. Conclusion: People’s health-related experiences after release from the HWDC are diverse and complex. Our findings indicate promising opportunities to improve continuity of care and support overall health after release from custody.

Course Code
HTHSCI 4A09
Abstract Title
Expression of Monoclonal IgE SPE-7 Antibody for the Experimentation of Synthetically Modified Labels to Redirect Immunological Antibody Responses

Author(s) – Huang Eileen, Kapcan Eden, MacDonald Brady, Zeng Peter, Rullo Anthony

Abstract description
As key players in the immune system, antibodies are often used in clinical applications as immunotherapeutic agents against cancer 1. Monoclonal antibody (mAb) based therapeutics are currently used to trigger immune-mediated cytotoxicity, including antibody-dependent cellular cytotoxicity (ADCC) and phagocytosis (ADCP) 2. However, the ability of mAbs to induce a response is limited by the Fc region compatibility with immune cell surface receptors, requirement for high dose administration, and high cost of manufacturing 3. To circumvent such limitations, chemically modified molecules have been designed as an alternative to mAb immunotherapy 1. Current research investigates the potential use of covalent dimerizers (CDs), small molecules containing a serum antibody recruiting domain (ARD) an antibody anchoring domain that permanently links the CD to the target antibody, and a cancer cell binding domain (CBD), as potential immunotherapeutic reagents against target cells. In kinetic and proteomic studies validating CD anchoring to serum antibodies, the use of purified model serum antibodies produced in high mg quantities with defined CD binding sites is advantageous over polyclonal serum antibodies naturally present at low ug quantities that also contain heterogenic CD binding sites. For these purposes, sequence and structurally defined monoclonal anti-dinitrophenyl IgG antibodies, that bind the di-nitrophenyl derived ARD of CDs were engineered to model human serum endogenous anti-DNP IgG. These antibodies were produced through plasmid recombination of light chain (pFUSE2ss-CLIg-mk) and heavy chain (pFUSEss-CHIg-mG1) vectors to anti-DNP IgE SPE-7 Fab domain variable inserts.

Course Code
HTHSCI 3H06
Abstract Title
Are Simulation Learning Objectives Educationally Sound? A Single-Centre Cross-Sectional Study

Author(s) – Hui Madeleine, Mansoor Muqtasid, Sibbald Matthew

Abstract description

Background: Accreditation standards of simulation stress the importance of educationally sound learning objectives. We aimed to assess whether learning objectives adhered to theoretical frameworks outlined by accreditation standards, lending themselves to maximal learning outcomes.

Method: A retrospective study was conducted at the Centre for Simulation-Based Learning at McMaster University. Raters coded 848 faculty-designed learning objectives from 722 sessions based on Bloom’s Taxonomy, SMART (Specific, Measurable, Attainable, Realistic and Timely) criteria, and the presence of inappropriate verbs. Learning objective categorization was compared with student evaluations.

Results: Using Bloom’s Taxonomy, learning objectives were mostly focused on application 53%, followed by smaller percentages focused on knowledge 21.4% and comprehension 12.2%. Few learning objectives focused on higher levels of analysis 7.2%, synthesis 2.3%, and evaluation 3.7%. By SMART criteria, learning objectives were 49.6% specific, 60.8% measurable, 88.8% attainable, 85.0% realistic, and 9.1% timely. Approximately 1 in 5 objectives used inappropriate verbs. No correlations were observed between categorization by Bloom’s Taxonomy or inappropriate verbs to student rating. However, those containing specific, attainable, and timely goals were associated with lower levels of perceived achievement by students.

Conclusions: There is a disconnect between simulation accreditation standards and current practices. Most objectives were classified at lower stages of Bloom’s Taxonomy, though the majority followed SMART guidelines, with exception of mentioning a time frame. A significant minority of learning objectives contained inappropriate verbs. Given the costs associated with simulation-based education, educators should focus simulation learning objectives on higher levels of Bloom’s Taxonomy and include references to time frames.

Course Code
HTHSCI 4A12
Abstract Title
Atosiban Defeats Action of Neuroactive Bacteria Lactobacillus rhamnosus

Author(s) – Hwang Mark, West Christine, Kunze Wolfgang A.

Abstract description
Neuroactive commensal bacteria acutely affect gastrointestinal motility. A strain of probiotic bacteria *Lactobacillus rhamnosus* (JB-1) has been reported to reduce velocity of colonic propagating contractile clusters (PCCs) *ex vivo*. However, the exact mechanism in which these bacteria achieve this effect is largely unknown. As oxytocin and oxytocin receptors are abundantly expressed in human and mice enteric nervous systems, and as oxytocin signalling regulates gastrointestinal motility, we have hypothesized that JB-1 exerts its effects in decreasing colonic motility through oxytocinergic signalling. We generated spatiotemporal maps of colon segments before and after intraluminal treatment of JB-1 and/or serosal application of atosiban (an oxytocin receptor antagonist). We have found that treatment with JB-1 decreased colonic PCC velocity (p=0.03342), but not frequency (p=0.7969). Atosiban alone decreased PCC frequency (p=0.005907) but not velocity (p=0.2952). Blockade of endogenous oxytocin with atosiban was sufficient to eliminate the effect of JB-1 in reducing PCC velocity. Our results suggest that JB-1 may exert its effects on gut motility by modulating oxytocin signalling, and that oxytocin may be a key molecule in treating gastrointestinal dysmotility. Further research is needed to elucidate the exact role of oxytocin in the probiotic effects of JB-1.
Abstract Title
Assessing the Usability and User Experience of Canadian Bleeding Disorder Registries CBDR and MyCBDR.

Author(s) – Jin Yungchan, Lane Shannon, Almonte Theresa, Decker Kay, Iorio Alfonso, Keepanaseril Arun, Heddle Nancy

Abstract description
Introduction
The Krever Inquiry carried out in the mid 20th century to address a sudden crisis involving the contamination of transfused blood with HIV and Hepatitis C elicited a need for a system for tracking blood products. The first system, called CHARMS, was developed across Canada in 2000. In 2015, a new system, modeled after the Australian Bleeding Disorder Registry prototype, called CBDR and MyCBDR began to be implemented in Canada. The purpose of this study is to identify any usability and user experience factors (both positive and negative) in the adoption of the new electronic health systems CBDR and MyCBDR for the tracking of blood products.

Methods
In order to analyze the usability of CBDR and MyCBDR systems, the study recruited two groups of participants: 1) Hemophilia Treatment Centre (HTC) staff and 2) Person with Hemophilia (PWH), caregivers, and parents/guardians of PWH. At two time points (when the participants had no previous use of the system and three months after), WebEx Think Aloud and Interviews methods were utilized to elicit the participants' feedback on the two systems and subsequently comparative analysis was utilized to compare and contrast the results. In addition, the System Usability Scale (SUS) was implemented to measure the participants' subjective perceptions of system usability and analyzed via a paired t test.

Results
Analysis is still ongoing and full results are not available.

Conclusion
For future steps, a complete analysis of the data will be performed prior to publishing the findings in a peer-reviewed journal.

Course Code
HTHSCI 4A09
**Abstract Title**
Nutritional deficiencies are frequent in celiac patients on a gluten-free diet, regardless of the duration and compliance of the diet.

**Author(s)** – Jivraj A, Armstrong D, Bercik P, Collins S, Connan V, Verdu EF, Pinto Sanchez MI.

**Abstract description**

**Introduction:** The only treatment for celiac disease (CD) is a strict gluten-free diet (GFD). CD is associated with several nutritional deficiencies. The magnitude of these deficiencies in treated CD and how this is influenced by the duration and compliance of the GFD is unclear. **Objective:** To evaluate the presence of nutritional deficiencies in celiac patients on short term(<2yrs) vs. long-term(>2yrs) GFD, and in those strictly vs. fairly compliant with the diet.

**Methods:** We included consecutive biopsy-proven CD patients attending the McMaster Adult Celiac Clinic. At enrolment, GFD adherence was measured using the validated Celiac Dietary Adherence Test (CDAT) and by anti-tissue transglutaminase antibody IgA (tTG IgA) levels. Nutrient levels were measured in blood samples collected at enrolment. Categorical data was expressed as a proportion and SPSS was used for statistical analysis.

**Results:** 32 CD patients, following a GFD for an average of 4 years, were included. GFD compliance was good or excellent for 87% of patients. Normal tTG IgA was found in 80.7% of patients. The most common nutritional abnormalities were deficiencies in zinc, vitamin D, and copper. There was no correlation between nutrients and tTG values. There were no differences in nutritional deficiencies between patients with short and long-term duration of GFD, nor between those strictly compliant with GFD compared to those fairly compliant (p>0.05).

**Conclusion:** Nutritional deficiencies are frequent in celiac patients on a GFD regardless of dietary compliance or duration. Our preliminary results suggest that nutritional deficiencies may be due to GFD nutritional inadequacy rather than disease activity.

**Course Code**
HTHSCI 3H06
Abstract Title
Applied Theatre within Undergraduate Medical Education: A Systematic Review

Author(s) – Johnston Bronte, Jafine Hartley

Abstract description
Applied theatre has been integrated within various undergraduate medical education programs within North America to improve students’ clinical skills and empathetic behaviours in future physicians. For the purposes of this paper, applied theatre is defined as the use of drama skills within educational practice. Currently, several medical schools across North America incorporate a variation of applied theatre within their curriculums. However, there is presently no compilation of current publications regarding applied theatre and undergraduate medical education; this information would be valuable to further understand the benefits of the intersections of drama and health education.

Twelve publications were obtained from online databases including: Pubmed, OVID, Web of Science, and ERIC; a specific keyword search was employed: “medical education” and “theatre (or applied drama or theater), and “North America”, and “drama”, and "medical students.” Qualitative analysis was performed by coding and recoding the data through NVivo 12 software. Recoding words included: communication (collaborative relationships, non-verbal communication skills, verbal communication skills), education (curriculum, discussion, evaluation, experiential education, feedback, reflection, simulation), and personal development (compassion, empathy, enjoyment, perspective, realism, stress relief, wellbeing).

Thematic analysis demonstrated the positive benefits of applied drama with improving undergraduate medical students’ communication skills, education, and personal development. Additionally, the results demonstrated how applied theatre activities overlap with the CanMEDS framework 0highlighting their merit within medical education. This systematic review provides insight into the importance of applied theatre within undergraduate medicine and how it should be further incorporated throughout the curriculum.
Abstract Title
Examining Caregiver Burden in First Episode Psychosis

Author(s) – Jomy Jane, Gardizi Elmar

Abstract description
Introduction: Caregivers play a critical role in supporting persons with psychosis; however, they are at high risk for significant psychological distress. Most studies have focused on the impact of caregiving in chronic patient samples, while overlooking burden earlier in the course of illness. Consequently, the purpose of the current study was to: (1) examine the rate of caregiver burden in carers of first episode psychosis patients and to compare the results to chronic cases and (2) examine patient characteristics that are predictive of caregiver burden in first episode psychosis.

Methods: Data from 44 caregivers enrolled in the Cleghorn Early Intervention Clinic at St. Joseph's Healthcare Hamilton was used. Caregiver burden was measured using the Experience of Caregiving Inventory (ECI). Descriptive statistics were used to examine rates of caregiver burden while multiple linear regression was used to examine the influence of patient characteristics (age, symptom severity, disability, and insight) on burden.

Results: The mean ECI score for our sample was 94.2 (SD = 36.1), which was higher than scores reported in caregivers of patients with chronic disorders. The regression model was significant $F(4, 35) = 3.78, p < .10$ and yielded an $R^2$ value of .301.

Discussion: A first episode of psychosis is an unfamiliar experience therefore, patients have lower levels of insight compared to chronic cases. Low insight can lead to poor adherence to medication, leading to an increased risk of relapse and higher symptom severity. Therefore, early evidence-based interventions can be effective to improve patient and caregiver outcomes.
Abstract Title
Development of a Urea Assay for Diagnosis of Type 2A von Willebrand Disease: A Phage Display Approach

Author(s) – Kalim Ayesha, Kretz Colin

Abstract description
Abstract Description: von Willebrand Disease (VWD) is the most common inherited bleeding disorder, affecting up to 1% of the world’s population. It is caused by either a qualitative or quantitative deficiency of von Willebrand Factor (VWF) in the bloodstream, a protein that is important in regulating hemostasis. VWD is suspected when a patient presents with a personal and/or family history of mucosa-associated bleeding, and diagnosis is done after a series of laboratory tests that assess VWF-antigen levels, VWF platelet-binding activity, and characterise the disease subtype. Type 2A VWD occurs when mutations in VWF cause a deficiency in high-molecular weight VWF multimers or increase VWF’s susceptibility to cleavage, leading to decreased platelet adhesion. VWF is cleaved by the metalloprotease, ADAMTS13; however, proteolysis only occurs under high fluid shear stress conditions. The objective of this project was to develop an assay for diagnosis of Type 2A VWD, which would allow for quicker time to diagnosis. Phage display was used to exhibit the relevant VWF domains: VWF73 and A2. Urea was used to replicate the fluid shear stress conditions in vitro, as it has demonstrated positive results in a previous study. The peptide-displaying bacteriophage and ADAMTS13 were incubated in the presence of urea for the proteolytic reaction to occur. Results demonstrated that urea is a viable method of mimicking fluid shear forces, as cleavage of the VWF domains occurred. Further investigation is required to determine optimal enzyme and urea concentrations, and to increase the bacteriophage concentration for the assay to produce more reliable results.
Abstract Title
Cord blood dendritic cell gene expression: atopic risk factors at birth

Author(s) – Kao Yun-ya, Heroux Delia, Akhabir Loubna, Denburg Judah A.

Abstract description
Allergic diseases are the first non-communicable chronic disease to manifest early in life. Early exposure to the environment may alter the risk of allergic sensitization in children, and therefore, investigating early environmental influences is crucial in understanding the etiology of allergic diseases. Cord blood (CB) progenitor cells may provide valuable insight into early life immune cell development that may skew the immune balance towards a Th2 allergic phenotype. Dendritic cells (DCs) are vital in mounting an efficient Th2 response. However, they are difficult to study in cord blood due to their low numbers of DCs that can be obtained ex vivo. The overall objective of this thesis was to investigate 1) whether the CB DC mRNA expression of innate receptors is comparable to their cultured counterparts 2) to compare the gene expression profiles of CBDCs in children based on atopic risk factors, including history of maternal atopy and history of paternal atopy, as well as exposure to smoke during pregnancy. An optimized DC culture protocol was used to induce DC differentiation from CB HPC. CB samples were obtained, cultured, enriched, and mRNA expression was analyzed using qPCR. Data showed no significant difference in mRNA expression in selected genes between in vitro and freshly isolated DCs. The expression of IL17RB, IL1RL1, and FcαRI trended towards a difference for maternal atopy status as well as between non-exposed mothers and exposed mothers. However, the finding was not significant. A greater number of subjects is needed to improve the statistical power of the study.

Course Code
HTHSCI 4A12
Abstract Title
A Systematic Review Comparing the Use of Negative-Pressure Wound Therapy to Standard Gauze Dressings in High Energy or Open Fracture Patients

Author(s) – Kapoor Raveena, Rubinger Luc, Johal Herman

Abstract description
In the case of open fractures, traditionally a sterile saline gauze dressing or an antibiotic cement bead pouch is applied. However, advancements in negative pressure wound therapy (NPWT) have led to a shift in practices, where NPWT takes on a prominent role in the treating open fractures. Evidence-based literature comparing the efficacy of NPWT to standard gauze dressings for the management of fractures is currently limited. Therefore, this systematic review investigates the overall efficacy of NPWT in comparison to standard gauze dressings in preventing complications requiring readmission (primarily infection) in open fracture patients. Secondary outcomes assessed included length of stay, number of dressing changes and overall functionality. Using inclusion criteria, a total of thirteen randomized controlled trials (RCTs) and non-RCTs were included in this review. In all studies NPWT proved to be as effective or more effective than standard gauze dressings in treating open fracture wounds. Using the Cochrane Risk of Bias tool and the ROBINS-i tool, all studies with the exception of two were concluded to have high risk of bias, as high risk of bias was assessed in at least one domain using the tool. Overall, tentative evidence demonstrates that NPWT increases efficacy in treating open fracture wounds. Nonetheless, additional high-quality RCTs in this field should be conducted to reach more conclusive results.

Course Code
HTHSCI 3H03
**Abstract Title**
Examining Changes in Macular Thickness in Pregnant Persons with Type 1 and Type 2 Diabetes.

**Author(s)** – Kherani Imaan, Platt Alex, Fielden Michael

**Abstract description**
Diabetes affects the retina microvasculature which can have devastating ocular consequences including vision loss resulting from neovascularization and/or macular edema. Recent literature has identified pregnancy as a major risk factor in the progression of diabetic ocular changes. However, an understanding of the natural history of diabetic macular edema in pregnancy and postpartum is not well known. As noted by case reports, although larger scale clinical studies are missing in literature, diabetic macular edema seems to regress postpartum as blood pressure decreases and hormonal levels revert close to pre-pregnancy levels. Elucidating the natural history of macular edema during pregnancy and postpartum would aid in management of diabetic macular edema providing imperative information regarding appropriate delivery time and retinal therapy in pregnancy. Using optical coherence scan technology, central foveal macular thickness and inner ring macular thickness of pregnant persons with type 1 diabetes mellitus (T1DM), and type 2 diabetes mellitus (T2DM) were analyzed pre-pregnancy, during 1st trimester, 2nd trimester, 3rd trimester, and finally, post-partum (up to 10 months). Statistical analysis revealed macular thickness did appear to change during pregnancy in T1DM and T2DM, with most distinct occurring in the 2nd and 3rd trimester. Thickness levels tended to revert towards pre-pregnancy levels as time progressed postpartum. Differences in mean thickness were noted between T1DM and T2DM cohorts in distinct time periods within our analysis, with T1DM macular measurements being slightly thicker. Further mixed-modelling analysis to account for confounders may encourage considerations and guidelines for treatments related to pregnancy induced diabetic macular edema.
**Abstract Title:** Conformational Dynamics and Binding Kinetics in DNA-Protein Interactions

**Author(s):** Khondker Adree, Fradin Cecile

**Abstract Description:**
The functional properties of biological molecules, such as DNA, are widely determined by their structure and dynamics. This is especially important in determining protein-DNA interactions which enable fundamental processes such as transcription, gene regulation, and therapeutic efficacy. Here, we study the dynamics and conformations in DNA-protein interactions using fluorescence correlation spectroscopy (FCS) by modeling DNA as a semi-flexible polymer in solution. Our results suggest that the mobility of DNA plasmids is inversely proportional to the length of the plasmid. Furthermore, the binding of EcoRI endonucleases rigidifies DNA by decreasing the flexibility and decreasing the decay constant, whereas non-binding endonuclease SpeI shows minimal effect on DNA dynamics. By determining the diffusion of plasmids in the presence of endonucleases over time, the binding kinetics are also determined. Together, these results provide new and highly sensitive insights into DNA-protein interactions in solution.

**Course Code**
HTHSCI 4A09
Abstract Title
Role of Mast Cells in Modulating Normal Baseline Gut Motility

Author(s) – Kim Annie, Imtiaz Karamat Mohammed, Forsythe Paul

Abstract description
Mast cells are key players in the immune system as they play an important role in allergic reactions and infections. They are found adjacent to neurons in the gut, making their location an asset when mediating the communication between the nervous system and the rest of the body. We investigated if mast cells can modulate baseline gut motility by comparing the motility of mast cell deficient mice with healthy controls and deficient mice that have undergone mast cell reconstitution. We found that certain parameters of baseline gut motility are altered in mast cell deficient mice and returned to normal in reconstituted mice. We also confirmed that whole bone marrow injections are able to restore mast cell levels in mast cell deficient mice, and show that toluidine blue staining is an effective way to identify mast cells. These results suggest that mast cells can control baseline gut motility.
**Abstract Title**
Expanding the first line of defence: Analyzing Hamilton Fire Department Incident Data and Evaluating Public Education Programs

**Author(s)** – Kim Judy, Etherington Robert, Al-Saqqar Shahad

**Abstract description**

**Problem:** In 2018, the Hamilton Fire Department (HFD) responded to 11,203 non-medical incidents, averaging nearly 30 non-medical responses per day; however, maintaining public safety through incident response is the third line of defence in the HFD’s three-line model. The first is public education and awareness.

**Challenge:** How can the HFD enhance public safety through targeted, risk-based public education programming?

**Goal:** The goal for this project is two-fold: 1) Gaining a greater understanding of non-medical incidents and their corresponding demographics; 2) promoting a safe neighbourhood

**Progress:** An initial meeting with the community partner allowed for student researchers to gain a full understanding of their needs and goals. Secondly, a research question was formulated and reviewed to ensure the scope met the priorities of the community partner.

**Next Steps:** Over the next several months, the nearly 11,000 non-medical incidents requiring response from the HFD will be analyzed, with the goal of identifying and differentiating the geographic, demographic, and substantive loci of incidents; additionally, the HFD’s past public education and awareness initiatives will be evaluated for their effectiveness in terms of outcomes, as well as strengths and potential gaps.

