Bachelor of Health Sciences (Honours) Program

Project & Thesis Abstracts

2019-20
Unfortunately, this year’s BHSc (Hons) Program Poster Day had to be cancelled due to the pandemic, meaning that we didn’t have our usual opportunity to browse the projects hung in the atrium at MUSC, and to engage in conversation with one another about the projects undertaken. That makes this abstract book all the more significant this year, serving as the repository to document the substantial body of work undertaken by students in BHSc in partnership with faculty and community partners to explore a wide range of health-related issues and answer a variety of questions in health through research.

In perusing this book, as always, I’m impressed by the diversity of the questions being asked and the methods and approaches being applied to answer them. As these abstracts make clear, “health” is much more than just a biological phenomenon; health is relevant across the entire range of human existence and endeavour. From the laboratory to the clinic to the community, from molecules to policies to culture, from the hyper-local to global, these projects reflect the engagement of BHSc students with questions across the broad scope of the domain of health.

I want to commend all of the students who are sharing their work here, along with all of the faculty, staff, community partners, and participants for their roles in supporting and enabling this impressive body of work. Particular thanks are due to all of the supervisors who offered opportunities to students to learn about research, mentored them through the nuances and challenges of the realities of research, and modeled the creativity, innovation, and perseverance that research demands of its practitioners.

Research is really a superlative expression of the philosophy of inquiry that is so central to BHSc’s educational identity – a manifestation of the ability to pose compelling questions, identify methods to derive answers to those questions iteratively, collaboration with others, situating your work in the broader context, subjecting your own work and yourself to constructive scrutiny in order to constantly improve those answers and improve one’s own abilities and insights. The abstracts contained here are artifacts of this process that we value so highly. Congratulations to all of you, and gratitude for everyone who played a part in making it happen.

Stacey A. Ritz
Assistant Dean – BHSc (Hons) Program
Course Code: HTHSCI 4A15

Abstract Title: Content Sort of Patient Reported Outcome Measures Used in Patients with Nail Disease: A Systematic Review

Abstract Description (maximum 250 words):

Objective: The purpose of this systematic review was to (1) identify all generic and nail-specific patient-reported outcome measures (PROMs) used in research for patients with nail conditions and (2) to identify the content measured by the nail-specific PROMs.

Design: A systematic review was conducted following PRISMA guidelines. MEDLINE and EMBASE were searched from inception to May 2019 to identify PROMs used in patients with nail conditions. Our team conducted a content analysis, qualitatively coding the items to identify the concepts covered and classifying content phrasing as positive or negative.

Results: 185 of 3289 articles screened were reviewed. Six generic and seven nail-specific PROMs were in use to assess PROs in patients with nail conditions. Existing nail-specific PROMs were limited to use for onychomycosis and nail psoriasis. Non-specific PROMs such as the SF-36 and DLQI were used for a wide range of nail diseases. The nail-specific PROMs included 175 items that were categorized into 5 domains, 18 subdomains and 67 health concepts. Psychological wellbeing was the most frequently measured domain with 48 items. 68.6% of items had negative content or phrasing such as “I worry that people do not like to be with me”. We found a limited number of items measuring nail appearance (n= 32), physical function (n= 19) and treatment expectations (n= 1).

Conclusion: In populations affected by nail disorders, treatments can impact nail appearance, physical function, activities of daily living and body image. This review highlights important gaps in the comprehensiveness of constructs captured in currently used PROMs.

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Abstract Title: Intra/Inter-rater Assessment of Chordee Measurement Using an Angle Meter Smartphone Application

Abstract Description (maximum 250 words):

Introduction
Ventral penile curvature, or chordee, is a clinical representation common to patients with hypospadias (1). Chordee may be associated with painful erection and compromised fertility (2,3). An accurate measurement of penile curvature during a full erection is crucial for surgical correction. However, there is a lack of literature describing a standardized, optimal, and objective method for obtaining accurate measurements, as well as inconsistency in tools used among surgeons (4–7).