**Course Code**
HTH SCI 4DE3
HTH SCI 4D09
Abstract Title
Evaluation of the Clinical Pharmacology and Toxicology (CPT) Content in the McMaster Medical School Curriculum

Author(s) – Kim Judy, Holbrook Anne M, Riggi Kaitlynn, Levine Mitch, McAssey Karen, Rudkowski Jill, Levinson Anthony J

Abstract description
Not available

Course Code
HTHSCI 3A15
Abstract Title
Exploring the mechanism behind how age impairs macrophage function in a TNF-dependent manner

Author(s) – Kim M.N., Ma D., Chon J., Loukov D., Bowdish D.M.

Abstract description
Not available
**Abstract Title**
Program Evaluation of a Mobile Developmental Outreach Clinic for Autism Spectrum Disorder

**Author(s)** – Kim Nicole, Sivapalan Shiv, Shanmugalingam Neshanth, Georgiades Stelios, Kata Anna

**Abstract description**
In the field of Autism Spectrum Disorder (ASD) and more broadly in child developmental health, an optimal outcome is defined as the best possible outcome considering a child’s history. It is widely known that an early diagnosis (before 3 years old) with timely interventions are important to guide a child with ASD toward their optimal outcomes.

However, Ontario is facing a wait time crisis. The average time to diagnosis is 31 weeks, and 23000 children are on the 2 year-long waitlist for post-diagnostic services. The recent changes to the Ontario Autism Program will render many families unable to afford the high costs of interventions for their children with ASD.

Within this wait time crisis, the South Asian Autism Awareness Centre (SAAAC) identified a key vulnerable population: there is often notable delay in diagnosing children with ASD from newcomer minority groups relative to non-minority groups as a result of knowledge, linguistic, and financial barriers, along with cultural factors.

Through the development and implementation of the “Mobile Developmental Outreach Clinic”, SAAAC aims to improve access to developmental health services for low-income and/or newcomer South Asian families, reduce wait times to ASD diagnosis and post-diagnostic services, and deliver culturally sensitive practices.

The M-DOC’s simplicity and developed protocol may make it feasibly translatable to other locations and minority populations across Canada.

My role has included preparing for and writing a goal-oriented program evaluation, finding implementation considerations, and generating descriptive statistics to report to Autism Speaks Canada, which provided this program with funding.

**Course Code**
HTHSCI 4C12
Abstract Title
Response Inhibition (RI) in Chronic Pain (CP): A Review

Author(s) – Klugsberg Jordana, Elik Nez

Abstract description
Chronic pain (CP) is recurrent or persistent pain lasting more than 3 months. Deficiencies in response inhibition (RI) exist in individuals with CP compared to healthy controls (HC), due to inhibitory deficits and shared RI-CP neural pathways. Inhibition refers to stopping pre-planned or ongoing responses that are excessive or inappropriate. Lower RI may explain executive function deficits in CP patients, however, effects may be reversible with redistribution of brain activation. The current study critically examines existing research on RI in CP, providing recommendations for future investigations and clinical care interventions. Only studies utilizing go/no-go (GNG) paradigm and stop-signal paradigm (SSP) were examined, as higher level cognitive processing is not required. No research exists on RI in pediatric CP. When compared to HC, CP patients have none to moderate RI impairments, and even in cases with no observable differences in RI, neuroimaging showed different regions of brain activation. To make accurate and meaningful conclusions, multimethod studies should include neuroimaging and both GNG and SSP. Future studies must control for medications, sleep, pain characteristics, CP type, and comorbid disorders (e.g. anxiety). Since neural pathways overlap, through RI we can gain insight into the expression of CP - changes in the brain and central nervous system. We propose that with more research, clinical care can be improved by creating an RI task in the form of a game or program, allowing inhibitory processing to become habitual or automatic, interrupting neuroplasticity – reversing and normalizing brain activation and improving symptoms of CP.

Course Code
HTHSCI 4C15
Abstract Title
Economic Value in Orthopedics: A Scoping Review

Author(s) – Koziarz Frank, Tsirulnikov Danielle, Johal Herman

Abstract description
The assessment of value in orthopaedics is a broad investigation often encompassing terms such as economic analysis, quality adjusted life years, patient reported outcomes, treatment options, among many more. There is increasing attention placed on the cost effectiveness of new medical interventions regarding the balance between patient outcome and quality of life.1 However, subjecting current orthopaedic practice under economic scrutiny is difficult to do due to the plethora of current established medical interventions, options, and policies.1 Patient treatment options in rheumatoid arthritis is greeted with a multitude of treatment options, leaving medical professionals in difficult circumstances on providing the optimal cost and utility analysis to each patient for a given intervention.2 Surgical interventions often encounter similar issues with cost effectiveness being a less valued factor in comparison to aesthetics for particular procedures.3 This scoping review aims to provide a holistic understanding of value in orthopaedics to provide clarity on the heterogeneous field that may otherwise not be capable of being precisely presented systematically. Due to the nature of orthopaedics being broad via multiple categorizations; a scoping review is warranted to collect a holistic perspective of value. A qualitative analysis of such has not been explored in the literature and therefore warrants investigation to inform both professional and non-experts entering the field on these important constituents in orthopaedic medicine.

Course Code
HTHSCI 4B06
Abstract Title
Management of Common Intestinal Parasites in Pregnancy: A Systematic Review

Author(s) – Kwan Jason, Sen Phuong Melissa, Lau Rachel, Khatib Aisha, Makhani Leila, Raheel Hira, Kopalakrishan Swana, Bhasker Shveta, Lecce Celine, Marks-Beaubrun Kimberley, Dwek Philip, Mishra Sharmistha, Boggild Andrea K

Abstract description
Parasitic infections in pregnancy necessitate consideration of numerous factors including potential maternal-to-child parasite transmission risk during pregnancy and delivery and potential anti-parasitic drug toxicity to the fetus and development of the newborn. We aim to map the available literature regarding the efficacy, safety, and tolerability of treatment of intestinal parasites in pregnancy, and synthesize the available literature on specific parasitic infections and anti-parasitic agents. 2479 articles were identified and 1774 articles were retrieved for title, abstract and full-text screening. Two independent reviewers with a tertiary arbitrator screened all systematic reviews, randomized controlled trials, cohort studies, smaller observational studies, case-control studies, case series, and case reports assessing or reporting the efficacy, safety, or tolerability of anti-parasitic drugs used in management of parasitic infections during pregnancy. Two independent reviewers extracted the data and assessed trial quality using the GRADE approach. Data were summarized using qualitative and quantitative measures for specific parasitic infections as well as efficacy and safety of anti-parasitic agents. Risk of bias for each study was determined. With increased international travel and migration of migrant and vulnerable populations, it can be expected that health practitioners will be faced with managing parasitic infections in pregnant patients. Currently, quality evidence supporting specific management strategies is limited. Synthesizing the current literature on anti-parasitic agents and treating parasitic infections in pregnancy can translate into multidisciplinary clinical recommendations for improved pregnancy care.
Abstract Title
Impact of ABO blood group on the development of venous thromboembolism in children: a systematic review

Author(s) – Lam Shin Cheung Jeffrey, Lam Shin Cheung Victor, Athale Uma

Abstract description
Background:
Venous thromboembolism (VTE) is a complication of normal blood clotting which may result in death. Studies have demonstrated that non-O blood group is a risk factor for VTE in adults, however few studies have confirmed these findings in pediatric populations. Hence, we performed a systematic review to determine whether children (0-18 y.o.) with non-O blood have an increased risk of developing VTE compared to those with O blood group.

Methods:
We searched Ovid Medline, Embase, PubMed, Cochrane, Web of Science, and CINAHL online databases from inception to December 2018 to find studies involving blood grouping and VTE. Data was collected regarding patients’ concurrent diseases, sex, age, ABO blood group, and incidence of VTE. A meta-analysis using the random effect model was performed in Microsoft Excel, and heterogeneity was assessed with Cochran’s Q test and I² value.

Results:
Among 1281 unique articles identified, 7 studies (3 conference abstracts, 4 peer-reviewed journal articles) involving 609 VTE cases were included in the final systematic review. All studies (2 case-control studies, 5 cohort studies) were conducted in Canadian centres. Six studies were eligible for the meta-analysis; all involved cancer patients only. Non-O blood group was found to be an independent risk factor for VTE (OR: 2.45, 95% CI: 1.48-3.42; p <0.005). Findings were similar across sensitivity analyses.

Conclusions:
This systematic review documents increased VTE risk in children with non-O blood group compared to those with O-blood group. Larger studies across different ethnic backgrounds and disease categories are needed to confirm these findings.

Course Code
HTHSCI 4A15
Abstract Title
Thera-band® Training for Age-Related Muscle Dysfunction: Preliminary Results

Author(s) – Lan Lucy, Nilsson Mats I., Hatcher Erin, Barnard Kristin, Hettinga Bart P., Bujak Adam L., May Linda, Nederveen Joshua P., Mikhail Andrew, Di Carlo Alessia, Hamilton Bethanie, Tarnopolsky Milla, Meeuwisse Soren, Waddington Emma, Tarnopolsky Mark A.

Abstract description
Introduction: Hallmarks of the aging process include loss of muscle mass, strength, and function (sarcopenia), which reduce quality of life and increase morbidity as well as mortality. Considering that up to 40% of individuals over the age of 60y exhibit age-related muscle dysfunction, there is a need for cost-effective interventions. There is strong evidence that resistance exercise training (RET) promotes muscle protein synthesis and attenuates the rate of muscle decline in elderly. The effects of milder forms of RET, such as Thera-band® training, have not been elucidated in this population to date. Benefits over traditional RET may include that it is low-cost, home-based (convenience), and safe, which may be more suitable for frail elderly.

Purpose: The aim of this study is to assess the effects of a 12-week Thera-band® training program on strength, muscle function, and muscle mass of males aged 65+.

Methods: Anthropometric outcomes, muscle function, and daily diet/physical activity were assessed at baseline and at 12-weeks (n=60).

Results: Although the number of subjects who have completed the full study is too low to draw definitive conclusions, our preliminary results indicate that appendicular skeletal muscle mass may be improved in old healthy males (O-CON; P<0.05), while 4MWT speed may be preferentially augmented in sarcopenic individuals (O-SARC; P<0.05). Maximal grip strength and other functional tests also show promising trends in O-CON and O-SARC.

Conclusion: We surmise that Thera-band® training may be beneficial for combatting age-related muscle dysfunction in male subjects.

Course Code
HTHSCI 3H06
Abstract Title
Disappearing liver metastases: investigation of the pathological response of colorectal cancer liver metastases patients to chemotherapy

Author(s) –Latchupatula L., Valencia M., Faisal R., Deepak D., Serrano P.

Abstract description
Background
Metastasis to the liver occurs in nearly 50% of colorectal cancer cases but only a small percentage of hepatic lesions are resectable, leaving patients to rely on other techniques such as chemotherapy. Used in the neo-adjuvant setting, chemotherapy in some patients have shrunk hepatic lesions to the extent that they are undetectable by diagnostic imaging. We propose to undertake a retrospective cohort study of patients with colorectal liver metastases (CRLM) who underwent chemotherapy to determine the incidence of disappearing liver metastases (DLM) as well as the recurrence of disease.

Methods
A retrospective review of all patients > 18 years of age with CRLM diagnosed between January 2009 to September 2016 was performed. Patients treated with neoadjuvant chemotherapy and considered for hepatectomy were included in this study. Demographics, chemotherapy, and diagnostic imaging details were collected to determine the local recurrence rate of liver tumours within 2 years of initial disappearance of metastases.

Results
From January 2009 to September 2016, there were 446 patients with a diagnosis of primary colorectal cancer who later developed metastases to the liver. 289 (64.8%) patients received chemotherapy, with a median of 8 cycles and a range of 1 to 92 cycles. DLM occurred in 43/289(14.9%) patients. Finally, 18/289 (6.23%) patients went on to develop recurrence of liver metastases within two years of the initial DLM.

Conclusion
The local recurrence rate of 6.23% obtained through our retrospective study suggests that a small proportion of patients with chemotherapy-induced DLM will develop recurrence within two years following disappearance.

Course Code
HTHSCI 4A09
**Abstract Title**
Using reprogramming to separate and study different clones of acute myeloid leukemia to accelerate therapeutic discovery

**Author(s)** – Leber Andrew, Golubeva Diana, Orlando Luca, Bhatia Mick

**Abstract description**
Cancer is a notoriously hard disease to model, with immortalized cell lines having low translational success rates and primary cells being hard to acquire and culture, as well as clonal indiscrimination in the sample. Taken together, this indicates a marked need for an improved cancer model with high rates of translational therapeutic success, clonal distinction, and strong controls. Induced pluripotent stem (iPS) cell clones of primary cancer can fill that need, offering a robust model for many aspects of the disease, including pathogenesis and drug screening, with unprecedented advantages to both. Though there are many challenges to reprogramming cancer cells, these can be mitigated using advanced reprogramming techniques.

Here, various aspects of iPS models of are investigated, particularly with regards to the unique advantage of primary sample derived iPS models of clonal distinction, and the consequential benefits to drug screen and ability to study tumorigenesis and the dynamics of relapse.

**Course Code**
HTHSCI 3H06
Abstract Title
A Scoping Review of Gender-related Bias and Discrimination in Medicine: A Preliminary Report

Author(s) – Lee Anna, Nguyen Laura, Kelecevic Julija

Abstract description
Despite the increased number of women in medicine over the last few decades, there is lack of research investigating the impact and significance of this change. A deeper investigation of the impact of gender in medicine is crucial to reduce any gender disparities that may be present. This study provides a first comprehensive assessment of the literature providing important insight into the complexities of issues surrounding feminism in medicine. We conducted a scoping review of the search engines, Web of Science, Cochrane, and Pubmed. All english articles published in between Jan. 1, 2012 and Nov. 13, 2019 on gender inequalities in medicine in Canada were included. From 1072 articles identified, data from 29 studies were extracted for qualitative analysis. A narrative synthesis of the literature was developed, following eight major themes: (1) workforce figures; (2) gender bias and discrimination; (3) leadership and academia; (4) mentorship and role models; (5) pregnancy, parenting, and childcare; (6) relationships; (7) work-life balance, and professional satisfaction; (8) patient/public preference; and retirement and financial planning. Our findings suggest that although the workforce figures have improved significantly, certain fields, such as surgery and academic medicine, still remain male dominated. In addition, there was a tendency to refrain from acknowledging that any sexism exists, however, studies show that covert discrimination still exists. The possible causes of gender inequity is complex and multifactorial, however, continued monitoring with dedicated efforts to change the workplace culture on both institutional and individual level will permit progress over time.
Abstract Title
Effect of Knocking out IL--15 and Reducing Bacterial Pathogen Burden on the Development of Atherosclerosis

Author(s) – Lee Anna, Trigatti Bernardo L

Abstract description
IL--15 is a pro-inflammatory cytokine shown to have a pivotal role in the survival and activation of certain lymphocytes, mainly natural killer, natural killer T, and cytotoxic CD8+ T cells. IL--15 has been found in human and murine atherosclerotic plaques. Pathogens have been reported to have a role in atherosclerosis. For instance, Helicobacter pylori has been detected in human carotid atherosclerotic plaques. To examine the role of IL--15 and the effect of pathogens on atherosclerosis, we exposed IL--15/ApoE deficient and IL--15 expressing ApoE deficient mice to an antibiotic treatment diet designed to eliminate Helicobacter spp. Genetic deletion of IL--15 led to a 70% reduction in male atherosclerotic plaque volume and 60% reduction in female ApoE--/--- mice under Helicobacter spp.+ conditions. Founders were put on the treatment diet until they were confirmed Helicobacter spp. free and were bred in a Helicobacter spp. free room to generate Helicobacter spp. free IL--15/ApoE and ApoE deficient mice. In female ApoE--/--- mice that were deficient in Helicobacter spp. and other pathogens, there was an 80% decrease in plaque volume compared to Helicobacter spp.+ ApoE--/--- mice. Deletion of IL--15 did not reduce atherosclerosis further in these mice. This study shows that 1) in the presence of common bacterial pathogens, IL--15 deletion protects against atherosclerosis and 2) rendering mice deficient in Helicobacter spp. and/or other pathogens dramatically reduces atherosclerosis development, while there was no further reduction due to IL--15 deletion. This suggests that targeting IL--15 and pathogen burden may represent effective approaches to limiting atherosclerosis development.
Abstract Title
The Pediatric Autism Research Collaborative Project: Addressing knowledge and collaboration gaps in Autism Spectrum Disorder research and practice

Author(s) – Lee Sandra, Kata Anna, Georgiades Stelio

Abstract description
Introduction: There is an emphasis on individualizing treatment within the pediatric Autism Spectrum Disorder (ASD) population which requires taking into consideration psychosocial and contextual factors of the child. These complex factors determine treatment effectiveness and appropriateness and should be considered further for research informing clinical practice. However, lack of collaboration between researchers and clinicians has compromised this sort of holistic data collection and subsequent data analysis. The Pediatric Autism Research Collaborative (PARC) Project is a feasibility project aiming to bridge these knowledge and collaboration gaps by implementing an ASD research protocol within clinical practice.

Methods: The research protocol was developed through a multi-stakeholder process; Parents, clinicians, and researchers considered information already being collected on patients and formulated the protocol to include PARC-specific questionnaires that would encompass additional social/contextual factors. The protocol is currently implemented at the Ron Joyce Children Health Center’s ASD Program (i.e. an outpatient ASD clinic), where newly diagnosed families entering the program are recruited.

Results: The project has shown strong response rates, affirming the protocol’s feasibility. To date, 94 families have been enrolled and 59 baseline questionnaire packages with high completion rates have been received.

Future Directions: The additional social/contextual information collected through the ASD protocol will be analyzed in meaningful ways to inform a child’s treatment and produce better outcomes for the child and their family. Further development and potential success of the ASD protocol has positive implications for the development of similar structured protocols in other areas of mental health services.

Course Code
HTHSCI 3H03
Abstract Title
Chronic Pain Patients' Experiences, Level of Compliance, and Common Complications During Opioid Tapering: A Pilot Qualitative Study Using Grounded Theory Methods

Author(s) – Leenus Alvin, Buckley Norm

Abstract description
Not available
Abstract Title
Design and Rationale of the Atrial Fibrillation Occurring Transiently with Stress (AFOTS) Incidence Study

Author(s) – Lengyel AP, Belley-Côté EP, Bhatnagar AK, Rochwerg B, Healey JS, McIntyre WF, Whitlock RP

Abstract description
Background: Atrial fibrillation (AF) is often detected for the first time in patients hospitalized for medical illness or following non-cardiovascular surgery. Atrial fibrillation occurring transiently with stress (AFOTS) describes this subset of AF, which may either be the result of a non-cardiac stressor, or of underlying paroxysmal AF that was not previously detected. Current literature largely disagrees on the true incidence of AFOTS, with estimates ranging from 1% to 44%—a disparity that is likely the result of differing detection strategies.

Methods: The prospective, multi-centre epidemiological AFOTS Incidence study will enroll 250 total participants admitted to intensive care units for medical illness and non-cardiac surgery. Participants will wear a 14-day ECG patch monitor following admission and will be followed for 30 days, or until discharge. The primary endpoint is patch monitor detection of AF lasting 30 seconds or more.

Results: We conducted a vanguard feasibility study, and 56 participants have completed participation. To date, the median duration of monitoring was seven days. AF was detected by the clinical team in 8 participants. We expect to complete this study in summer 2019.

Conclusions: The AFOTS Incidence study will employ a systematic and highly sensitive protocol for detecting AFOTS in medical illness and non-cardiac surgery ICU patients. This study will provide a reliable estimate of the true incidence of AFOTS in this population, addressing the discrepancy in existing literature and helping to inform clinical management.
Abstract Title
A Survey of Obesity and Sugar Intake in the Caribbean Region

Author(s) – Leung Gareth, Bocage Christine

Abstract description
Objective: The objective of this study was to understand the prevalence of overweight, obesity, and sugar intake the Caribbean region.

Design and Methods: Data was collected and analyzed from various online data sources including the World Health Organization (WHO) Global Nutrition Monitoring Framework, Centres for Disease Control and Prevention (CDC), Food and Agriculture Organization of the United Nations (FAO), and the World Bank.

Results: The highest prevalence of overweight was 35.8% in the Bahamas and lowest at 23.4% in Saint Lucia in 2016. The prevalence of overweight children age 0 to 59 months was highest at 12.2% in Barbados in 2012, and lowest at 3.6% in Haiti in 2012. The prevalence of obesity in age 5 to 19 was highest in the Bahamas (15.9% in men; 20.2% in women), lowest in Haiti (2.1% in men; 2.0% in women). All countries exceeded the sugar availability except Haiti; Trinidad and Tobago, as well as Barbados consumed over three times the recommended amount.

Conclusion: Additional data is required to fully understand the nutrition situation in the Caribbean region, as many Caribbean countries were missing nutritional data. In the future, it will be essential to monitor the impacts of obesity plans and policies to ensure that the Caribbean Cooperation in Health Phase IV (CCH-IV) and the Sustainable Development Goals (SDGs) are met. In summary, the rising rates of overweight and obesity, as well as the high sugar intake need to be addressed in the Caribbean region.
Abstract Title
Modelling the Placental Barrier in an In Vitro Co-Culture System: A Tool for Investigating Maternal-Fetal Molecular Transport

Author(s) – Li Edward W., Wong Michael, Selvaganapathy Ponnambalam R., Raha Sandeep

Abstract description
Background: Healthy fetal development is dependent on the ability of the placenta to regulate maternal-fetal transport of essential biomolecules. Nonetheless, harmful xenobiotics can potentially leak across from maternal to fetal circulations given that the placenta is a naturally semi-permeable barrier. Considering the safety, ethics, generalizability, and reproducibility limitations of in vivo and ex vivo studies, recent research efforts have focused on the optimization of in vitro models for assessing transplacental transport.

Methods: We built a transwell model of the placental interface, composed of fluorescently labelled BeWo trophoblast cells and human umbilical vein endothelial cells (hUVECs) in apposition across a fibronectin-coated membrane. BeWo cells were treated with epidermal growth factor (EGF) and forskolin (FSK) to induce placental trophoblast syncytialization. After a period of cell growth, we evaluated the transport of differently sized fluorescein isothiocyanate-conjugated dextrans (4- and 70-kDa) across the cultured transwell barrier.

Results: Fluorescent imaging confirmed stable BeWo and hUVEC cell growth over 7 days. In the EGF+FSK treatment condition, immunofluorescent staining indicated a loss of E-cadherin and increase in human chorionic gonadotropin expression, as characteristic of syncytialization. Transport experiments conducted on day 7 showed that the smaller 4-kDa probe crossed in greater amounts than the 70-kDa probe. While the BeWo+hUVEC co-culture decreased transport compared to single cell type controls, EGF+FSK treatment had no consistent effect on transport.

Conclusion: We established a stable transwell model of the placental barrier employing BeWo+hUVEC co-culture. Future experiments are poised to investigate transport of drugs and toxins within this transwell system.
Abstract Title
Music Care Partners Program Evaluation: Using music care to decrease social isolation and loneliness experienced by LTC residents

Author(s) – Li Maggie, Mackinnon Chelsea

Abstract description
Not available
Abstract Title
Identifying Novel Therapies for Endometriosis: The Effect of Melatonin on Endometrial Epithelial Cell Proliferation

Author(s) – Lim Jacqueline, Tan Christie (Chunyi), Foster Warren G.

Abstract description
Endometriosis is a debilitating disease affecting 10-15% of females at reproductive age, characterized by growth of endometrial epithelium and stromal cells outside the uterine cavity. The condition is believed to be estrogen-dependent: the growth of lesions depends on the proliferation of endometrial cells due to increased synthesis of estrogen. Melatonin is a hormone that may be therapeutically effective. Previous research revealed the expression of melatonin receptors (MT1 and MT2) in endometrial epithelial cells and also suggested that melatonin has the ability to reduce lesion size by suppressing cell proliferation. This investigation studied the effects of melatonin on human endometrium epithelial carcinoma cell (RL95-2) proliferation in vitro. Cells were treated with varying concentrations of melatonin (10^-10, 10^-9, 10^-8, 10^-7, and 10^-6 M). As a positive control, cells were treated with 10^-9 M estradiol to emulate endometriotic conditions. The cultures were incubated for 24 and 48 hours. Cell viability was measured using a colorimetric assay (MTT). Results indicate that estradiol alone had little effect on cell viability after 24 hours. However, at 48 hours, estradiol treatment significantly induced cell proliferation. While melatonin alone had no effect, cell proliferation was attenuated after co-incubation with melatonin and estradiol. Preliminary analysis suggests that melatonin may have potential as a prospective therapy for endometriosis, due to its ability to attenuate estrogen-induced proliferation. However, the exact mechanisms of action remain to be elucidated. Future steps involve studying melatonin on other endometrial epithelial cell lines and examining the effect of melatonin on estrogen receptor expression.
Pathway to Services: Mitigating Clinical Barriers Faced by Children and Youth with Autism Spectrum Disorder in Ontario through the Pediatric Autism Research Cohort (PARC) Project

Author(s) – Lin Grace, Kata Anna, Georgiades Stelios

Abstract description
Autism Spectrum Disorder (ASD) is a lifelong, neurological disorder characterized by deficits in social communication and interaction across different contexts. Recently, the Ministry of Children, Community, and Social Services announced significant changes to the Ontario Autism Program, wherein all families now receive direct funding to purchase services needed, rather than having an option between direct funding and direct services. Under these circumstances, there is an urgent need for clinicians, families, and the OAP intake agency to be informed on a child’s needs, identify the services needed, and find ways to access to those services. Although significant research on ASD interventions have been published, there exists a knowledge gap when it comes to the effect of interventions on different individuals over time. To address this knowledge gap, the Pediatric Autism Research Cohort (PARC) project, established by the McMaster Autism Research Team, developed the Autism Interventions Questionnaire (AIQ). The AIQ is a 5-page, self-complete questionnaire that captures the frequency, duration, cost, and funding of school services, behavioural interventions, communication and social skills interventions, and any other services aiding the child and/or the family. Data collected from the AIQ will be placed within the context of the PARC project, which seeks to establish a standardized research protocol within clinical care through mapping individual and group ASD development trajectories and systematically disseminate research findings to families and clinicians through an online platform.
Abstract Title
Systematic review of asthma and Chronic Obstructive Pulmonary Disease (COPD) burden, risk factors, and interventions for prevention and control in Malawi: The NCD-BRITE consortium

Author(s) – Lin Sabrina, Su Hsuan-Ming, Amberbir A., Jvan Oosterhout JJ

Abstract description
Recent studies have found an increasing burden of non-communicable diseases (NCDs) in sub-Saharan Africa. A compressive search of PubMed, Medline, EMBASE and the WHO Global Health Library databases was undertaken to identify studies reporting on the prevalence, risk factors, and management quality of asthma and chronic obstructive pulmonary disease (COPD) in Malawi. The findings from 17 included studies revealed a population with a large proportion of undiagnosed asthma and COPD. Based on the available literature, prevalence estimates currently range from 0.83%-12% and 0.16%-13.6%, respectively. Associated risk factors include ever-smoking, old age, female sex, lower BMI, employment in farming or dusty conditions, being HIV-positive, CO exposure, lack of access to private water supply, taller stature, and poverty. Nationwide, the quality of clinical care was generally limited and demonstrated a need for innovative and targeted interventions to prevent, control and treat NCDs in Malawi.
Abstract Title
Construction and Characterization of SLAMF7-DARPin as Antigen Binding Domain in T-cell Antigen Coupler

Author(s) – Liu Eva, Galina F. Denisova, Jonathan L. Bramson

Abstract description
Background: Chimeric antigen receptors (CARs) are genetically engineered cell surface receptors consisting of an extracellular antigen-binding domain and an intracellular T-cell signalling domain. T-cell antigen coupler (TAC) serves as an alternative receptor to CAR that operates through the native TCR pathway in order to achieve a more controlled T-cell response.

Objective: This project aims to assess the binding affinity and therapeutic potential of various SLAMF7 specific designed ankyrin repeat proteins (DARPin) molecules as an alternative antigen-binding domain in TAC-T cells.

Methods: SLAMF7-DARPin molecules were chosen through biopanning of a previously constructed DARPin library. The DARPin constructs were then cloned into a DARPin-GST plasmid and expressed in BL21 competent cells.

Results: The expressed DARPin proteins (DSD, NNY, DTA) were collected and tested for SLAMF7 binding using an enzyme-linked immunosorbent assay (ELISA). The results indicated that the SLAMF7-specific DARPin DTA showed much higher affinity binding to SLAMF7 compared to DSD and NNY which are not specific to SLAMF7. This validated the binding of DTA to SLAMF7 in prokaryotic systems.

Conclusion: SLAMF7-DARPin molecules chosen using biopanning were able to bind to their target in prokaryotic system. Additional research is needed to verify its binding in eukaryotic systems.
Abstract Title
Alternative Antimicrobial: Investigating Phage-Pseudomonas Biofilm Interactions

Author(s) – Liu Sophie Shu-Hsuan, Maddoboina Dhanyasri, Hosseini-Doust Zeinab

Abstract description
Pseudomonas aeruginosa is a ubiquitous gram-negative bacterium widely known for its multi-drug resistance. Classified as an opportunistic pathogen, it is one of the most common causes of nosocomial infections and a serious threat to public health. One of its protective mechanisms is its ability to form biofilms, complex multicellular communities that provide protection from antimicrobials and host defense mechanisms. Bacteriophage, commonly known as phage, is a class of virus that infect bacteria. Phages are able to amplify locally, encode biofilm-degrading enzymes, and are highly specific, thereby creating less stress on our body’s microbiome. Thus, phage therapy presents itself as a promising treatment for pseudomonas biofilm infections. The main objective of the research study is to develop a robust therapeutic phage cocktail for the treatment of multi-drug resistant pseudomonas biofilm infections. To achieve this, the aim of this project is to develop a high throughput microtiter plate model for screening phages that can effectively eradicate pseudomonas biofilms. In this project, we studied different conditions and effects – ranging from nutrient limitation to biofilm age – that may affect biofilm growth and phage effectiveness. Our findings suggest that phages are efficacious at eradicating pseudomonas biofilms. Thus, further research is desired to push this promising therapy towards clinical application.
Abstract Title
Narratives of Economic Immigrants

Author(s) – Lu Esther, Al-Saqqar Shahad

Abstract description
The purpose of this community research project is to understand the immigration experience of economic immigrants in Hamilton. In order for the City of Hamilton to provide the necessary resources to help current and future economic immigrants settle in Hamilton, we must first determine how the specific population felt about their transition and what could be changed to improve it. Through one-on-one interviews and focus groups with economic immigrants, personal experiences can be obtained. Questions that will be asked in the sessions include topics relating to their experiences with immigrating in general; programs/services they have used or are currently using; and factors that are affecting their decision to stay in or leave Hamilton. In addition, a survey will be administered after the focus group sessions to obtain a demographic representation of individuals participating in the study. After conducting the interviews and focus groups, we will have a better understanding on what factors will help attract and retain economic immigrants in Hamilton, as well as how we can better support the current economic immigrants in Hamilton. This research project is done in collaboration with CityLAB and our community partner Tammy Hwang, Business Development Officer - Global Hamilton, City of Hamilton.

Course Code
HTHSCI 4D06
Abstract Title
Evaluating Parameters of Offering Dialectical Behaviour Therapy to Youths

Author(s) – Lu Lulu (Jia), Dyce Lisa, Hughes Debra, Boylan Khrista

Abstract description

Objective: We examined the proportion of youths with suicidal behaviours that were offered Dialectical Behaviour Therapy (DBT) in McMaster’s youth psychiatric outpatient service, as well as how youths offered DBT differ from youths not offered DBT on the basis of routinely collected clinical features. Method: Medical history charts from 63 youths aged 12-17 years were obtained from McMaster Children’s Hospital between 2014 and 2015. Results: At baseline assessment, 55.6% of youths endorsed suicidal ideation (SI), 44.3% endorsed non-suicidal self-injury (NSSI), 32.8% reported a past suicide attempt (SA), and 27.4% reported no suicidality (ie. no SI, NSSI, nor SA). Of the 63 youths included in this sample, 37% were offered DBT. Youths offered DBT did not significantly differ from those not offered DBT in terms of age; however, there was a significant difference in terms of gender distribution across the two groups, with more females being offered DBT (n=21) than males (n=2) (Fisher’s Exact Test p<0.001). A significant relationship was observed between offering of DBT by clinicians and the youth’s endorsement of NSSI, SI, and SA at baseline. Youths who were offered DBT had significantly more psychiatric diagnoses, more trauma exposures, and significantly greater use of psychiatric medications. Conclusion: Among youths receiving tertiary care, clinicians appear to offer DBT to youths who have more complex mood disorders or indication of personality disorder.
Abstract Title
AMPK _1 is a Key Mediator of Metformin’s Anti-Atherogenic Effects in ApoE^{-/-} Mice

Author(s) – Lu Rachel, Day Emily A., Han Matthew, Morrow Marisa R., Ford Rebecca J., Steinberg Gregory R.

Abstract description
Cardiovascular diseases (CVDs) is one of the leading causes of death worldwide; in particular, atherosclerosis contributes to the majority of CVD events and mortality. The AMP-activated protein kinase (AMPK) is a key enzyme involved in important metabolic pathways and is being explored as a potential therapeutic target in treating CVD for its regulatory roles in lipid metabolism and inflammation. Metformin, an AMPK activator, is a first-line diabetes therapy that has demonstrated anti-atherosclerotic benefits in addition to glucose lowering, although the specific mechanisms and their relationships to AMPK remain unclear. In this study, we explored the extent to which hepatic AMPK plays a role in metformin’s anti-atherogenic effects via AMPK beta 1 subunit knockout (ApoE^{-/-} AMPK _1^{-/-}) mice fed chow or chow with 5g/kg metformin for 16 weeks. Aortic plaque size was significantly reduced in ApoE^{-/-} but not ApoE^{-/-} AMPK _1^{-/-} mice with metformin treatment. There were no differences in body composition, metabolic function, insulin sensitivity, or liver inflammation with metformin treatment. Plasma cholesterol was reduced with metformin in ApoE^{-/-} but not ApoE^{-/-} AMPK _1^{-/-} mice. Our data suggests that metformin exerts its anti-atherogenic effects in an AMPK dependent manner, likely through reducing circulating cholesterol levels. Future investigations are needed to elucidate the mechanisms in metformin’s cholesterol lowering effects and explore other possible contributors to plaque reductions.

Course Code
HTHSCI 4A15
Abstract Title
Culturally safe palliative nursing care for Indigenous peoples in Ontario: A literature, curriculum and policy review

Author(s) – Luft Jane, Downey Bernice

Abstract description
Background: Culturally safe palliative care (PC) for Indigenous peoples of Canada is of special need due to the spiritual and social importance of death and dying and the disproportionate experience of illness and mortality amongst this population. Nurses provide the most direct care to patients at end of life. This warrants an examination of the current competence and education of nurses in PC for Indigenous peoples as well as an examination of policy that may influence program development.

Methods: A literature review was conducted to determine the current level of competence in delivering culturally safe PC to Indigenous peoples. All Ontario BScN programs were reviewed to identify gaps in the nursing curriculum with respect to culturally safe PC for Indigenous peoples. Provincial and federal legislation, nursing associations and regulatory bodies’ policies, and large-scale commissions and reports were reviewed to identify policy that may guide program development.

Results: Literature review revealed 17 articles that identified specific needs for providing culturally safe PC, including a need for more cultural safety training of healthcare professionals. Curriculum review revealed that of program required courses, few of them discussed PC (average 12%), cultural awareness (21%), or caring for Indigenous peoples (9%). Policy review identified that PC is legally described in nurses’ scope of practice and providing culturally safe care is a legal obligation.

Conclusion: Literature and curriculum review identifies a need for improved PC for Indigenous peoples and existing policies support the development of explicit training to address this need in the Ontario nursing curriculum.

Course Code
HTHSCI 4A09
Abstract Title
Dissociating genotype and housing influences on Angelman Syndrome mice

Author(s) – Luo Owen D., Francella Cassandra, Horne Rachael, Faure Paul, Rilett Kelly C., Lai Jonathan K.Y, Foster, Jane

Abstract description
Accumulating evidence has implicated the gut microbiome in autism spectrum disorders (ASDs). Angelman Syndrome (AS) is an ASD-related neurodevelopmental disorder characterized by speech impairment, sleep disturbances, and an inappropriate happy demeanor. AS has been successfully modelled with the heterozygous, maternal deficient $Ube3a^{m-/p+}$ mice. However, recent studies have suggested that housing influences gut microbiota composition as gut bacteria are transmissible between mouse cage-mates. Thus, this study aimed to dissect the relative influences of host genetics and co-housing on the behavioural development and gut microbiota composition of $Ube3a^{m-/p+}$ mice. Male (n=11) and female (n=11) $Ube3a^{m-/p+}$ mice co-housed with their male (n=16) and female (n=10) wild type $Ube3a^{m+/p+}$ littermates as well as male (n=24) and female (n=16) wild type C57/Bl6 (B6) mice housed together were subject to a battery of behavioural tests and had their fecal samples collected. 16S rRNA gene sequencing profiled their gut microbiota. Genotype effects were explored by comparing $Ube3a^{m-/p+}$ and $Ube3a^{m+/p+}$ mice; similar comparisons between the $Ube3a^{m+/p+}$ and B6 mice explored housing effects. Maternal $Ube3a$ gene deletion was found to significantly impact early-life social communication, open field behaviour and sociability alongside associated changes in the genus-level relative abundance of *Bacteroides*. Housing was found to significantly impact growth and development, early-life social communication as well as altered the genus-level relative abundances of *Prevotella, Coprococcus, and Clostridium*. This study shows that housing significantly influences both the behavioural outcomes and composition of the gut microbiome of $Ube3a^{m-/p+}$ mice. This sheds light on environmental impacts on ASD development in mouse models.

Course Code
HTHSCI 4C09
Abstract Title
Correlating Incidence Densities and Point-Prevalence for the Surveillance of Catheter-Associated Urinary Tract Infections

Author(s) – Ma Gar-Way, O’Neill Cindy, Mertz Dominik

Abstract description
Background: Urinary tract infections (UTI) comprise the greatest proportion of hospital-acquired infections. UTIs occurring when an indwelling urinary catheter has been in place for greater than two days are known as catheter-associated urinary tract infections (CAUTI), and represent over 75% of hospital-acquired UTIs. Accordingly, health agencies recommend daily or weekly CAUTI incidence surveillance, straining healthcare resources. Consequently, utilizing periodic point-prevalence represents a less resource-intensive CAUTI surveillance method. However, the correlation between incidence and prevalence of CAUTIs has not been verified. Therefore, this study aims to correlate point-prevalence CAUTI rates with CAUTI incidence densities over the same period and population.

Methods: Incidence of CAUTIs, as defined by the Centers for Disease Control and Prevention, was captured at five Hamilton Health Sciences hospital sites from September 19 to December 12, 2018. CAUTI incidence densities stratified by ward per 1000 patient days or catheter days were compared with total point-prevalence per 100 beds from June, September, and December 2018.

Results: In total, incidence and prevalence surveillance captured 25 and 22 CAUTIs, respectively. A correlation coefficient R of 0.2424 and 0.0311 between incidence densities and point-prevalence is reported for patient days and catheter days based calculations, respectively.

Conclusion: The correlation coefficient R found approaches a weak positive linear relationship, and the correlation was not statistically significant (p=0.07). These findings raises serious concerns regarding the reliability of utilizing point-prevalence as a CAUTI surveillance method. Healthcare facilities should evaluate their CAUTI surveillance practices to ensure its burden is reliably and accurately captured.

Course Code
HTHSCI 3H06
Abstract Title
Predicting Depression from Longitudinal Data: Machine Learning vs Traditional Regression

Author(s) – Maaz Muhammad, Dobbs Graham

Abstract description
Non-physical outcomes are not easily clinically assessed and remain diagnostically elusive. It is in this context that building predictive models for such outcomes is a fertile area of research. Machine learning (ML) techniques have shown promise in this field, but there remains a dearth of literature related to its application to longitudinal data. In this study, we used the SHARE dataset to build a predictive model for depression, using data from 6 waves (spaced 2 years ago) for n=3564 individuals. We performed a random 80/20 training/testing split and constructed a linear regression (LR) model and a ML SGD (stochastic gradient descent) model, and applied them to the testing set. When income was included as a predictor, ML outperformed LR, and income was the most important predictor of depression regardless of model. However, LR outperformed when income was excluded. The usage of longitudinal data elucidated lagged variation effects. Depression figures most significantly in predicting current depression when it was present in the most recent time period, while income from 10 years prior was the most important predictor, suggesting a more long-term effect for income’s effects on depression. The machine learning model was more discriminate in its choice of variables – despite choosing fewer variables, it performed better. We have shown that while ML may perform better than LR in certain situations, it perhaps seems best suited to variable selection.

Course Code
HTHSCI 4D03
Abstract Title
An Analysis of Occupancy Rates in Hospitals: Results from a Cost-Minimization Model

Author(s) – Maaz Muhammad, Papanastasiou Anastasios

Abstract description
Occupancy rates are a key indicator of the performance of a hospital. However, there remains little consensus as to what the optimal occupancy rate is. In this paper we derive a cost-minimizing model incorporating results from queuing theory. Our model is novel as it is the first queuing theory application to healthcare that also considers the cost of expanding capacity. We model the hospital as a system in which patients arrive and leave the hospital as stochastic processes, and hence derived expressions for the optimal level of capacity and the relationship between capacity and occupancy rate. We show that the optimal capacity, and its corresponding optimal occupancy rate, is dependent on the cost of expanding capacity, the cost to patients of waiting, and the dynamic rates of patient arrival and discharge. Therefore, a singular occupancy target, as is the current paradigm in health policy, is unfounded. The model is easily generalizable and allows analysis of the effects of manipulating any of the aforementioned properties of the hospital. Such analysis yields surprising, unintuitive conclusions: for example, an increase in patient arrivals always increases the optimal occupancy rate, as the cost of capacity expansion limits the hospital’s ability to fully accommodate the influx. Considered in the context of the projected increased strain on hospitals in future, this result suggests that the healthcare system must explore alternate responses to burgeoning patient populations.

Course Code
HTHSCI 3H06
**Abstract Title**
Youth Wellness Centre (YWC) Safer Spaces for LGBTQ+ Clients

**Author(s)** – Marcuzzi Adrian, Gately Cole, Jeffs Lisa

**Abstract description**
Despite growing social acceptance, many young individuals in sexual and gender minority groups experience harassment, bullying, family rejection, and social stigmatization. This puts the demographic at an increased risk for depression and other mental health challenges. Support services offered by organizations can be valuable avenues to affirm youth identities, foster resilience, and mitigate risk factors. However, the implementation of such services does not always reach standards to effectively support youth in sexual minority groups.