Methods
A reliability study was conducted to assess inter- and intra-rater reliability and accuracy of chordee measurements taken by a smartphone application (Angle Meter®) when compared to eyeball measurements from 25-perpendicular views of ventral penile curvature during an artificial erection. Data sets of images gathered from a hypospadias database were arranged independently, and five images were repeated to assess intra-rater reliability. Measurements were independently assigned by 6 raters. Krippendorff’s Alpha was used to measure intra/inter-rater reliability, and REDCap (Research Electronic Data Capture) was used to collect participant information and chordee measurements. Statistical analyses were conducted using IBM SPSS V25.0 software.

Results
Greatest consistency is observed within Angle Meter® method 1 measurement results based on distribution of mean values. Although intra-rater reliability scores show high variability among the measurement methods, inter-rater results show highest reliability for the Angle Meter® methods of measurement.

Conclusion
Measurements obtained using the Angle Meter® mobile device application presented higher consistency and inter/intra-rater reliability when compared to eyeball measurements. Future directions will involve development and testing of a software application that automatically calculates penile curvature with the input of an image.


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References
Course Code: HTHSCI 4A15

Abstract Title: Addressing Sexual Violence Against Syrian Refugee Women and Girls in Lebanon

Abstract Description (maximum 250 words):
With the rise of the Syrian Civil War, Lebanon has witnessed the influx of nearly 1.5 million Syrian refugees. As the crisis continues, Syrian refugees living in Lebanon are disproportionately at risk for a number of poor health and social outcomes. Most notably, Syrian refugee women and girls who are increasingly vulnerable to sexual violence (SV) due to displacement. Several underlying factors at the legal, socioeconomic, social, and systems level contribute to this issue, including but not limited to a lack of documentation, rising debt, normalization of violence against women, and geographical disparities in the provision of SV services. This issue places Lebanon at a crossroads in meeting Goal 5 of the Sustainable Development Goals of the 2030 Agenda for Sustainable Development and upholding the Convention on the Elimination of all Forms of Discrimination Against Women. Strengthening efforts surrounding SV in humanitarian settings is not only critical to enhancing the health and well-being of Syrian women and girls, and their communities but also in reducing social, economic and health costs incurred by Lebanon in response to increased rates of SV. While there is limited quality evidence surrounding mechanisms to address this issue in humanitarian settings, policy options may be categorized into four overarching approaches: (1) expanding women’s control over economic resources and access to financial resources; (2) improving access to existing SV prevention and response services; (3) engaging community members in organizational decisions and monitoring; and (4) strengthening contemporary security and justice systems in Lebanon.

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Course Code: HTHSCI 4C09

Abstract Title: Prescription Medication Coverage for Children and Youth across Canada: A Scoping Review

Abstract Description (maximum 250 words):

Background: Canada includes an estimated 100 public drug plans and 100,000 private insurance plans. Previous literature suggests that drug coverage varies across provinces and territories, typically focusing on coverage for the elderly, those with select diseases, and those on social assistance. Objective: to undertake a scoping review of recent literature to evaluate the variation in drug coverage for children and youth in various jurisdictions across Canada.

Methods: Bibliographic databases and gray literature sources were screened to identify papers published between January 2005 and December 2019, focusing on drug coverage for children and youth under 25 years of age across Canada.

Results: There is minimal information in the literature about private plan coverage focusing on the proportion of individuals under 25 insured through private plans. 13 out of 14 jurisdictions report coverage for individuals under 25 through some form of general or income-based public drug plan. Every jurisdiction besides Quebec has additional disease-specific drug plans. However, ages of eligibility and coverage of diseases vary. General and income-based drug plans give individuals under 25 access to jurisdictional formularies. 3 out of 14 have no cost sharing for individuals under 25 meeting certain criteria, while 11 have highly variable cost sharing models.