Youth Wellness Centre (YWC) is a community centre associated with St. Joseph’s Healthcare Hamilton. YWC is a safe environment for young people age 17-to-25 to receive expert care for mental health and substance use concerns. The centre offers several programs, services, and supports for LGBTQ+ youth.

This project aims to learn how YWC can provide a safer and more supportive space for LGBTQ+ clients.

The centre recently released a feedback survey to their LGBTQ+ clients. The goals of the current project build on the findings of this survey, as well as probe for additional insights which the survey may not have captured. The methodology of the project follows four steps: 1) Analyzing the categorical and qualitative responses from the feedback survey, 2) Developing a set of interview questions. The set includes both questions from survey for the sake of gathering from a wider sample, as well as further inquiries based on the main findings of the survey responses, 3) Recruiting participants and conducting in-person interviews, 4) Presenting all findings in a 5-to-10-page written report.

**Course Code**
HTHSCI 4D06
Abstract Title
Xin as a novel regulator of mitochondrial morphology and function

Author(s) – Martin Grace, Chattha Rimsha, Gingrich Molly, Monaco Cynthia, Hawke Thomas

Abstract description
Disruptions to mitochondrial integrity have been implicated in metabolic diseases, such as diabetes and obesity. One potential mediator of mitochondrial integrity is Xin, a cytoskeletal adaptor protein, which has been localized to the mitochondria in skeletal muscle. The objective of this study was to characterize the metabolic and mitochondrial impairments of Xin deficiency with the metabolic stress of a high fat diet (HFD). Over the 8 weeks of HFD, Xin/-/- mice did not gain greater body mass relative to WT mice. Xin/-/- mice also did not display significant differences in fasted blood glucose levels and glucose tolerance after 8 weeks of HFD. However, electron microscopy analysis revealed a ~2.1-fold increase in mitochondrial density (p < 0.05) in Xin -/- mice compared to WT mice. The mitochondria of Xin/-/- mice also displayed structural impairments, such as swelling, streaming, and loss of cristae. Mitochondrial complex I and II supported respiration was significantly decreased in Xin/-/- mice when corrected to mitochondrial density (complex I: JO2 Xin-/-: 8.04 ± 0.50, WT: 19.96 ± 1.69; p<0.05; complex II: JO2 Xin-/-: 9.05, WT: 19.83 ± 2.16; p<0.05). Overall, Xin deficient mice demonstrate impairments to mitochondrial structure and function with no change to body mass or glucose handling. Future studies are needed to assess mitochondrial dynamics in Xin deficient mice and identify potential binding partners of Xin to further elucidate its function.
Abstract Title
Investigation of the Role of Endoplasmic Reticulum

Author(s) – Mazzoli V, Dang V, Shi Y, Zhong LH, Werstuck GH

Abstract description
Long term vascular complications of diabetes mellitus include both microvascular and macrovascular disorders, such as diabetic retinopathy and atherosclerosis, respectively. Past work has demonstrated that endoplasmic reticulum (ER) stress is involved in the progression of both diabetic retinopathy and atherosclerosis, suggesting that this process may be the underlying link between diabetes and vascular disease. However, the effects of ER stress in diabetic microvascular disease are not fully understood and the mechanisms involved have yet to be elucidated. Diabetic retinopathy is morphologically characterized by pathological changes in retinal capillaries, including pericyte loss and the formation of acellular capillaries. Death of retinal mural cells and inflammation compromises the structural integrity and function of retinal blood vessels, resulting in ischemia which reduces visual acuity. This work examined morphological changes associated with diabetic retinopathy in mouse models of hyperglycemia and evaluated the effects of 4-phenylbutyric acid (4PBA), an ER stress inhibitor, on characteristic symptoms of diabetic microvascular disease. Through immunofluorescence and Periodic Acid-Schiff staining, it was demonstrated that 4PBA treatment attenuates microvascular changes associated with diabetic retinopathy. 4PBA treatment significantly reduced microvessel loss, pericyte ghost and acellular capillary formation, and ER stress marker expression in hyperglycemic mice. The effects of 4PBA are increasingly prominent towards the peripheral retinal region. Furthermore, there was a significant decrease in microvessel density and increase in pericyte ghost density in hyperglycemic mice relative to controls, especially in the peripheral retina. This provides further insight into the mechanism of involvement of ER stress in the progression of microvascular disease.

Course Code
HTHSCI 4R12
Abstract Title
Comparison of the clinical effectiveness and safety between the use of denosumab vs bisphosphonates in post-renal transplant patients.

Author(s) – McKee Hayley, Adachi Rick, Lau Arthur

Abstract description
A retrospective chart review was conducted on adult post-renal transplant patients comparing Denosumab to bisphosphonate therapy. Denosumab resulted in significantly greater increases in lumbar spine BMD, with the absolute change in BMD at the lumbar spine being 0.045 g/cm² less in the bisphosphonate group as compared with the Denosumab group at final follow-up (parameter estimate of absolute change in BMD, bisphosphonate vs. denosumab: -0.045 g/cm² (-0.085, -0.005)). Similarly, the absolute change in BMD at the femoral neck was 0.022 g/cm² less in the bisphosphonate group as compared with the Denosumab group, at final follow-up (parameter estimate of absolute change in BMD, bisphosphonate vs. denosumab: -0.022 g/cm² (-0.053, 0.009)). Femoral neck BMD decreased over the treatment period in the bisphosphonate group (-0.0033±0.064 g/cm²). In accordance, absolute BMD increases were higher in the denosumab group compared to the bisphosphonate group at years 1, 2 and 3, although statistical significance was only observed at final follow up. Conclusions: Both treatments increased lumbar spine BMD, however, the effect of denosumab on was greater compared to that of bisphosphonate-treatment. Denosumab-treatment increased femoral neck BMD, whereas bisphosphonate-treatment had a mean decrease in femoral neck BMD at final follow-up. There was one report of hypocalcemia in the denosumab group. Our study provides evidence for the efficacy of denosumab treatment in post-renal transplant patients. Caution around hypocalcemia is warranted. We recommend more prospective studies to analyze the effects of long-term antiresorptive therapy in those with decreased renal function.

Course Code
HTHSCI  4A15
**Abstract Title**
Partnering with Patients and Family Members in the Adoption, Use, and Evaluation of Health Information Technologies

**Author(s)** – McLean Andrew, Leung Kevin, Kuziemsky Craig, Booth Richard, Collins Sarah, Borycki Eilizabeth, Strudwick Gillian

**Abstract description**
To date, health information technologies (HIT) have been implemented across many Canadian healthcare organizations, but often have not achieved the benefits predicted. Although the rationale for this is multi-faceted, several studies have indicated that auspicious outcomes of HIT can be attained when patients and family are effectively engaged in all stages of technology adoption, use, and evaluation. Using a multi-methods approach, this study aims to address the lack of research on best practices for involving patients, and their family members, in all stages of technology adoption, use, and evaluation. **Phase one** consisted of a scoping review to identify the existing studies and grey literature written about this topic. 871 articles were screened and 37 were included. Findings indicated a team-based approach with clear objectives, engagement early in the process, and the use of trusted staff are all useful. In **phase two**, two focus groups were conducted to identify perspectives from patients and family members on effective engagement strategies. The findings were consistent with the literature and identified logistical considerations, engagement practices, and the importance of training for health professionals. **Phase three** consisted of a symposium with 37 stakeholders to determine considerations for a resource document and identify the most effective engagement strategies using a nominal group consensus technique. Findings revealed the importance of governance structures, power dynamics, and training in engagement practices and an accessible, audience-specific resource document. The results of all phases will be used to inform the development of a Canadian patient and family HIT engagement resource.

**Course Code**
HTHSCI 4A15
Abstract Title
The Cardiovascular Effects of Recreational Cannabis Use: A Systematic Review

Author(s) – McNeill Kestrel, Sanger Nitika, Samaan Zainab

Abstract description
The recent legalization of cannabis (marijuana) in Canada has necessitated the investigation of both its adverse and advantageous effects on different populations. The use of cannabis has been reported to elicit a wide variety of physical and psychological responses by stimulating the endocannabinoid system (ECS). Various adverse cardiovascular events have been reported in temporal relation to recreational cannabis use. These include stress cardiomyopathy, arrhythmias, and vascular events such as myocardial infarction, transient ischemic attacks, and stroke. Due to the increasing amount of hybrid strains and potencies in recent years, it is crucial that the effects on physical health are measured in relation to the brand/strain of cannabis, as well as the relative potency. The routes of administration for cannabis use have also become increasingly diverse, and appear to distinctively influence adverse health outcomes. Systematic data is largely unavailable and required to fill the evidence gaps regarding the cardiovascular effects of recreational cannabis use, and the related impact of the route of administration and strain of cannabis used. This systematic review aims to investigate the potential harms cannabis use poses to the recreational user, specifically in regard to cardiovascular effects.
Abstract Title
Effects of a whey protein-based multi-ingredient supplement on muscle strength and hypertrophy in men and women: a double-blinded randomized controlled trial

Author(s) – Mohan Lenna, Wageh Mai, Fortino Stephen, McGlory Chris, Baker Steve, Phillips Stuart, Parise Gianni

Abstract description
The purpose of this study is to analyze the effects of a novel nutritional supplement on muscle gain and the muscle stem cell response following a resistance exercise training program. Recreationally active men and women between the ages of 18 and 30 years will be recruited as participants into the study, undergoing 12 weeks of tests, nutritional supplementation and exercise sessions. Participants will be required to undergo a series of tests in a particular order before and after training begins. These include: a diet record, an ultrasound of the biceps brachii and vastus lateralis, a bioelectrical impedance analysis, dual-energy x-ray absorptiometry, and one repetition maximum tests. Each participant will then be randomly assigned to one of two nutritional supplement groups: a multi-component whey protein-based (active) or collagen protein-based (control) supplement. These will be taken twice a day on both training and non-training days. Training sessions will occur four times a week for approximately 1 hour and will consist of a variety of arm and leg exercises with pre-determined sets, repetitions and rests, adjusting loads as needed. After all participants have completed the study, statistical and immunohistochemical analysis will be done to determine the effects of the experimental supplement on different measures of muscle hypertrophy, including muscle cross-sectional area, muscle thickness, and lean body mass. We hypothesize that our experimental supplement, along with a 10-week RET protocol, will result in greater muscle strength and hypertrophy compared to the control supplement.

Course Code
HTHSCI 4B06
Abstract Title
The Effects of Electronic Cigarette Fluids on Respiratory Ciliary Beat Frequency of Ciliated Nasal Epithelial Cells in Healthy Volunteers

Author(s) – Murong M, Girard V, Dolovich M.

Abstract description
Electronic cigarettes (EC) are one of the most commonly used tobacco products, especially among youths. They are often considered an alternative, and a means of harm reduction, for cigarette smokers. However, although it appears in literature that EC fluids are cytotoxic to many cell types, their specific impact on cell function, and whether this impact can be attributed to the flavoring ingredients or nicotine components of the fluid, has not been clearly elucidated. Since nasal cilia cells are the first to encounter aerosolized particles, this study examines the effect of EC fluid on mucociliary escalator health by measuring the ciliary beat frequency (CBF) after exposure to varying concentrations of the fluid, with or without nicotine. In this study, 11 healthy volunteers are recruited and 22 nasal epithelial cell samples are collected from them. The samples are perfused with increasing concentrations of excipient, which contain EC fluid within 10 hours of their collection. The different EC fluid tested in the sample include Peach Jam, Raspberry custard, and menthol flavouring. The effect of increasing concentrations of excipient on CBF of the nasal ciliated cells are measured and compared. For the samples collected for the six subjects recruited in the study thus far, it appears that there is a decrease in the average % of baseline CBF as the excipient concentration increases. This trend was observed for all three EC fluid types examined.

Course Code
HTHSCI 4W03
Abstract Title
Strengthening the Training of Crisis Helpline Personnel in India

Author(s) – Murong M, Newberry J

Abstract description
Between 2012-2013, India’s Department of Telecom piloted the first nationwide toll-free helpline for women in India, the “181 ERS Helpline for Women in Distress” (181 EHWD), in response to increasing reports of violence against women. This initiative was implemented through partnership between the Gujarat state government’s Women and Child Development Department (WCDD), the Home Department, GVK Emergency Management Research Institute, and the Tata institute of social sciences. This service is operated by specially trained response officers and counsellors, and has received 73 000 calls and dispatched over 18 000 rescue vans over a period of 9 months. In order to scale-up the program, efforts to improve the training of response officers and counsellors employed by the crisis helpline are underway. This scoping review seeks to understand the literature that exist on the training of gender-based violence survivor services providers, in order to provide theoretical grounding for the design and implementation of the new training protocol. The scoping review will search the databases PubMed, Psych Info, Web of Science, and Medline, and will seek to clarify the topics covered, strategies employed, and stakeholders involved in the training programs discussed in existing literature.

Course Code
HTHSCI 4G09
Abstract Title
Prevalence of Comorbidity in Prostate Cancer: A Preliminary Review for Analysis of the Relationship Between Comorbidity and Treatment Choices

Author(s) – Murphy Lara, Leong Darry

Abstract description
Background and Objective:
Prostate cancer is one of the most common diseases in Canada, with a long life expectancy relative to other forms of cancer. Due to this, it is likely patients will experience comorbidity at some time for this disease. Comorbidity is negatively associated with overall survival. However, while considerations need to be made for the life expectancy and risk of complications with treatments, comorbidity may lead to physicians under-treating the patients for the cancer itself, which may impact patient outcomes and cancer-specific survival. The objective of this review was to assess current knowledge surrounding comorbidity in prostate cancer. This will act as foundational and preliminary work in the subsequent analysis of comorbidity and aggressiveness of treatment choices in a prostate cancer patient population.

Methods:
First, the Cochrane Library was searched. Subsequently, a systematic search was conducted on Ovid Medline for clinical guidelines and randomized control trials using the strategy detailed under Methodology. Studies must have evaluated comorbidity in prostate cancer populations. Articles chosen had the full paper available online in English.

Findings:
Analysis of large patient data samples in the United States have observed that common chronic conditions comorbid with prostate cancer include diabetes mellitus, congestive heart failure (CHF), chronic obstructive pulmonary disease, and cerebrovascular disease. Comorbidity is positively associated with increased health system costs for prostate cancer patients. Comorbidity is seen to negatively affect the likelihood of receiving curative treatments and overall survival for prostate cancer patients.

Course Code
HTHSCI 4B06
Abstract Title
Monounsaturated Fat Consumption and Cardiovascular Health: a Systematic Review and Meta-Analysis

Author(s) – Nabieva Karina, Karimi Arian, Sikder Omaiike, Banfield Laura, de Souza Russel J

Abstract description
There is currently a lack of systematic reviews of prospective studies regarding the impact of monounsaturated fatty acid (MUFAs) consumption on cardiovascular diseases and diabetes. Given that prospective studies allow for long-term follow-up and thus enough time to observe events, this systematic review was designed to analyze such types of studies. For this review, MEDLINE, EMBASE, CINAHL, and Web of Science databases were used to identify studies through November 12, 2018. Observational studies outlining the impact of MUFA consumption on cardiovascular disease (CVD), diabetes, and mortality in healthy humans were considered to be eligible. The studies’ outcomes, number of cases, amount of MUFA intake, and the type of MUFA consumed were abstracted. Out 147 reports eligible for full text review, 37 were included in the abstraction for meta-analysis.

Course Code
HTHSCI 3H06
Abstract Title
Return to Sport Following Coracoid Bone Block Transfer for Shoulder Instability: A Systematic Review

Author(s) – Nadeem Ibrahim M., Vancolen Seline, Horner Nolan S., Alolabi Bashar, Khan Moin

Abstract description
Background: Shoulder dislocations can be a devastating injury for athletes. Coracoid bone block transfer is often utilized for the treatment of recurrent shoulder instability.

Purpose: The purpose of this study was to evaluate the rate of return to sport in patients following coracoid bone block procedures.

Study Design: Systematic review

Methods: The electronic databases MEDLINE, EMBASE, and PubMed were searched for relevant studies and pertinent data was abstracted. Only studies reporting return to sport following a coracoid bone block procedure were included.

Results: A total of 44 studies evaluating 2460 shoulders in 2390 patients were included in this systematic review. The majority of subjects were male (84.2%) and athletes (86.6%). The mean age at surgery was 26.2 (14-69) years. The most commonly reported sport was rugby (n=341). All studies were of level II-IV evidence of fair methodological quality. The rate of return to sport to any level was 88.8% (1954 / 2200 patients) and return to preoperative level of competition was 72.3% (1149 / 1590 patients). The mean time to return to sport was 5.2 months (range 21 days to 36 months).

Conclusion: Coracoid bone block transfer allows for a high rate of return to sport including return to sport at preoperative levels. A large high quality randomized trial is required to definitively provide evidence to support the optimal treatment for recurrent shoulder instability particularly in the contact athlete.

Course Code
HTHSCI 4A15
Abstract Title
Access to Mental Health Care Services of Migrant Children in Canada

Author(s) – Naidu Sumana, Pan Rachel, Ma Steven, Georgiades Katholiki

Abstract description
Currently, two-thirds of Canada’s population growth is attributable to immigration, and it is important to consider the mental health needs of this next generation of Canadians. It is estimated that only 1 in 5 Canadian children who require mental health services receive them, with migrant children in particular underutilizing mental health services. However, research into this specific topic area is limited. Given this issue, this project examines the facilitators and barriers to access to mental health care services for migrant children. This study utilizes data from the Hamilton Youth Study (HYS), a cross-sectional study of 1,456 students in grades 5-8 attending 36 schools in Hamilton, Ontario. The variables characterized in this study include: language, migrant status, SES, sex, trauma, parental distress, mental health, and service use for physical health to see their effect on the dependent variable of migrant youth service use for mental health concerns. As the migrant population in Ontario continues to grow rapidly, this project aims to address the practical implications of mental health care access for migrant children to better improve policy and practices.
Abstract Title
Improving Resource Coordination Between CARPHA and their Development Partners

Author(s) – Nair AG, Sobers C, McKinlay J, Lavis J

Abstract description
Background: The Caribbean Public Health Agency (CARPHA) coordinates the health efforts of its 26 member countries and functions as the singular voice for the region. For effective functioning, it requires both financial and technical assistance from various partners. However, the lack of clearly defined roles and responsibilities is leading to duplication and fragmentation of efforts. The goal is to develop a partnership coordination mechanism to effectively manage health resources to maximize its public health impact.

Method: A literature search was conducted on PubMed and Google Scholar to identify articles outlining effective partnership and resource coordination mechanisms. Hand searches were also conducted to find documents from international health-affiliated organizations including the World Health Organization, World Bank and so on. Then, the mechanisms most appropriate for CARPHA’s context was identified from the literature. Information about CARPHA’s partner organizations and their contributions were also compiled.

Results: A Development Partner Coordination Committee (DPCC), comprising of CARPHA and nine of its partners, was identified as the optimal way to arrange the relationship between CARPHA and its development partners. It will be co-chaired by CARPHA and an elected development partner. A document outlining the roles and responsibilities of all involved parties was created and approved by the DPCC members.

Conclusions: The development of the DPCC will allow for greater harmonization amongst health-sector programs and initiatives. The increased channels of communication and transparency amongst partners will help mitigate duplication of efforts, leading to greater partner confidence in CARPHA and the work completed by the organization.
Abstract Title
The Creation and Efficacy of a Modified Collaborative Learning Style on Students Engagement and Retention

Author(s) – Nanji Jasmine, Stamp Quinlan, Venugopal Nainka

Abstract description
Objectives
McMaster Children and Youth University (MCYU) wishes to establish a Community Learning Implementation Program that is focused around integrating the advantages of learning styles currently practiced in schools such as, collaborative learning, problem based learning, conventional learning, cooperative learning and reciprocal learning to form a novel style called modified collaboration. The project further analyzed external factors that affect the types of learning, namely, student gender, parental involvement in their child’s education and familial socio-economic status. Subsequently, a qualitative survey aimed at analyzing the success of the new learning style after it’s implementation was created and refined.

Course Code
HTHSCI 4A15
Abstract Title
Obesity interventions for Australian Aboriginal youth – identifying ‘what works’

Author(s) – Naqvi Nawazish, Sherriff Simone, Thurber Katherine, Baur Louise A, Muthayya Sumithra

Abstract description
Objectives: To understand (1) the strategies that have been employed in obesity prevention programs for Aboriginal young people in Australia; (2) the barriers and facilitators influencing in the success of these interventions; (3) the evidence gaps present in the literature regarding these obesity prevention interventions and (4) the recommendations that have been made to improve the effectiveness of these interventions.

Methods: Databases, including MEDLINE, PsychInfo, Embase, Global Health and HealthInfoNet were searched to identify peer-reviewed and grey literature published between January 1995 - October 2018 concerning obesity interventions for Aboriginal youth in Australia.

Results: Fourteen studies and reports met the inclusion criteria and contributed to the inclusion of nine obesity interventions. The intervention programs varied in their adoption of family (4), community (3) or school-based (2) approaches to address childhood obesity and only three small-scale interventions were designed specifically for Aboriginal youth. In certain interventions with both Aboriginal and non-Aboriginal youth, Aboriginal youth were found less likely to participate in the program than non-Aboriginal youth, demonstrating a need for culturally appropriate interventions for Aboriginal youth. Interventions with both Aboriginal and non-Aboriginal youth did not provide Aboriginal specific-results, limiting our ability to identify their effectiveness among Aboriginal youth.

Conclusions: The scarcity of obesity prevention interventions for Aboriginal youth is concerning, considering the need to address the high rates of overweight and obesity among Aboriginal youth. This review highlights the need for culturally appropriate interventions for Aboriginal youth and for future interventions to be developed in close collaboration with Aboriginal communities.
**Abstract Title**
Treatment Sequences in ITP

**Author(s)** – Nazaryan Hasmik, Liu Yang, Arnold Donald M.

**Abstract description**
Immune Thrombocytopenia (ITP) is a rare autoimmune disorder, occurring in two subtypes, primary or secondary, both of which present with characteristic low blood platelet counts and can result in mild to severe bleeding. As a highly heterogeneous disorder with complex pathophysiology, challenging diagnosis and a multistage prognosis, treatment for ITP is complicated and moreover, lacks well-defined and consensus-based official guidelines. Hence, this retrospective cohort study aims to describe the sequence of treatments in adult primary and secondary ITP patients from the McMaster ITP Registry in order to identify commonly occurring ones. A treatment sequence is defined by the start dates of individual treatments in chronological order and regardless of their stop dates. Conclusions from the analyses of these sequences can then potentially be used towards hypotheses generation for future research. The McMaster ITP Registry database has been used primarily for obtaining data variables including patient demographics, records of individual treatments, platelet counts, and bleeding events. Moreover, any missing start and stop dates of treatment records have been completed through review of patient medical charts. Preliminary findings have revealed a total of 92 unique treatment sequences in a population of 222 patients. The magnitude of this number reflects the heterogeneity of ITP as a disorder and the complex nature of its treatment process. Furthermore, this finding indicates a need for further analysis such as by grouping treatment sequences based on potentially confounding variables including diagnosis type, disease severity, duration of follow-up, platelet count responses, and bleeding events.

**Course Code**
HTHSCI 4A12
Abstract Title
Strategies to mitigate pain and anxiety in IUD insertion: A systematic review

Author(s) – Nguyen Laura, Lamarche Larkin, Lennox Robin, Mangin Dee

Abstract description
Introduction: One barrier to the use of intrauterine devices (IUDs) as a contraceptive method is the experience of pain and anxiety during the insertion procedure. Previous reviews have focused on pharmacological methods used to relieve pain during IUD insertion, however few similar reviews have examined non-pharmacological methods, or strategies to reduce anxiety. The objective of this study was to identify and categorize strategies for reducing anxiety and pain with respect to IUD insertion, and the ways in which pain and anxiety were assessed. In particular, we wanted to identify non-pharmacological interventions and studies that included anxiety as a research outcome.

Methods: A literature search of all English language studies between inception to the week of July 29, 2018 from the following online databases: Embase, Cochrane Library, and PubMed.

Results: Our search revealed 426 studies after removal of duplicates, 35 of which fulfilled the inclusion/exclusion criteria. We identified 29 studies assessing pharmacological interventions for the management of pain, and 6 studies assessing non-pharmacological interventions. Only 1 study included a measurement of patient anxiety during the procedure as an outcome measure.

Discussion: Research on non-pharmacological interventions for the management of anxiety and pain during IUD insertion is lacking. Furthermore, there is weak or conflicting evidence for the studied pharmacological interventions, and very little evidence for strategies to manage anxiety during the IUD insertion procedure. Further high-quality research comparing pharmacological and non-pharmacological strategies is warranted, as well as examinations of different strategies for anxiety management.
Abstract Title
The Genetic Association Between Risk Tolerance and Cardio-metabolic Health Outcomes: A Mendelian Randomization Study

Author(s) – Omidi Arghavan, Paré Guillaume

Abstract description
Risk tolerance is defined as the willingness to take risks. Its genetic associations have recently been identified, creating potential for further investigation. In this study, 36 candidate genetic variants significantly associated with risk tolerance were used in a Mendelian Randomization study in order to investigate their association with 11 cardio-metabolic health outcomes (blood pressure, body mass index, coronary heart disease, high-density lipoprotein cholesterol, low-density lipoprotein cholesterol, smoking - cigarettes per day, smoking - ever smoked, total cholesterol, triglycerides, type 2 diabetes, waist-to-hip ratio). The genetic variants tested had a significant causal relationship with the genetic basis of waist-to-hip (WTH) ratio (=0.313±0.202, p=0.0023). This positive association indicates that the greater the genetic predisposition to risk tolerance, the greater the genetic burden of having a larger WTH ratio. These results can have large scale implications as WTH ratio is an easily attainable anthropometric measurement and research on genetic associations with WTH ratio is widely abundant. Moreover, it has been identified as predictor for many other cardiovascular complications, presenting more opportunities for further exploration.

Course Code
HTHSCI 4A15
Abstract Title
A C. elegans Barcode: Using a Panel of Fluorescent Worm Reporters to Characterize Bacteria

Author(s) – Ong Jonathan, MacNeil Lesley T., Surette Michael G.

Abstract description
Introduction
As a model organism that is highly accessible and well annotated, the nematode C. elegans is an excellent tool for screening the human microbiota how they can affect host health.

Research Questions
We wanted to use a panel of C. elegans fluorescent transcriptional reporters to investigate how the certain bacteria can affect the expression of certain genes in the worm.

Procedures
We exposed the worms to standardized set of conditions that included: validation conditions such as heat shock, a variety of live microbiota bacteria, and also several bacterial supernatants. We then observed the worms under a fluorescent compound microscope and subsequently quantified their fluorescence using ImageJ analyses.

Results
We found that many of the conditions we exposed the reporters to produced unique patterns of gene expression across all of the reporter strains we used. We also found striking differences between worms exposed to different strains of the same bacteria species, as well as worms exposed to live bacteria compared to the supernatant of the same bacteria. These findings have presented us with a many promising hypotheses to further investigate. In doing so, this project has proven the usefulness of using fluorescent C. elegans reporters as a screening tool for studying novel ways in which bacteria can interact with its host.
Abstract Title
Determining the effects of bilingualism on domains of cognition from infancy to childhood

Author(s) – Parthasarathy Prasiddha, Bhaloo Insiya, Molnar Monika

Abstract description
This systematic review (in progress) broadly explores the question of how bilingualism affects domains of cognition, from infancy to childhood. Currently, there is abundant literature on bilingualism and its effects on cognition; however, differing facets of cognition are often discussed and effects of the “bilingual advantage” vary. Thus, the aim of this review is to disentangle what cognition refers to in this context and categorize the various subcomponents of cognition that have been addressed in the literature. A literature search of 5 major databases (ERIC, LLBA, PsycInfo, Web of Science, PubMed) was conducted along with a manual search of reference lists of past reviews on bilingualism and cognition, retrieving a total of 5676 articles. The titles and abstracts of these studies are currently being screened (by 2 reviewers), in accordance with PRISMA guidelines, to ensure the inclusion of cognitive outcome measures among other criteria. Overall, by separating the effects of bilingualism on different domains of cognitive development, more clarity on the “bilingual advantage” can be established. In addition, the results of this systematic review can have wide-ranging implications on cognition-based educational considerations for bilingual students and teachers, to better facilitate learning.

Course Code
HTHSCI 3H03
Abstract Title
THE EFFECT OF THE PREGNANCY AND LACTATION LABELING RULE ON PRESCRIBING INFORMATION OF FDA APPROVED DRUGS

Author(s) – Patel A., Fusch G., Chan A., van den Anker J., Mazer-Amirshahi M., Samiee-Zafarghandy S.

Abstract description
Not available
Abstract Title
Comparison of Pediatric Data in Drug Monographs Approved by Health Canada and the U.S. Food and Drug Administration

Author(s) – Patel Ashaka, Raja P., Samiee-Zafarghandy S.

Abstract description
Not available
Abstract Title
Residency Training May Be Key to Better Pain Management in Rheumatoid Arthritis

Author(s) – Patel Kashyap, Seidlitz Eric

Abstract description
Rheumatoid arthritis (RA) is a progressive inflammatory disease characterized by joint destruction, synovitis and autoantibody production. Evidence has found insufficient pain management a major concern amongst RA patients. Since rheumatologists are not trained to address pain concerns, they refer RA patients with pain issues to pain clinics which often have long wait times. The current project aimed to summarize and improve RA pain management strategies and protocols as well as make evidence-based recommendations to residency training curricula. Publications by the Canadian Rheumatology Association, the European League Against Rheumatism and the American College of Rheumatology were consulted for disease treatment protocols and pain management strategies. Furthermore, publications outlining the training objectives for Canadian residency programs were obtained from the Royal College of Physicians and Surgeons. In order to make evidence-based recommendations to the curricula, The Cochrane Library was searched for systematic reviews on the efficacy of different treatment modalities. Evidence indicated that pharmacological treatment for RA pain such as analgesics, anti-inflammatory drugs, opioids and anti-depressants were at the core of pain management. Additionally, a variety of non-pharmacological treatments, such as cognitive-behavioural therapy and transcutaneous electrical neural stimulation therapy, were recommended. This evidence was used to provide guidelines for effective RA pain management techniques to the rheumatology residency curriculum. Moreover, the project provides a multidisciplinary, patient-centred approach to treatment using the biopsychosocial perspective. These guidelines aim to equip rheumatologists with resources to address their patients’ pain concerns in a timely manner.

Course Code
HTHSCI 3H03
Abstract Title
Prevalence of genetic mutations causing monogenic forms of diabetes

Author(s) – Philip Kaylyssa, Meyre David

Abstract description
Background: Monogenic diabetes is a rare form of diabetes resulting from a single gene defect. It can be further divided into Neonatal Diabetes (NDM) and Maturity Onset Diabetes of the Young (MODY). Few studies, restricted to populations of European ancestry, on the prevalence of monogenic gene mutations have been conducted.

Objective: This paper investigated the prevalence of monogenic gene mutations within the general population, using sequencing data from the Genome Aggregation Database (gnomAD).

Participants: gnomAD includes the sequenced genomes of 141,456 unrelated individuals across eight ethnic groups. 28 established NDM and MODY genes were identified and the inheritance model of each was established.

Methods: Using gnomAD, mutations in each gene were examined. Nonsense, splice acceptor, splice donor, and frameshift mutations were considered loss of function. It was determined if missense mutations significantly impacted protein function by utilizing the PolyPhen 2 and SIFT softwares.

Data Analysis: The total number of harmful alleles for each gene was calculated by summing all of the alleles with mutations that significantly impacted protein function. The homozygous count for all significantly harmful mutations was doubled and subtracted from the total number of harmful alleles to determine the number of harmful heterozygous alleles. The prevalence of homozygous mutations was calculated by dividing the homozygous count by half of the total alleles. Similarly, the prevalence of heterozygous mutations was calculated by dividing the heterozygous count by half of the total alleles.

Conclusion: The global prevalence rate of NDM and MODY was determined to be 3.6% and 3.1% respectively.

Course Code
HTHSCI 4A15
Abstract Title
Cardiovascular ICU Nurses’ Feedback on the use of the ChloraLock™ Device: A Survey as part of the CHG Pilot Study.

Author(s) – Pook Makena, McDonald Ellen, Benoit Pamela, Coyne Alice, Blair Melanie, Zamir Nasim, Fox-Robichaud Alison

Abstract description
ChloraLock™ (CHG) is a new medical device being piloted in a feasibility RCT trial. The device aims to decrease the risk of central line associated bloodstream infections (CLABSIs) in an ICU setting. CLABSIs account for 87% of all primary nosocomial bloodstream infections in North America, leading to increased mortality, length of stay, and readmissions. The use of CHG requires Registered Nurses (RNs) to perform additional steps during routine intravenous line care in an already busy environment. It is unknown how RNs involved in the trial will operationalize the study for optimal compliance with the protocol.

Objective
To assess uptake of the CHG protocol by ICU RNs working in our Cardiac Surgical Unit to determine areas of improvement for compliance before expanding the study to additional ICUs.

Methods
We developed a 9-item questionnaire under 4 domains: 1. comfort with and ease of study related tasks, 2. time for device use and documentation, 3. compliance, and 4. effectiveness of educational activities and support material. Respondents also provided demographic data including years of overall nursing experience and experience in the CV-ICU.

Prior to distribution, the questionnaire was pilot tested using a convenience sample of 6 ICU RNs. Further refinement of the questionnaire involved clinical sensibility testing using a convenience sample of 6 ICU RNs who provided feedback on appropriateness, redundancy and completion time of the tool.

To provide RNs with reasonable learning time and exposure to CHG, we waited until 10 patients had completed the study before we began questionnaire administration. Paper versions of the questionnaire were distributed to RNs that cared for study patients.

Results
Surveys were completed by 22 of 38 (57%) RNs, caring for at least one of 6 study patients. Twelve (60%) nurses reported greater than 15 years nursing experience and 11 (55%) had greater than 15 years CV-ICU experience. All RNs found using the device to be either “easy”, “very easy” [18 (85.7%)] or “not difficult” [3 (14.3%)]. Most nurses 13 (65%) “felt comfortable using the device”, 11 (55%) reported less than 1 minute required for use of the device and 12 (60%) reported less than 1 minute to document each use. Two thirds of RNs found using the device presented ‘no change’ to their workload [14 (66.7%)].

The most common reasons for failing to use the CHG device properly (ie withdraw from line or lock as indicated) were: 6 (33.3%) required urgent access to IV; 4 (22.2%) forgot; and 3 (16.7%) were unaware patient was in the study.

Although less than 80% of RNs found educational activities and support material “effective”, there was room for improvement. Open ended responses revealed the need for a shorter interval between in-servicing and patient enrollment.
Respondents who found study staff more helpful also reported CHG was easier to use (d=0.439, p=0.047), required less time for use (d=-0.576, p<0.001), and increased their workload less (d=0.351, p=0.019).

**Conclusions**

In this pilot study for a new device to reduce bacteremia in an ICU patient population, RNs reported use of the device was not time-consuming or burdensome. There is room for improvement of educational activities and support material. We have created a video outlining RN’s responsibilities, which should address this limitation. In-servicing should occur in tandem with patient enrollment. We will engage Nurse Champions to provide RN support. Moving forward, we will pilot and evaluate these new educational initiatives.
Abstract Title
Functional Rehabilitation for Non-Operative Treatment of Mid-Shaft Clavicle Fractures: A Systematic Review

Author(s) – Pupic Nikola, Catapano Michael, Hoppe Daniel, Henry Patrick, Nam Diane, Robinson Lawrence R., Wasserstein David

Abstract description
Study Design: Systematic Review

Background: Although surgical management of mid-shaft clavicle fractures are increasingly common, the majority are still treated non-operatively.

Objectives: This systematic review aims to elucidate a rehabilitation program that optimizes and expedites recovery based on published approaches and outcomes.

Methods: A comprehensive search of three databases was completed. Inclusion criteria consisted of clinical studies addressing the non-operative management of mid-shaft clavicle fractures published in English with reported outcomes.

Results: Ten studies from the 2112 studies that were eligible for title screen satisfied inclusion criteria. A total of 613 patients (mean age of 34 years) with a mean follow-up period of 18 months were included. Nearly all fractures (99%) were displaced on initial assessment. Included studies without a strict immobilization period had a mean non-union rate of 16+/-8% and residual pain in 53+/-23% of patients compared to studies with a strict immobilization period with a mean non-union rate of 11%+/-8 (p<0.001) and residual pain in 23+/-12% of patients (p>0.001). Patients who underwent a strengthening protocol had statistically significant improvements in Constant Score, 92.2+/-3.3 compared to 83.3 +/-2.0 (p<0.001), and non-union rates, 12+/-8% and 18+/- 4% (p<0.001).

Conclusion: Studies with rehabilitation protocols that progressed from immobilization to strengthening exercises demonstrated lower non-union rates, lower residual pain, and greater functional recovery. We recommend an immobilization period of 3-weeks with a subsequent 3-weeks of gradual passive ROM and limited active ROM to the horizontal plane, culminating with full active ROM and strengthening protocol beginning at 6-weeks.
Abstract Title
Targeting Mitochondrial Metabolism of Cancer Cells in Combination with Cytotoxic Therapy

Author(s) – Quan Can Yang Zi (Sunshine), Mekhaeil Bassem, Biziotis Olga-Demetra, Tsakiridis Evangelia, Zacharidis Panayiotis G., Broadfield Lindsay A., Menjolian Gabe, Muti Paola, Steinberg Gregory R., Tsakiridis Theodoros

Abstract description
Background/Purpose: Lung cancer is the most fatal type of cancer, in part due to resistance to conventional cytotoxic therapy. There is need to identify chemo- and radio-sensitizing agents in lung cancer or develop novel therapeutic approaches. Deregulation of cancer cell metabolism, particularly the elevated glutaminolysis via the mitochondrial enzyme glutaminase (GLS), can be therapeutically exploited. The anti-proliferative effects of the pharmacological inhibitor of GLS, CB-839 (Calithera Bioscience Inc.), were assessed through in vitro measures. The chemo- and radio-sensitizing potential of CB-839 and possibility of dual-metabolic targeting alongside the complex I inhibitor metformin are further investigated.

Methods: Proliferation and clonogenic assays were conducted on the human lung adenocarcinoma cell line A549. Varying doses of CB-839 were tested in combination with cisplatin, radiation therapy (RT), and/or metformin and inhibition on A549 cell growth was measured.

Results: CB-839 inhibited the proliferation and clonogenic survival of A549; the inhibitory effects were mitigated by the supply of extracellular glutamate. CB-839 significantly enhanced the effectiveness of cisplatin and exhibited synergism when combined with RT. Dual metabolic targeting with CB-839 and metformin is being investigated.

Conclusion: GLS inhibition drastically reduces the proliferation of lung cancer cells and presents a promising route for chemo- and radio-sensitization in lung cancer. These and future studies will help support the clinical development of CB-839 in the treatment of lung cancer in combination with cytotoxic therapy.
Abstract Title
Development and Implementation of a Geriatric Competency Framework for Undergraduate Medical Curricula in Canada

Author(s) – Qian Dorothy, Costa Andrew

Abstract description
The purpose of this project was to review and critically evaluate existing literature and current undergraduate medical curricula in order to develop a core set of geriatric competencies that have the most potential impact upon future performance and positive attitude towards geriatrics. An environmental scan was conducted regarding current teaching structures for undergraduate medical students as well as geriatric competencies. Upon analyzing the literature for recurring themes and competencies common across multiple frameworks, six core competencies encompassing medication management, falls, balance, and gait disorders, cognitive and behavioural disorders, functional assessment, transition of care, and atypical presentation of disease were found. Five core skills shown to correlate with effective geriatric care were also generated, and preliminary recommendations were made on implementing these competencies within undergraduate medical curricula. Altogether, the integration of these geriatric competencies and skills will both improve attitudes and confidence among undergraduate medical students in Canada.
Abstract Title
Adherence to Web Design Principles in the Plumbing and Fixtures Industry

Author(s) – Rei Stephanie, Ryan Veronica

Abstract description
While extant literature makes general recommendations for web interface design, industry-specific research is still in its infancy. Since it is unclear whether these recommendations are generalizable across industry, adherence to literature recommendations were measured to determine whether there is a correlation to fiscal sales in the plumbing and fixtures industry. Adherence rates were also used to identify specific parameters that could be optimized on the American Standard website. Based on 2017 fiscal sales, six companies, namely American Standard, Kohler, Toto, Moen, Delta, and Gerberit, were selected for evaluation. The Canadian (or North American) websites of each company were evaluated by the author based on 34 items organized under seven design parameters: (1) usability; (2) technical adequacy; (3) visual aspects; (4) security & reliability; (5) content; (6) communication; and (7) participation & community/collaboration. Industry adherence was found to be roughly equivalent for technical adequacy ($\sigma^2=0.000$) and communication ($\sigma^2=0.010$). Visual aspects adherence scores were also largely homogenous; however, distribution negatively skewed due to an outlier score. Excluding visual aspects, security & reliability ($\sigma^2=0.067$) and usability ($\sigma^2=0.026$) had the largest variability in adherence. No correlation was derived between the adherence scores and the total 2017 fiscal sales of each company. Nonetheless, adherence scores identified shortcomings on the American Standard website for 5 out of the 7 evaluated parameters, namely technical adequacy, security & reliability, content, communication, and participation & community/collaboration.
Abstract Title
Distinct metabolic programs, not the expression of CD56 and CD16, define regulatory vs. cytotoxic NK cell subsets

Author(s) – Ritchie T, Poznanski SM, Zhang J, Singh K, Rojas E, Portillo A, Szabo E, Lye S, Ashkar AA

Abstract description
The expression of surface marker CD56 and Fc_RIII CD16 is traditionally used to distinguish natural killer (NK) cell functional subsets. Cytotoxic NK cells are predominantly CD56dimCD16+ whereas immunoregulatory, cytokine-producing NK cells are CD56brightCD16-. However, recent publications have challenged this classification system, contradicting the notion that CD56bright cells are poorly cytotoxic. The present work aims to clarify whether the expression of these markers serves as an appropriate identification method for NK cell function. Through the use of the K562 membrane-bound IL-21 feeder cell expansion protocol, we were able to convert immunoregulatory CD56superbrightCD16- uterine NK cells (uNK) to cytotoxic NK cells. A change in phenotype, however, did not accompany the functional change as the expanded uNK cells retained their CD56superbrightCD16- phenotype. Thus, CD56 and CD16 do not reliably dictate NK cell function but CD56 expression may indicate heightened activation. To determine a method better suited for differentiating NK cell function, we explored the metabolic profile of uNK cells and peripheral blood NK (PBNK) cells pre- and post-expansion. Unexpanded uNK cells demonstrate unique metabolic features however during expansion they adopt a glycolytic-based metabolism similar to PBNK cells. The metabolic signature of an NK cell is correlated to its function and may serve as a more accurate indicator to differentiate cytotoxic from immunoregulatory NK cell subsets.

Course Code
HTHSCI 4B06
Abstract Title
Post-treatment Needs Assessment in Cancer Care: Literature Review

Author(s) – Ruan B, Shakeel S, Finley C

Abstract description
Background: Literature surrounding the quality of life during the treatment phase of cancer patients has been well focused and established, however with the increase of quality of care and thus cancer survivorship, the unmet needs of patients during the post-treatment phase remains to be underreported. Routinely assessing patient needs allows the opportunity to further advance patient-centred care. Needs assessment tools allow healthcare professionals to identify areas of assistance required by cancer patients in the post-treatment phase. Although a variety of needs assessment tools have been developed, no standardized instrument has been recommended for clinical care. This literature review was conducted to compare and assess the evidence regarding the psychometric properties and content of needs assessment tools.

Method: Searches were conducted in OVID MEDLINE from 1946 and Cochrane Clinical Database. Selected articles were focussed on individual patient assessment for unmet needs, help, care or support and not for research or other purposes. Tools that additionally focused on a single domain of care were excluded.

Results: 16 comprehensive articles pertaining to needs assessment tools were retrieved, and 6 needs assessment tools were identified. Each tool was appraised for its contained items and its psychometric properties. None of the tools were found to contain all mapped domains of health status nor did any tool meet all sufficient evidence for all psychometric properties.

Conclusion: Despite a variety of needs assessment tools being developed, there is a need to further develop evidence evaluating the psychometric properties of needs assessment tools.
**Abstract Title**
Evaluating effectiveness of robot-assisted kidney transplantation in comparison to open transplant surgery: a systematic review, cost analysis and perceptions study

**Author(s)** – Sardar Huda, Lambe Shahid, Tajzler Camilla, Kapoor Anil

**Abstract description**
Introduction: As kidney function declines, patients can develop end-stage renal disease and undergo dialysis and/or kidney transplant surgery as treatment. Compared to dialysis, kidney transplants tend to improve quality of life, decrease costs, and are also associated with lower risk of death. Currently, conventionally open kidney transplant surgery is the gold standard, however, robotic-assisted procedures show promising potential. This is one of the first studies comparing open and robotic renal procedures, particularly the very first to look at cost and knowledge/perceptions.

Methods: A systematic search of Ovid-MEDLINE(R) and Embase databases was performed by a single reviewer from the date of origin to October 2018. A total of 833 studies were retrieved (n = 256 from Ovid-Medline and n=577 from Embase) and 12 studies were selected for analysis post-screening. A self-designed multiple choice questionnaire distributed to renal surgery patients (<2y), healthcare providers and administrative staff in the Department of Surgery at St. Joseph's Healthcare to assess perceptions surrounding and knowledge of both procedures. A side-by-side cost comparison of both procedures is in progress.

Results/Conclusion: Robotic and minimally invasive open procedures have many benefits, such smaller incision length and fewer wound complications. However, problems with the techniques include longer operative times, particularly, more time is required to perform the vascular anastomosis. Some gaps in knowledge exist in the understanding of robotic and open renal procedures, however, the robotic technique is preferred amongst staff and patients overall. Ultimately, the data is insufficient, suggesting the need for further research for a more conclusive understanding.

**Course Code**
HTHSCI 4A15
**Abstract Title**
Determining the Effectiveness of a Pain Ease® Spray Combined with Ametop Gel ™ to Reduce the Discomfort of Intravenous Insertion

**Author(s)** – Scheepers Rachelle, Poznikoff Andrew, Malherbe Stephan

**Abstract description**

**Background/Objective:** Currently the standard procedure in paediatrics is to apply Ametop Gel™ prior to IV insertions. However the range of effectiveness varies from 30% to 65% for pain free venipunctures. To minimize pain felt during IV insertions, this study aims to determine if using Pain Ease® spray as an adjunct to the standard use of Ametop Gel™ will increase the number of pain free venipunctures.

**Methods:** In this single blinded randomized control trial, patients were either assigned to the control group (Ametop Gel™ alone) or the study group (Ametop Gel™ and Pain Ease® spray). Ametop Gel™ was applied for >30 minutes and <60 minutes before being removed. The first IV attempt was performed <10 minutes once Ametop Gel™ was removed and either saline salt water or Pain Ease® Spray applied. Once successful IV is inserted, participants were asked to assess their pain using the Faces Pain Scale - Revised.

**Results:** A total of 229 participants were recruited, with 17 withdrawing due to failed IV start. Chi-Squared and Wilcoxon Ranked test were used to analyze the data. Self reported FPS-R were not significantly different (p=0.09). However when comparing the two groups based on reaction to skin puncture recorded by the independent observer, there was a significant difference (p=0.0005).

**Conclusion:** Combing Pain Ease® Spray with Ametop Gel™ did not significantly reduce the number of pain free IV insertions in pediatrics.
Abstract Title
Wait Times for Knee Arthroscopy: What are the Potential Impacts on Patient Quality of Life?

Author(s) – Sedrak Phelopater, Mauti Eric, Ayeni Femi, Denkers Matt, Peterson Devin

Abstract description
Knee arthroscopies are a subset of elective orthopaedic surgeries in Canada, in which patients are scheduled for their surgeries based on a waitlist. Investigating the impact of waiting for surgery on patient overall health and quality of life is the objective of this study. Using the International Knee Documentation Committee (IKDC) Knee Forms Package as a study instrument, patient health-related quality of life (HRQoL) was assessed at multiple time points: first consult with the surgeon, surgery day, and any follow-up appointments. This paper presents the results from the first consult survey and surgery day survey of 76 study patients. Two subgroup analyses were conducted; one based on wait times (W2≤42 days group versus W2>42 days group) and one based on ages (â‰¤18 years group versus >18 years group). Using the two-sided t-test and a level of significance of alpha=0.025, none of the change in IKDC score values from first consult to surgery were statistically significant. Nonetheless, some trends were observed. Pain scores increased for all groups from initial consult to surgery (_IKDC>6.00 for all groups; p-value range: 0.17-0.33). Further, there was a noticeable decrease in the score for Role Limitations due to Emotional Health in the >18 years group (_IKDC= -11.38, p-value=0.18). Overall, these results suggest that patients have similar overall health and quality of life before their surgery, whether when they first meet their surgeon or on their surgery day. This awaits confirmation through a greater sample size and comparison with follow-up data.
Abstract Title
Endobronchial Ultrasound Staging of Operable NSCLC: Triple Negative Lymph Nodes May Not Require Routine Biopsy


Abstract description
Introduction: For non-small cell lung cancer (NSCLC), current staging guidelines mandate the use of CT, PET, and Endobronchial Ultrasound (EBUS) guided biopsy for assessing malignant lymph nodes. Often, these EBUS guided biopsies have a significant inconclusive yield; they necessitate a repeat biopsy and thus increased costs. Recently, a 4-point ultrasonographic score called Canada Lymph Node Score (CLNS) was developed to determine the probability of nodal malignancy in any given mediastinal lymph node. It is hypothesized that for cN0 NSCLC patients (ie. “Triple Negatives”), individual nodes with CLNS ≤ 2 do not require routine tissue-biopsy because they are likely to represent true pN0 disease.

Methods: Data was collected between August 2016 and September 2017. “Triple Negative” LNs were defined as cN0 on CT (LN≤1cm), PET (no hypermetabolic activity) and EBUS (CLNS≤2). Diagnostic analyses were conducted for various malignancy cut-off values of CLNS.

Results: 122 LNs in 58 cN0 patients were assessed. Triple Negative LNs had a specificity, NPV, and false-negative rate of 86.10% (95%CI: 78.40-91.80%), 93.40% (95%CI: 86.90-97.30%), and 6.60%, respectively when using >1 as the CLNS malignancy cut-off. Diagnostic analysis using CLNS>0 as the malignancy cut-off produced a specificity, NPV, and false-negative rate of 47.00% (95%CI: 37.60-56.50%), 91.50% (81.30-97.20%), and 8.47%, respectively.

Conclusion: As demonstrated by various diagnostic analyses, there was consistently a high NPV. Thus, at the time of EBUS, it may be possible that Triple Negative LNs do not require tissue biopsies (ie. this study is hypothesis generating), thereby saving procedural time, cost, and discomfort.
**Abstract Title**
Designing A Study To Test Online Prototype That Supports Families In The ASD Pre-Diagnostic Stage

**Author(s)** – Selvakumaran Kohilan, Anandarajan Tiffane, Gentles Stephen, Kata Anna, Prethipan Theebeha, Georgiades, Stelios

**Abstract description**
Currently, there are long wait times for children to see a developmental pediatrician for a possible Autism Spectrum Diagnosis (ASD). This can be an agonizing and isolating experience for families in the wait time period. A prototype aimed to empower and support such families, by connecting them to services, events and a community, has been created with the input of various health professionals and families. The purpose of the study is to test this prototype for its usability alongside the willingness and confidence of caregivers to use the prototype for support during the wait time period. The study has a mixed methods design consisting of a think-aloud interview coupled with a system usability scale. In addition, the eligibility criteria for the participants recruited in the study are primary caregivers of a child waiting for a possible ASD diagnosis or who has a child that has been diagnosed with ASD within 5 years. The target sample size for the study is 10 caregivers due to the feasibility in recruiting participants within the span of few months. The caregivers will be recruited through various ways, namely social media and community-oriented organizations. The study has been officially approved by the Hamilton Integrated Research Ethics Board. The next steps involve recruiting suitable participants to engage in prototype testing and interviewing them for data collection purposes. Following this, data analysis will take place and the write-up of a manuscript. Finally, the results will guide the website development needed to integrate it into the health system.
**Abstract Title**
The Feasibility of Measuring Physical Literacy

**Author(s)** – Selvanayagam Jerusha, Wahi Gita

**Abstract description**
Physical literacy is the motivation, confidence, physical competence, knowledge, and understanding needed to value and take responsibility for engagement in physical activities for life. These components of physical literacy have shown to be lower among children with obesity, suggesting that a correlation between physical literacy and childhood obesity may exist. In order to study this correlation further, the feasibility of measuring physical literacy of children with obesity in clinical settings should be assessed. As such, this study aims to determine the feasibility of measuring physical literacy among children aged 7 years or older attending the Children's Exercise and Nutrition Centre (CENC) weight management program at McMaster Children’s Hospital using the Physical Literacy Assessment for Youth (PLAY). The feasibility of measuring physical literacy will be assessed using target criteria relating to the recruitment of patients into the study, the length of time required to complete the assessment, and the capacity to conduct this assessment within a clinical setting. This study is currently being conducted and will provide insight into the feasibility of measuring physical literacy.

**Course Code**
HTHSCI 4A09
**Abstract Title**
Setting short-term and long-term priorities for enhancing equitable access to assistive technologies in Canada

**Author(s)**
Shahid Abeera, Wang Rosalie, Wilson Mike

**Abstract description**

**Introduction**
Assistive technology (AT) is used to maintain or improve the functioning of individuals of any age. Given the growing aging population in Canada, the demand for ATs is increasing while mechanisms of gaining access to them are often challenging. This study aimed to refine priorities for enhancing equitable access to ATs that could be achievable in the short and long-term, and values/principles to underpin action.

**Methods**
We interviewed 20 participants, including policymakers and stakeholders from national, provincial and regional perspectives. We sought feedback about short and long-term priorities and values/principles identified from previously held citizen panels and stakeholder dialogue. Transcripts were coded and analyzed to iteratively refine the priorities and values/principles.

**Results**
Interviewees broadly agreed with the developed priorities and values/principles. The most important short-term priorities were to adopt a common language and awareness of ATs, improve navigation services to connect individuals in need of AT with the right programs, and to create better alignment of government programs. Long-term priorities emphasized were to leverage capacity to enable rapid-learning health and social systems, build capacity among professionals involved in provision of ATs, and to address persistent inequitable access faced by specific groups. Key values identified to underpin policy action included person-centredness, equity and fairness and collaboration.

**Discussion**
The proposed priorities have the potential to support incremental changes and provide aspirational goals for fundamental changes needed to address the problem. Next steps include consulting citizens through a survey and policy symposium to determine action steps for the priorities.
**Abstract Title**
An overview of the etiology, clinical manifestations, management strategies, and complications of hypoparathyroidism from the Canadian National Hypoparathyroidism Registry

**Author(s)** – Shaikh Haniah, Alawali Yousef, El Werfalli Rafik, Alrob Hajar Abu, Braga Manoela, Tariq Farhan, Millar Adam, Punthakee Zubin, Siraj Namrah, Zariffeh Heather, Khan Tayyab S., Waldbillig Adam, Young J.E.M, Khan Aliya A.

**Abstract description**

**Objectives:**
- Identify the etiology and presenting symptoms of patients with hypoPTH.
- Evaluate current treatment practice in Canada.
- Assess differences in presentation based on etiology of the disease.
  - Compare parameters of calcium homeostasis amongst those developing complications (i.e. nephrolithiasis or nephrocalcinosis) versus patients without complications.
- Assess fracture risk in Canadian patients with hypoPTH.

**Materials and Methods:**
109 patients aged >18 years registered in the Canadian National Hypoparathyroidism Registry were reviewed as per the inclusion criteria. Etiology, clinical presentation, biochemical profile, management strategies, markers of skeletal health including fractures, bone mineral density (BMD), fracture risk, as well as complications including nephrolithiasis/nephrocalcinosis and basal ganglia calcification were reviewed.

**Results:**
- Most patients had post-surgical hypoparathyroidism.
- A substantial number of patients (33.9%) required hospitalization at initial presentation. Patients with idiopathic/autoimmune disease were twice as likely to be hospitalized compared to those with post-surgical disease.
- Nephrocalcinosis, nephrolithiasis, and basal ganglia calcification were seen despite a calcium phosphate product of <4.4 mmol/L.
  - Patients at moderate or high risk of fracture had traditional osteoporosis risk factors.

**Conclusion:**
1. HypoPTH is associated with a significant disease burden and leads to hospitalization in a large number of patients.
2. Renal complications of nephrocalcinosis and nephrolithiasis were present in 26.9% of treated patients despite maintenance of a calcium phosphate product in the desired range (<4.4
mmol2/L2). The ideal calcium phosphate product needs to be reconsidered.

3. Fracture risk was low in the absence of traditional osteoporosis risk factors.

Course Code
HTHSCI 3H06
Abstract Title
Quantifying Expression of CD206, CD68, Dectin-1, CCL-18 and XBP-1 in Scleroderma Skin Samples

Author(s)
Shaik Abdul, Veirhout Megan, Ask Kjetil

Abstract description
Scleroderma is a disease that induces fibrosis in many organs, including the skin. Fibrosis is the excessive deposit of extracellular matrix proteins (ECM) in tissue. An immune response can trigger fibrosis, including when macrophages undergo alternative “M2” activation and elicit pro-fibrotic effects. Endoplasmic reticulum (ER) stress is involved in fibrotic diseases. Following the onset of ER stress, the unfolded protein response (UPR) is initiated, where X-box binding protein (XBP-1) is cleaved into its active form. In this study, we try to quantify the expression of various M2 macrophage markers, including CD206, CD68, Dectin-1 and CCL-18, as well as XBP-1, using HALO software and compare them between scleroderma and non-scleroderma skin biopsies. The study recruited 10 study subjects that had been diagnosed in the last 5-10 years. Two subjects were healthy controls, eight subjects were scleroderma patients. 4-mm skin punch biopsies were obtained from the forearm at a standardized location, regardless of fibrotic skin score. The first biopsy was subsequently embedded in paraffin for immunostaining. Histological staining was conducted, slides were digitized and quantification Analysis was performed using HALO image analysis software. Expression of the M2 macrophage markers, including CD206, CD68, Dectin-1 and CCL18 was increased in scleroderma skin samples in comparison to control. But the difference in CCL18 expression almost reached statistical significance. This supports the role of M2 macrophages in fibrosis. Expression of XBP-1 was increased in the control group compared to the skin samples but the difference was not statistically significant.
Abstract Title
Genome-wide association study of arterial stiffness in 133,991 UK Biobank participants

Author(s) – Shi Ze (Michael), Chong Michael, Paré Guillaume

Abstract description
Arterial stiffness is a heritable biomarker that measures the elasticity of an artery and has been associated with increased risk of cardiovascular events. Current arterial stiffness GWAS are limited in size and have only been brought to light in the last decade. The present study uses a genome wide association study (GWAS) of arterial stiffness was conducted in the large UK Biobank (UKB) cohort to increase discovery of genetic loci influencing heritability of this trait. Three sentinel genome-wide significant SNPs were found to be related with arterial stiffness; rs1006923 in TEX41, rs7331212 in FOXO1 and rs872588 in COL4A2. Gene tissue expression for rs7331212 was identified to affect expression of CYCSP34 in tibial artery tissue with a P-value of 4.2 x 10^-8. The COL4A2 gene of the rs872588 SNP was previously found in literature to affect coronary artery disease, strengthening the validity of this loci. These results are relevant and promising, which warrants further investigation for targeting these genes in arterial stiffness-related cardiovascular disorders.
Abstract Title
The top-down influence of visual imagery on binocular rivalry

Author(s) – Siddhpuria Shailee, Cochrane Brett A., Milliken Bruce

Abstract description
This study focuses on the relation between mental imagery and visual perception through the phenomenon of binocular rivalry. When different colors are presented to each eye, they will compete for conscious access such that only one color is visible at a time – this is known as binocular rivalry. Chang, Lewis, and Pearson (2013) described a series of experiments demonstrating that color imagery in response to a cue influences subsequent binocular rivalry in favour of the imagined color. However, this color imagery effect was only demonstrated when the same color was presented to the same eye over the course of the experiment and using a mirror stereoscope. In Experiment 1, we modified their experiment such that each color was presented randomly between the two eyes to avoid eye bias or dominance as confounding factors. We found results trending lower than those found by Chang et al. (2013), suggesting possible influence of eye-to-color bias. In Experiment 2, we pursued the use of a cheaper, and MRI-compatible method, using prism lenses, to produce the imagery effect and found comparable results. Overall, the results suggest a top-down influence of visual imagery on conscious perception and further validate the use of alternate methods of binocular rivalry in visual imagery studies.

Course Code
HTHSCI 4A09
Abstract Title
A Review of Glomerular Diseases: Focal Segmental Glomerulosclerosis (FSGS) and Minimal Change Disease (MCD)

Author(s) – Sohi Gursharan, Romano Martin, Boll Philip

Abstract description
Purpose: Idiopathic focal segmental glomerulosclerosis (FSGS) and minimal change disease (MCD) are chronic glomerulopathies which may compromise patients’ quality of life, and for which there is no cure. This literature review aimed to summarize our current understanding of the pathophysiology, clinical characteristics and best available treatment for the two conditions in order to outline a consolidated treatment protocol and identify future research considerations.

Methods: PubMed was systematically searched by a single reviewer in order to identify primary studies pertaining to the diagnosis, treatment and classification of FSGS and MCD. Additionally, a hand search of UpToDate was conducted to glean further information about the best available evidence as summarized for clinician use. Relevant information was extracted and synthesized.

Results: Primary FSGS and MCD result from distinct pathogenic mechanisms, hypothesized to involve kidney injury via immune dysregulation. Patients require a kidney biopsy for diagnostic purposes. First-line treatment involves glucocorticoids (i.e.: prednisone), although patients’ responsiveness may be inconsistent; second-line treatment is immunotherapy.

Conclusion: This review summarized clinically-important information about FSGS and MCD, and emphasized the need for further research in the field of clinical nephrology. Large scale trials such as the Cure Glomerulonephropathy should be conducted to gather information about the affected population.

Course Code
HTHSCI 3H06
Abstract Title
Brief Intervention and Contact (BIC) Program Pilot to Manage Suicidal Behaviour: A Pilot Study Protocol

Author(s) – Soni, D., Dufort A, Sanger N., Panesar B., Shahid H., Stacey S., LaBella C., Canham S., Thabane L., Samaan Z.

Abstract description
Background: Suicide is a significant public health concern, and causes approximately 1.5% of all deaths in Canada. The most significant predictor of suicide is attempted suicide. The period after discharge therefore provides an opportunity to reconnect patients with treatment services. In particular, brief contact interventions have shown positive impacts in reducing further suicidal behaviour.

Purpose: The primary objective is to test the feasibility of implementing the Brief Intervention and Contact (BIC) protocol in a large trial. Secondary objectives include exploring whether the addition of BIC decreases suicidal behaviour, reduces depressive symptoms, improves social connectivity, and reduces further ER visits, compared to usual treatment after 6 months of follow-up.

Methods: We aim to recruit 30 patients in each arm. The intake and follow-up questionnaires gather data on sociodemographic variables, recruitment rate, data completion, participant retention, and changes in clinical indicators of mood and well-being (BDI-II, SSTS, WWI, TAS, PSIS, BHS, Bille-Brahe Social Support Scale, SSQ-short form). The pilot study will be conducted over 6 months, with a total of 9 follow-up contacts through calls or text messages in the intervention group.

Results: Data exploration will be performed to compare the mean difference of the BDI-II, the Bille-Brahe Social Support Scale, the SSQ, number of ER visits, and suicide re-attempts, between intervention and comparator groups using t-test, and within groups for repeated measures using ANOVA.

Clinical implications: The pilot study will show if the brief contact and intervention program is feasible to be delivered at the planned frequency and duration.

Acknowledgement: The pilot study is supported by a $5000 grant from the Suicide Prevention Community Council of Hamilton.

Course Code
HTHSCI 4A09
Abstract Title
Impacts of diabetes management education on self-management scores and progression of diabetic retinopathy

Author(s) – Sothivannan Amirthan, Qian Jenny, Chaudhary Varun

Abstract description
Diabetes mellitus (DM) represents a major public health concern. Diabetic retinopathy (DR), its primary microvascular complication, is a leading cause of vision loss in industrialized nations. Education and support programs to promote self-management have become standard in clinical practice guidelines; however, their impact on patient understanding of DR and DR-associated risk factors is not clear. Moreover, a lack of health literacy continues to be a major issue in promoting patient adherence to treatments and self-management of diabetes. This study seeks to determine the effectiveness of a diabetes education program in Hamilton, Canada in improving health literacy and self-management of DM.

A survey of the literature on key pathogenetic and pathophysiological characteristics of DM and DR, the impact of DM and DR worldwide and in Canada, and the status and questions surrounding diabetes self-management education and support programs revealed that diabetes education programs may assist in empower individuals to better self-manage DM and control risk factors implicated in DR pathogenesis and progression of DM. Nonetheless, there remains a need for further research to better understand the contribution of HbA1c variability to risk of DR, the differential effect of diabetes self-management education and support on long-term clinical complications and biomarkers of disease control, and the role of diabetes self-management education and support on later onset and severity of DR. The study team is currently validating their knowledge assessment questionnaire, and will begin recruiting study participants in Spring 2019.

Course Code
HTHSCI 4A12
Abstract Title
Effects of Music Therapy on Pediatric Postoperative Distress

Author(s) – Sung Jihyun, Brittain Bonnie, Finnerty Rachael

Abstract description
Music therapy (MT) is clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by an accredited music therapist. Interventions include songwriting, lyric analysis, physiological entrainment, and singing. MT is increasingly being used for surgical settings, as it shows to decrease distress (ie. pain, anxiety) associated with surgery. This is consequently known to decrease number of hospitalization days and analgesics, which has economic potential. However, there is little literature exploring the effects of MT regarding pediatric surgery. Furthermore, there is often confusion and lack of distinction between music medicine (MM), which is passive music listening, and MT. Frequently the two are incorrectly used interchangeably. Although MM also has healthcare benefits, it is distinctively different from the client-centred, therapeutic nature of MT. In this literature review, the effects of postoperative MT interventions on physiological markers, pain, anxiety, and depression of pediatric surgical patients were examined. After the literature review showed that despite the positive, significant outcomes, there is a lack of rigorous research done on this topic, we designed a pilot study proposal to further investigate. The pilot will launch in McMaster Children’s Hospital and study the effects of postoperative MT and MM on pediatric patients’ pain and anxiety after undergoing invasive surgeries. In conclusion, although MT seems to have positive effects on pediatric patients’ physiological and psychological distress from invasive surgeries, due to the limited number and rigour of current studies, there needs to be further studies to fully explore its effects.

Course Code
HTHSCI 4C15
Abstract Title
Tissue Engineered Small Intestine-on-a-Chip

Author(s) – Su Hsuan-Ming (Jack), Rahmani Sara, Verdu Elena F, Didar Tohid F.

Abstract description
Here, we have integrated microfluidic technology, intestinal organoid culture system, and intestinal decellularization techniques to regenerate native small intestine in vitro. In our design, the mouse small intestine served as a microfluidic channel itself. By doing so, we have rendered the decellularization and recellularization processes in-situ, and thus, inherently more feasible. The decellularization process was carried out over 3 days by continuous perfusion of detergent within the small intestine. This process removed intestinal epithelium cells, cellular debris, and other antigenic components. Intestinal organoids were then seeded onto this acellular intestinal scaffold, with their growth and differentiation monitored through immunofluorescence staining. This work bridges the gap between tissue regeneration and whole-organ fabrication by establishing a facile technique to precisely regenerate native small intestine.
**Abstract Title**
An Assessment of Pharmacist’s Perspectives on the Barriers to Influenza Immunization in the Niagara Region – A Descriptive Study

**Author(s)** – Swanson Michael, Lof Pam

**Abstract description**
Since pharmacists have been permitted to administer any ages 5+, surveillance measures have consistently found this avenue to influenza vaccination to be lacking in Ontario. Niagara influenza immunization data from 2017-2018 further revealed this observation. Moreover, pharmacies were found to have administered alarming few vaccinations, especially among children (5-17 years of age). This study was a descriptive survey of pharmacists in the Niagara region, pertaining to their attitudes of administering flu vaccinations as well as their perceptions of the barriers to flu vaccination at the pharmacy. Additional topics covered by the survey included: promotional methods, viewpoint on the service, working municipality, and years engaged in the program. The survey had a response rate of 44% (62/141). The survey found the majority of participating pharmacists have positive attitudes towards administering flu vaccinations and the importance of receiving a flu vaccine. Reported barriers to vaccination at the pharmacy for all ages for all ages included 1) patient fear of adverse events, 2) inadequate patient understanding of the importance of vaccines, 3) awareness of the service. Accordingly, for children the most commonly reported barriers were 1) fear of getting shots, 2) age restrictions for children under 5 preventing parents bringing older children, and 3) children do not attend the pharmacy. This survey indicated the primary problem point relates to awareness and understanding of the service and the importance of influenza immunization. These results hold heavy implications for future Niagara Region health promotion practice.
Abstract Title
Cost-effectiveness of cell saver use in posterior instrumented scoliosis correction in a paediatric population.

Author(s) – Tadros Marcorios, Thornley Patrick, Peterson Devin

Abstract description
Posterior spinal instrumentation and fusion surgery in adolescent patients is characterized with the possibility of drastic intraoperative blood loss, which often needs to be compensated for through allogeneic blood transfusions. Recently, intraoperative cell saver use has been frequently adopted; however, its efficacy and cost-effectiveness have yet to be appropriately confirmed. This study consequently aims to determine the efficacy and cost-effectiveness of intraoperative cell saver use. A total of 176 adolescent patients were enrolled in this single-center, retrospective study. These patients underwent posterior spinal instrumentation and fusion surgeries between August 2008 and August 2018. Only 12 patients did not use the cell saver intraoperatively, the remaining 164 patients did use cell saver. A propensity score was used to create matched case-control pairs based on possible confounders in baseline characteristics. Allogeneic red blood cell (RBC) transfusions as well as cell saver costs were analyzed. All 12 patients in the control group were appropriately matched. Preliminary data (prior to matching) showed that compared to the control group, the cell saver group had significantly fewer intra- and post-operative allogeneic RBC transfusions, \( P = 0.608 \) and \( P = 0.815 \) respectively. With respect to the total cost of transfusion of blood products, costs for the control group were significantly lower than those of the cell saver group (\( P < 0.05 \)). The use of the cell saver in posterior spinal instrumentation failed to decrease total allogeneic RBC transfusion rates, and therefore is not considered to be cost-effective, according to the preliminary results.

Course Code
HTHSCI 4A15
Abstract Title
Commentary: Exploring Mental Health Status and Syndrome Patterns Among Young Refugee Children in Germany

Author(s) – Tahir Talha, Damer Alameen, Wong Michael

Abstract description
The worldwide refugee crisis has given rise to 16.2 million refugees in 2017 alone, 52% of which were children; yet, there is a dearth of information on the mental health status of these children. Büchmuller et al. analyzed mental health patterns in Syrian and Iraqi refugee children aged 1.5-5 years, who recently arrived in Germany. Two studies were conducted: the first used the Child Behavior Checklist (CBCL) to examine child mental health as reported by a parent; the second, conducted on a separate sample, used the Caregiver Teacher Report Form (CTRF) to assess child mental health as reported by teachers. When compared to clinical reference data of U.S. children, refugee parents reported elevated levels of anxiety/depression, attention problems and withdrawal behavior in their children. Reports by teachers showed elevated levels of mental health problems in refugee children when compared to U.S. norms, but not when compared to clinical reference data. Elevated CBCL problem scores among refugee children, may have been the product of maternal psychopathology and low education present within the parental sample. Moreover, the disparity observed between the CBCL and CTRF scores may simply be the result of intrinsic disagreement between the two instruments instead of measurable differences in psychopathology. Despite these potential limitations, studies of this nature are nevertheless important to analyze mental health within child refugee populations and meet their needs with tailor-made clinical interventions.

Course Code
HTHSCI 3H03
Abstract Title
Primary and Secondary Prevention Interventions for Lung Cancer and Breast Cancer in China: A scoping review on what China has done and how to do better

Author(s) – Tang Yingyue, Wenhui Mao, Shenglan Tang

Abstract description
Background:
Cancer is the leading cause of mortality in China. Breast cancer and lung cancer are the most commonly diagnosed cancers in female and male in China respectively, with annual incidence rates of 41.32/100,000 and 67.71/100,000. This scoping review aims to summarize the current process of primary and secondary prevention interventions for lung cancer and breast cancer and to explore how China can do better.

Methods:
We searched four English databases (MEDLINE, EMBASE, CINAHL and Web of Science) for articles published in 1990-2018. Inclusion criteria were: 1) adult population in China, 2) focused on breast cancer or lung cancer, 3) demonstrated progress in primary or secondary prevention, 4) published in English and Chinese. Key search terms included lung cancer, breast cancer, health education, smoking, screening, and self-examination.

Results:
The preliminary analysis included 21 eligible studies on breast cancer prevention published in English. Included studies are cross-sectional (n=16), RCT (n=4) and cohort (n=1) of study design; they focused on screening participation (n=7), knowledge and awareness (n=2), population-based screening (n=2), risk-based screening (n=1), primary prevention (n=7) and secondary prevention interventions (n=4). Studies showed poor awareness of breast cancer and low screening coverage in China. Compared to international guidelines, the Chinese National Breast Cancer Screening Program has an earlier starting age, lacks appropriate screening frequencies and does not provide mammogram for all women.

Conclusion:
China faces challenges with implementing effective breast cancer prevention strategies. Areas for future research include education programs to increase awareness and examining effectiveness of various screening strategies in Chinese context.

Course Code
HTHSCI 4G06
**Abstract Title**
“Talk Differently”: A Qualitative Study of the Exposure to Improv for Educational Workshop Leaders

**Author(s)** – Thakar Swarni, Jafine Hartley

**Abstract description**
Improv (improvisational theatre) training has been shown to build empathy and communication skills in various settings. However, there is limited evidence on the value of improv training for the effective presentation of educational material. The primary objective of this qualitative study was to understand the experience of an improv training session for McMaster Children and Youth University (MCYU) workshop leaders and its impact on the development and delivery of their educational workshops for Hamilton youth. 115 MCYU volunteers participated in an improv session prior to development of their workshops. After presenting their workshops in the community, leaders were asked to complete online questionnaires (n=14) and semi-structured interviews (n=6) about their experience, value, skills developed/improved, and interest regarding the improv session. A preliminary analysis revealed that almost all research participants learned something new about themselves or about communication, found improv valuable, and developed at least one skill related to education/communication. Most participants agreed that the improv session positively influenced the quality of their workshop to some degree. 65% of participants demonstrated interest in participating in a future improv session. There were certain limitations to obtaining complete, accurate information from some participants as questionnaires and interviews were conducted 4-5 months after the improv session. Future studies should evaluate the perspective of youth engaging in these workshops to understand how their learning experience is influenced by providing improv training to workshop leaders. To confirm our findings, future studies should also assess long-term effects of consistent improv training for educators on a wider scale.

**Course Code**
HTHSCI 3H06
Abstract Title
Myostatin Contributes to Type 1 Diabetes Myopathy

Author(s) – Tin Enoch, Dial Athan G., Monaco Cynthia M.F., Grafham Grace, Hawke Thomas J.

Abstract description
Myostatin, a negative regulator of muscle growth, has been implicated in several muscle-wasting diseases. Type 1 Diabetes (T1D) is a chronic health condition caused by the autoimmune destruction of insulin-producing pancreatic β cells, leading to hyperglycemia and hypoinsulinemia. Recent studies have observed physiological irregularities in skeletal muscle health of patients with T1D. However, the understanding of myostatin in T1D muscle health is limited to animal studies with unclear mechanisms of myopathy. As a result, we examined the expression and effects of myostatin as a potential mediator of T1D myopathy. This study observed young adults with and without T1D. Secondly, we used the Ins2−/− Akita mouse model (Akita) of T1D to further examine skeletal muscle during the disease. Serum myostatin expression was measured using ELISA, while muscle myostatin expression was quantified using western blot. Among individuals with T1D, we observed elevated active (p=0.12) and propeptide (p=0.26) muscle myostatin, along with a significant increase in serum myostatin (p < 0.05). Elevated myostatin was correlated with markers of poor metabolic health. Specifically, active myostatin positively correlated with body fat percentage (R² = 0.33, p < 0.05) while negatively correlated with oxidative proteins (R² = -0.11, p = 0.16). Together, our data suggests myostatin may contribute to the myopathic phenotype of T1D. Ultimately, our work strives to understand the involvement of myostatin in muscle health during T1D, and eventually provide a potential therapeutic target for T1D treatment.
Abstract Title
Evaluating the Impact of Virtual Reality Laboratory Simulations on Learning Outcomes and Motivation

Author(s) – Tsirulnikov Danielle, Vulcu Felicia, Mullarkey Caitlin

Abstract description
Gamified interventions offer an exciting and untapped potential to improve students’ experience and learning in the classroom setting. Previous studies on the integration of gamified interventions in education have demonstrated improved learning outcomes, test scores, and motivation as compared to traditional teaching methods. McMaster is one of the first universities to spearhead a novel initiative in partnership with Labster (a technology-enhanced learning start-up) and Google to introduce 3D virtual laboratory simulations. The aim of this study is to test whether virtual reality (VR) simulations enhance theoretical knowledge and is motivational to students. To investigate this, 39 undergraduate students were tasked with completing a pre-quiz, a VR lab simulation, a post-quiz, and a survey. The results demonstrate an 18% increase in learning outcomes, and results from the survey show that 94.7% of students agree that VR technology should be utilized more in teaching.

Course Code
HTHSCI 3H06
**Abstract Title**
Supporting Healthy Sexual Expression in Individuals with Acquired Brain Injury: Barriers & Facilitators

**Author(s)**—Twomey Meghan, Kelecevic Julija

**Abstract description**
Background: Significant changes to one’s sexuality may occur following acquired brain injury (ABI). Therefore, open discussions between health professionals and patients with ABI is crucial in addressing sexual issues that may result. However, barriers and facilitators to supporting healthy client sexual expression is an understudied topic for persons with ABI.

Objectives: To explore rehabilitation provider’s comfort levels, professional training, and attitudes towards the sexuality of individuals with ABI.

Methods: An online survey composed of 22 questions was distributed to employees of Brain Injury Services Hamilton and Mind Forward Brain Injury Services.

Results: The sample consisted of 30 health professionals. The majority of participants had either taken a course on human sexuality (36.67%) or sexuality issues specifically in neurological injuries (36.67%). Fifty percent discuss sexuality with some clients, but only if they are approached about the topic. Approximately 77% feel comfortable discussing sexuality with clients, although lacking sufficient knowledge was a primary reason for not discussing sexuality or feeling uncomfortable (43.33%). Participants on average had a positive attitude towards sexuality and ABI and indicated that additional training in several areas would be valuable in helping them address clients’ sexual concerns.

Conclusions: Rehabilitation providers at the participating agencies believe that sexuality is essential to the overall health of clients with ABI. Frequently, staff take a reactive approach in responding to clients’ sexual concerns, and additional training in several areas related to sexuality and ABI would be valuable to staff to identify and respond to clients’ sexual concerns effectively.
Abstract title
The Dectin-1 receptor in fibrogenesis as initiated by alternatively activated macrophages

Author(s) – Walker H., Ask K.

Abstract description
Background: In wound healing, chronic deposition of extra-cellular matrix by myofibroblasts leads to fibrosis development, which interferes with tissue function. Macrophages can be polarized to different phenotypes by cytokines during tissue repair. Pro-fibrotic (M2) and hyper-M2 macrophages contribute to fibrogenesis through production of factors including TGF-B, which differentiates fibroblasts to myofibroblasts. Dectin-1 is a non-TLR found on macrophages. Recent research suggests that inhibition of Dectin-1 and its signalling through SYK is protective against certain types of fibrosis.

Objectives: To use THP1 derived macrophages to investigate the effects of pSYK inhibition on the pro-fibrotic phenotype. In the murine model, to investigate the impact of Dectin-1 knock-out on fibrogenesis.

Methods: THP1 derived macrophages were polarized to the desired phenotypes and then treated with a range of pSYK inhibitor concentrations. CCL18 ELISA was used to measure the level of fibrotic activity for each phenotype after treatment. Macrophages were also derived from the bone marrow (BMDMs) of wild-type and Dectin-1 KO mice. Treatment with cytokines was followed by lysing of the macrophages and arginase assay to measure fibrotic activity of each phenotype for WT and KO.

Results: Treatment with pSYK inhibitor significantly reduced CCL18 production at concentrations as low as 1uM in M2 cells, and 100nM in hM2. For the BMDMs, arginase production of both phenotypes was significantly greater for the Dectin-1 KO cells than the WT.

Conclusions: Both interventions sought to inhibit the Dectin-1-PSK pathway, and despite having seemingly opposite effects, it is evident that the pathway may be implicated in fibrogenesis.

Course Code
HTHSCI 4A12
**Abstract Title**
Mucosal Healing in Pediatric Celiac Disease 3-5 Years After Diagnosis

**Author(s)** – Viner Courtney, Brill Herbert

**Abstract description**
Background: Approximately 30% of patients with celiac disease still have villous atrophy 1-2 years after diagnosis. It can take up to 2 years for the majority of patients' tissue transglutaminase levels to normalize and serologic tests do not always correlate with tissue healing.

Aims: This multicenter prospective cohort study is meant to determine the potential correlation between adherence to a gluten-free diet and resolution of villous atrophy 3-5 years after being diagnosed with celiac disease. The primary objective of the study is to compare mucosal healing rates of subjects with excellent adherence to the gluten-free diet with subjects who have other than excellent adherence. The secondary outcome measures include tissue transglutaminase levels, ferritin and hemoglobin levels, urine/stool gluten immunogenic peptides and their correlation with mucosal healing prevalence. The Registered Dietician's assessment of adherence, socioeconomic status, and quality of life scores will be compared to levels of mucosal healing.

Methods: Subjects recruited will fill out the Celiac Disease Adherence Test (CDAT) and Celiac Disease Quality of Life Measure (CD-QOL). Subjects will have standard bloodwork done, and be tested for HLA-DQ2 and/or HLA-DQ8 genotypes, if not done previously. Patients will be instructed to perform a Glutenostics twice in the week leading up to endoscopy. Subjects will then undergo endoscopy, with 6 biopsies in the duodenum evaluated in a blinded way by a Gastroenterologist and Pathologist to determine Marsh grading.

Progress: The protocol has been developed, the consent forms and script were written, and REB submission is underway.

**Course Code**
HTHSCI 3H06
Abstract Title
Understanding the Development of Regulatory B Cells by Evaluating Next Generation Single Cell Analyses: A Literature Review

Author(s) – Visva Samantha, Oliveria John Paul

Abstract description
There is very little research concerning human regulatory B (Breg) cells and this may in part be due to inconsistencies in phenotype across species (murine models are typically used) and suppressive modalities (ex. IL-10, TGF-β). The purpose of this critical review is to examine our current understanding of Breg cell development, such as time points of differentiation, and how computer modelling can improve our understanding. Specifically, bioinformatic analysis of the changes in cell surface markers and signalling molecules can help guide our understanding of the timing of cell-fate decisions and Breg differentiation. Bregs have been implicated in many neurodegenerative diseases such as Multiple Sclerosis and the use of bioinformatics and in silico methods may lead to a greater understanding of its role in disease, as a putative Breg trajectory may aid in tracking changes in disease progression.

Course Code
HTHSCI 3H03
Abstract Title
Assessing land use impacts in mussels in the Saint John River with mercury and stable isotopes

Author(s) – Weir Ellie M., Lippert Emma L., Curry R. Allen, Kidd Karen A

Abstract description
The Saint John River (SJR) is a prominent feature of Atlantic Canada. Along its length, the SJR supports many diverse aquatic communities, as well as a population of over 500,000 people and a number of different industries. In recent years, increased attention has been focused on point and non-point sources of chemical contamination. Elevated mercury concentrations are of particular concern since mercury is known to bioaccumulate in tissues and biomagnify across trophic levels, causing adverse health effects in aquatic and terrestrial organisms. The present study utilizes mussels to evaluate mercury (THg) concentrations and stable isotope (SI) values at 23 sites to assess how land use may result in spatial variability and to identify specific sites which may pose a risk to wildlife. To control for confounding variables, Eastern elliptio and Eastern lampmussels were included according to a length range of 7.2-8.2 cm. Significant differences were observed across sites, with sites associated with the Mactaquac dam having notably high mercury concentrations. Of the 23 sites, 7 exceeded the tissue residue guidelines for mink, a predator species of freshwater mussels. To investigate the effect of length on mercury accumulation, a broader range of lengths were selected from sites 14, 28 and 34; no significant relationship was observed between mussel length and mercury concentration. $^{13}$C depletion and $^{15}$N enrichment occurred along the SJR, with significant differences between upstream and downstream regions for both $^{13}$C and $^{15}$N, coinciding with increased agricultural and urban land use.

Course Code
HTHSCI 4A09
Abstract Title
Does bone-targeted therapy benefit patients with metastatic renal cell carcinoma?

Author(s) – Wong Emily, Kapoor Anil

Abstract description
Introduction
In metastatic renal cell carcinoma (mRCC), bone is the second most common site of metastasis and is associated with increased morbidity and poorer quality of life. Bone-targeted therapies (BTTs) such as denosumab and zoledronic acid may prevent skeletal-related events. However, the benefit of BTTs in combination with tyrosine kinase inhibitors (TKIs) remains unclear.

Methods
We performed a retrospective chart review at the Urologic Cancer Centre for Research and Innovation. Patients with mRCC were included if they had bone metastases treated with TKIs between 2010 and 2017. Our primary outcome was overall survival (OS), defined as the time elapsed from mRCC clinical diagnosis to death, and modelled using the Kaplan-Meier method. Secondary outcomes included the analysis of prognostic factors of OS using Cox proportional hazards regression.

Results
In total, 230 patients with mRCC were identified, of which 46 had bone metastases treated with TKIs and were included (TKI-only, n=37; TKI+BTT, n=9). In the TKI+BTT cohort, patients received either denosumab (n=5) or zoledronic acid (n=4). At the time of analysis, 63% of patients were deceased. We observed an OS trend favouring the TKI+BTT cohort [13.8 months (95% CI: 12.3-15.2) vs. 29.6 months (95% CI: 7.2-51.9), HR: 1.66 (95%CI: 0.62-4.45), p=0.31]. Age, gender, comorbidities, IMDC prognostic group and pathologic tumour grade were not significant predictors of worse OS on univariate or multivariate analysis. Pathologic stage 3 or 4 was an independent predictor of worse OS (HR: 5.8, 95% CI: 1.41-24.03, p=0.015).

Conclusion
BTTs may have a continued role in the era of targeted therapy and immunotherapy.

Course Code
HTHSCI 4A15
Abstract Title
Assessing quality of life instruments for patients with nasal polyposis: a systematic literature review

Author(s) – Wong Melanie, Keith Paul K.

Abstract description
Background
Nasal polyposis is an inflammatory chronic disease of the upper respiratory tract that significantly impacts quality of life (QoL) and daily functioning. Many QoL measurement instruments for nasal polyposis patients exist; however, it is unclear whether the most disease-specific instrument is currently in use.

Objective
This systematic review aims to assess the health-related QoL instruments in psychometric validation studies involving nasal polyposis patients and critically evaluate the quality of the measurement properties of these patient-reported instruments.

Methods
A systematic literature review was conducted in the Ovid MEDLINE, Embase, and Cochrane CENTRAL databases to identify all original validation studies that assessed quality of life instruments in nasal polyposis patients. The quality of each instrument was evaluated following the COSMIN checklist.

Results
A total of 8 validated QoL instruments for nasal polyposis patients were identified, with the most commonly-used and well-established tool in the literature being the 22-Item Sino-Nasal Outcome Test (SNOT-22). Significant inconsistencies were noted in the way that measurement properties were developed and reported. Following quality assessment, three instruments scored positive for at least four of the six measurement properties, including the SNOT-22.

Conclusion
None of the validation studies focused exclusively on nasal polyposis patients; 3 studies grouped them with chronic rhinosinusitis patients without nasal polyposis, while the remaining five studies did not specify the patient demographics, creating challenges in understanding whether the tools are truly specific for nasal polyposis subjects. Therefore, we recognize the need for a more disease-specific instrument, as it may be more valuable in improving clinical decision-making.
Abstract Title
Prospective symptomatology of post-concussion syndrome (PCS)

Author(s) – Wu Anqi, Gambale Teresa, Malik Shazia, Khan Shaji, Nam Rosemary, Middlemiss Pamela, Parkinson William, Rathbone Michel P.

Abstract description
Mild traumatic brain injury (mTBI), also known as concussion, involves a physiological disruption of brain functions due to head trauma or brain acceleration. Post-concussion symptoms often include physical/somatic symptoms, cognitive deficits and behavioural/emotional changes. Up to 44% of mTBI patients show incomplete long-term functional recovery after 6 months and post-concussion syndrome (PCS) may occur in 10-25% of mTBI cases. However, post-concussive symptoms are often non-specific and may not differ reliably from trauma controls.

Thus, the purpose of this prospective study is to clarify the differences in symptoms between those who have sustained a concussion and those who have not. It can be hypothesized that those who have sustained a concussion will present with more physical, cognitive and/or emotional symptoms compared to those who have not due to diffuse axonal injury and cerebral microvascular disruptions causing neurological impairment and neuroinflammation.

Data was collected through a survey administered to patients following their clinical assessment at a concussion clinic. Participants were included if they: 1) were between the ages of 19-55 and 2) had no structural damage assessed through CT. Patient demographics, possible predictive factors, concussion characteristics, mechanism of injury and post-concussion symptoms were collected. Currently, 90 participants have been recruited, with the aim of 200 participants in total. Going forward, a data audit will be performed, followed by an interim data analysis to determine the percentage of participants with concussion, differences in symptomatology through cluster analysis and the predictive potential of demographic and injury mechanism information.
Abstract Title
Investigating the Proteolysis of ADAMTS13 by Activated Coagulation Proteins

Author(s) – Wu Christine, Kretz Colin

Abstract description
Upon vascular injury, hemostasis is initiated to maintain blood in a fluid state and minimize blood loss from damaged blood vessels through clot formation. Von Willebrand Factor (VWF) is a large, multimeric glycoprotein (310 kDa) that plays an important role in initiating formation of the primary platelet plug by capturing circulating platelets to the site of vessel injury. VWF multimeric size and platelet-tethering function is regulated by a zinc metalloprotease named ADAMTS13. ADAMTS13 (180 kDa) is secreted as a constitutively active protease with a long half-life of 2-3 days and has no identified physiological inhibitors. Interestingly, the serine proteases plasmin, thrombin, and FXIa have been shown to proteolyze ADAMTS13 and impair its VWF-cleaving function under static conditions. We hypothesized that these and other circulating plasma proteins may play a role in maintaining the balance between hemostasis and thrombosis upon endothelium injury by regulating ADAMTS13 function and activity through proteolysis. ADAMTS13 was incubated with a host of activated coagulation proteins to assess for potential cleavage. Our results indicate that FXa also proteolyzed ADAMT13, producing a similar cleavage pattern to thrombin. Currently, samples of cleaved-ADAMTS13 by plasmin, thrombin, FXa, and FXIa are undergoing N-terminal sequencing to determine their specific cleavage sites. We intend to further perform cleaved-ADAMTS13 activity assays with VWF peptides to assess for impaired VWF proteolysis. As these proteases circulate in high concentrations alongside VWF and ADAMTS13 at sites of vessel damage, they may serve as regulatory mechanisms to enhance VWF activity and thrombus growth while impairing ADAMTS13 function.
Abstract Title
Role of NEMP1 in Ovarian Function

Author(s) – Wu Winnie, Jurisicova Andrea

Abstract description
The double layered nuclear envelope (NE) encloses and protects the eukaryotic nucleus, and disruption of the NE can lead to many diseases. A transmembrane NE protein, NEMP, binds to other domain proteins to maintain mechanical stability in the nucleus. Previous studies have shown that NEMP-/- animals are viable, but are found to exhibit splenomegaly, anemia, as well as reduced breeding patterns. Here, we use murine models to investigate the role of NEMP in female fertility. Histologic analysis demonstrates that loss of murine NEMP results in a significant reduction in the primordial follicle pool, suggesting that NEMP has a significant effect on ovarian reserve. Immunohistochemistry shows that aging decreases the expression of NEMP localized to the nuclear envelope, and that null mice exhibit chromatin packaging abnormalities. A reduced ovarian reserve in humans is believed to lead to premature menopause, and thus the loss of NEMP could be a cause of premature ovarian failure.
Abstract Title
Validation of the 13-item Pain Stages of Change Questionnaire (PSOCQ-13) in a pediatric chronic pain clinic

Author(s) – Xie Kathy, Elik Nez, Hapidou Eleni G.

Abstract description
Introduction/Aim: The Pain Stages of Change Questionnaire (PSCOQ) is used in adult chronic pain assessment to determine readiness to develop a self-management approach. While this measure has been well-established, there lacks a version that is applicable to youth. As chronic pain can severely impact quality of life, developing an adolescent PSOCQ may have significant clinical implications. This study provided initial validation of the recently developed 13-item adolescent PSCOQ (PSOCQ-13) by Guite and her colleagues. Methods: Youth aged 10-18 (n=19) enrolled in the Pediatric Chronic Pain Program at McMaster Children’s Hospital completed a set of intake questionnaires including the PSOCQ-13, Chronic Pain Acceptance (CPAQ), Pain Self Efficacy (PSE), and Pain Coping (PCQ). Tests for internal reliability and concurrent validity of PSOCQ-13 were performed using the Statistical Package for Social Sciences (SPSS) Version 25. Results: Good inter-item reliability was obtained for Pre-contemplation (α =.83) and Action/Maintenance (α =.90), but not for Contemplation (α =.48). Significant positive correlations were found between Action/Maintenance and Problem Solving (PCQ) (r=.64), Contemplation and Internalizing (PCQ) (r=.69), and Contemplation and Approach (PCQ) (r=.46). In addition, factor analysis demonstrated that the PSCOQ-13 items loaded correctly into their corresponding subscales, with the strongest factor being Action/Maintenance, followed by Pre-contemplation and Contemplation. Discussion: Results support the use of the 3-factor model for the PSOCQ-13. Concurrent validity of the PSOCQ-13 with other measures is weak and indicates need for further modification. Research into developing an adolescent PSOCQ will benefit from a larger sample size, closer examination of test-retest reliability and outcomes of interventions, as well as improvements to the Contemplation subscale.
Abstract Title
Preserving Drugs Efficacy during Nano-Encapsulation

Author(s) – Xu Chenchen, Gonzalez Azucena, Hosseinidoust Zeinab

Abstract description

Antibiotics, in general, are highly sensitive to elevated temperatures and temperature fluctuations, sometimes degrading during prolonged incubation even at physiological temperatures. Liposomes are attractive vehicles for encapsulation and localized delivery of antibiotics, but the liposomal preparation and encapsulation process involves numerous cycles of freeze-thaw as well as heating/sonication steps, all of which can potentially deactivate or degrade antibiotics. We investigate the extent of antibiotic deactivation during the liposomal preparation method, using two different glycopeptide antibiotics commonly used for Staphylococcus infections, namely vancomycin hydrochloride and teicoplanin. Both antibiotics, in the non-encapsulated state, were found to be sensitive to the freeze-thaw/sonication steps involved in the liposomal preparation methods; vancomycin completely lost efficacy after three cycles of freeze-thaw, and teicoplanin lost efficacy after 20 minutes of sonication. However, this effect was significantly mitigated when the antibiotics were encapsulated in liposomes, with the released vancomycin showing full potency against bacterial cultures of Staphylococcus aureus and teicoplanin only showing a small decrease in activity. Differential Scanning Calorimetry of liposomes and mass spectrometry suggest that liposomes had a protective effect on the encapsulated antibiotic. The protective effect of lipid vesicles towards the antibiotics potentially serves as an additional advantage or antibiotic encapsulation, increasing their half-life in the body. And mitigating the need for frequent administration of highly temperature-sensitive drugs.
**Abstract Title**
Implementing Feedback and Support for Parent-Identified Goals for Children with Autism Spectrum Disorder

**Author(s)** – Yang Chia Hua (Emily), Zhang Wenyue (Alissa), Kata Anna, Georgiades Stelios

**Abstract description**
Not available

**Course Code**
HTHSCI 3CH6
Abstract Title
Determining the comparative association between health disorders and school readiness using the Early Development Instrument

Author(s) – Yusuf Ibrahim, Reid-Westoby Caroline, Janus Magdalena

Abstract description
Background: Children with health disorders have an increased susceptibility to mental health issues, heart disease, obesity, and criminality. Compared to their typically-developing peers, the presence of a health disorder can lead to a reduction in a child’s readiness for school. Although a plethora of literature discusses this association, little is known about how different categories of health disorders impact children’s school readiness.

Purpose: The purpose of the current study was to examine the developmental health of children with various types of health disorders (i.e. mental, developmental, speech/language, sensory, and motor) compared to children without these disorders, using the Early Development Instrument (EDI), and to compare developmental health outcomes in children with different disorders.

Methods: Data came from the Canadian Children’s Health in Context Study (CCHICS) database collected from 2010 to 2015. The study population consisted of 576,294 kindergartners, of which 29,705 (5.2%) were diagnosed with a health disorder. Scores on the five domains of the EDI were the main outcome variables. A total of five multiple analyses of covariance (MANCOVAs) were conducted, to compare EDI scores between children with and without the five disorder categories, controlling for children’s age, sex, and neighbourhood-level SES.

Results: Children without mental, developmental, speech/language, sensory, and motor disorders scored significantly higher (p< 0.001) on every domain compared to children with the respective disorders (Wilks’ λ=0.981, F(5, 567046)=2165.401, partial η2 =0.19; Wilks’ λ=0.936, F(5, 567046)=7753.106, partial η2 =0.64; Wilks’ λ=0.973, F(5, 567046)=3145.006, partial η2 =0.27; Wilks’ λ=0.998, F(5, 567046)=261.045, partial η2 =0.02; Wilks’ λ=0.990, F(5, 567046)=1128.722, partial η2 =0.10, respectively). Amongst children with disorders, some disorders showed specificity (e.g.children with motor disorders scored lower on the physical domain, compared to children with other disorders) this was not the case for all disorders.

Conclusions: Study findings show that in kindergarten children, the presence of a health disorder is associated with decreased school readiness. While some disorders showed specificity that was not the case for all of them. Children with some types of disorders scored lower overall compared to children without the respective disorder. These findings suggest that early interventions should focus on development as a whole, and not necessarily focus on the specific aspects of development directly related to the disorder.

Course Code
HTHSCI 4C15
Abstract Title
Intravenous Acetaminophen vs Placebo in Post-bariatric Surgery Pain Management: Meta-
analysis of Randomized Controlled Trials

Author(s) – Yu James, Lee Yung, Doumouras Aristithes G., Ashoorion Vahid, Gmora Scott, Anvari
Mehran, Hong Dennis

Abstract description
Not available

Course Code
HTHSCI 4D03
Abstract Title
Impact of Arthroscopic Superior Labral Anterior-Posterior (SLAP) Repair on Return to Sport Outcomes: A Systematic Review

Author(s) – Yu James, Thayaparan Aarabi, Horner Nolan S., Leroux Timothy, Alolabi Bashar, Khan Moin

Abstract description
Not available

Course Code
HTHSCI 4W03
Abstract Title
Update on the genetic variants associated with diabetes subtypes

Author(s) – Yu W., Meyre D.

Abstract description
Diabetes is a group of metabolic diseases characterized by hyperglycemia in response to defects in insulin secretion from pancreatic β-cells, insulin action on tissue, or both. Chronic hyperglycemia of diabetes is associated with long-term damage to many organs and predisposes a wide range of complications, including cardiovascular disease and stroke. The evolution of technologies such as genome-wide genotyping arrays has facilitated the identification of many genes associated with diabetes. While many reviews exist, there has yet been an exhaustive summary of genetic loci for all diabetes subtypes. Thus, recent high-impact reviews and primary research studies on diabetes subtypes were included in our analysis, excluding diabetes syndromes as they were recently summarized in an ongoing review. Our search yielded identification of many genetic variants associated with various diabetes subtypes. Identification of genes predisposing to several diabetes subtypes enable better understanding of the etiology of different forms of diabetes. However, despite advances in knowledge, there still exist gaps in what is known. More analyses are required to identify genetic variants associated with GDM, and LADA, among other diabetes subtypes. In addition, there still exist genetic variants whose association lacks replicability from its initial discovery. Many associations have only been found in one ethnicity, and these findings should be transferred to other ethnic groups. Understanding the biological and translational implications of this evidence will inform interventions and treatments to improve health outcomes associated with diabetes.
Abstract Title
Risk factors for the development of acute post-surgical pain and transition to chronic post-surgical pain in paediatric patients: a systematic review and meta-analysis

Author(s) – Yu, W., Yeung, K., Chow, C., Schmidt, L.

Abstract description
Over 5 million children undergo surgery in North America each year and approximately 40-60% experience moderate-severe pain postoperatively. Pain which persists following surgery has significant effects on health outcomes such as physical function, and contributes to increased healthcare costs. While many systematic reviews exist in adults, literature in children is lacking and existing systematic reviews focus only on chronic postoperative pain (CPSP). Given that acute postoperative pain (APSP) may lead to CPSP, this systematic review aims to determine risk factors for APSP as well as risk factors potentially involved in the transition from APSP to CPSP. The biopsychosocial model is central to our review as it describes the interplay between biological, psychological, and socio-environmental processes in determining response and adaptation to painful events. Studies which were published in English and assessed postoperative pain following surgery in children under 18 were obtained through literature searches in MEDLINE, EMBASE, CINAHL, PsycINFO, CENTRAL, and Web of Science. The literature search yielded 7303 articles and 6 additional articles were obtained through other sources. After removal of duplicates, 4481 articles remained and 97 articles were assessed for full-text eligibility. Included studies will be extracted for study and population characteristics, surgery type, primary and secondary outcomes, and key results. Overall quality of the included studies will be assessed using the Quality in Prognostic Studies tool. The findings from this systematic review and meta-analysis will enable better identification of children at risk for poorer outcomes following surgery and inform the development of interventions for this patient population.
Abstract Title
Plant-Based diet and the impact on Young Adults' Cardiovascular Heath: a Systematic Review and Meta-analysis

Author(s) – Zhao Heather Jianbo, Karimi Arian, Sikder Omaike, de Sousa Russell J.

Abstract description
Introduction: Many studies have observed the aging population’s relationship between cardiovascular health and plant-based diets. However, little attention has been placed on the effect of such diets in the cardiovascular health and prevention of metabolic syndrome of young adults. A systematic review and meta-analysis were conducted to assess for such effect in the younger population.

Methods: Studies were identified using MEDLINE, EMBASE, Web of Science, and CINAHL (through October 25, 2018). Cited articles on systematic reviews were also considered. Observational studies reporting associations between vegetarian or vegan diet and metabolic syndrome were eligible for inclusion. We abstracted participant characteristics, design features, and measured outcomes (SBP, DBP, MABP, HDL, LDL, triglyceride levels, Blood glucose levels, Hip-Waist ratio, and metabolic syndromes). Heterogeneity will be assessed. (Q statistic) and quantified ($I^2$).

Results: In 6 cohort studies, only 4 were available for meta-analysis. Of the assessed outcomes, none were statistically significant, suggesting that plant-based diet do not have an important effect on cardiovascular health in young adults.

Limitations: Our analyses were limited by sample size and possibly the date as most of the included studies were conducted before the 2000’s, indicating possible change for global diets.

Conclusions: The effects of plant-based diets in young adults and improvement for cardiovascular health are unclear. Additional studies involving vegetarian diets and young adult’s cardiovascular health must be conducted to reach a high-power conclusion.
**Abstract Title**
Infusion of Serp-1 and M-T7 lowers numbers of macrophages in spinal cord injury thus providing neuroprotection

**Author(s)** – Zukowski Justyna, Kwiecien Jacek

**Abstract description**
Immediately after spinal cord injury, there is necrosis of tissue in the surrounding region. Following this initial necrosis, there is abundant macrophage infiltration and the formation of a cavity of injury. The cavity of injury is a highly immunogenic environment, where macrophages phagocytize damaged myelin and irreversibly damage the neural tissue. Current treatments of spinal cord injury have not been successful in minimizing inflammation and controlling the size of the cavity of injury. However, administration of low dose dexamethasone in rats has been promising in limiting phagocytosis without inducing toxicity. Similarly, viral anti-inflammatory proteins, Serp-1 and M-T7 have minimized macrophage infiltration and tissue destruction. In this project, rats with induced spinal cord injury will undergo treatment with dexamethasone, Serp-1, M-T7, and a combination of Serp-1and M-T7 over various periods of time to examine the abundance of macrophages and tissue damage in and surrounding the cavity of injury. Plasma and cerebrospinal fluid will also be collected from the animals to investigate biomarkers of spinal cord injury, tissue damage, and its restoration.