Conclusion: Across the 14 jurisdictional public drug plans, there is consistency of individuals under 25 years of age meeting general or income-based plan. However, variability in age thresholds and disease-specific criteria continue to exist.

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Course Code: Unknown

Abstract Title: Goal-Setting Improves Transition Readiness in Adolescents with Juvenile Idiopathic Arthritis and Systemic Lupus Erythematosus

Abstract Description (maximum 250 words):

Background: For adolescents, the transition from pediatric to adult rheumatology care is associated with increased health risks and poor disease control. Optimizing adolescents’ ability to manage their own health independently is of utmost importance. Given the variability in transition readiness across similarly-aged individuals with the same disease, improving self-management skills must begin by understanding each adolescent’s current level of transition readiness. The TRANSITION-Q, a self-administered, validated, 14-item questionnaire (max 100), assesses self-management skills and was implemented in a clinical setting to determine changes in adolescents’ self-management skills over time.

Methods: Adolescents with juvenile idiopathic arthritis (JIA) and systemic lupus erythematosus (SLE) were recruited in the rheumatology transition clinic (14-18 years old) and young adult clinic (≥18 years old) at McMaster. Adolescents completed the TRANSITION-Q upon consent and at subsequent follow-up visits. After completing the first and/or subsequent TRANSITION-Q questionnaires, goals were established to improve transition readiness. Time between visits was at the physicians’ discretion.

Results: Of 28 respondents, 8 were male and 20 were female (mean (SD) age 16.6 (1.1) years); n=23 JIA (82%), n=5 SLE (18%). All participants were seen twice (mean (SD) follow-up time 5.6 (2.3) months), and 7 were seen 3 times (mean (SD) time from first to second follow-up 3.3 (1.4) months). Mean (SD) TRANSITION-Q scores at baseline and 2 follow-ups were 62.9 (14.3), 67.0 (11.9), and 75.0 (9.6), respectively.

Conclusion: Self-management skills appear to improve over time. Goal setting and using a tool to track self-management skills may be beneficial in preparing adolescents for transition to adult care.

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**Course Code:** HTHSCI 4A12

**Abstract Title:** Identification of E. coli strains for inflammatory bowel disease modeling

**Abstract Description** (maximum 250 words):
Adherent-invasive Escherichia coli (AIEC) have been shown to play a key role in the pathogenesis of inflammatory bowel diseases (IBDs) like Crohn’s disease and ulcerative colitis. This project aims to identify strains in the McMaster Institute of Infectious Disease Research Escherichia coli (E. coli) library that exhibit the AIEC pathotype. By identifying these strains, a mouse model of IBD can be developed. The development of such a model will allow for IBD to be better studied and characterized in vivo, while also allowing for the development of treatment options for IBD. To identify the strains that would serve as AIEC candidates, a literature search was performed with the goal of identifying genes and antibiotic resistance traits typical of the AIEC pathotype. The sequences of the identified virulence genes (fimH, pic, chiA, papGII/III, iss, and vat) were aligned with the sequences of the E. coli strains from the IIDR E. coli library. These strains were also screened for ampicillin resistance, another AIEC trait, using information gathered by the IIDR on their E. coli strains. Of the 122 IIDR E. coli strains, 7 demonstrated strong alignment to the identified AIEC traits: E. coli C0208, C0329, C0396, C0418, C0450, C0483, and C0596. These strains will be assessed individually and in various combinations for their capacity to induce IBD in mice.

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Course Code: HTHSCI 4A09

Abstract Title: Frailty as a Predictor for Post-operative Outcomes Following Pancreaticoduodenectomy (Whipple Procedure)

Abstract Description (maximum 250 words):

Background: Frailty could be used to assess perioperative risk. Pancreaticoduodenectomy (PD), also known as Whipple procedure, is the most common operation to treat pancreatic cancer and is a complex surgery that carries a high rate of complications. PD is commonly performed among patients at risk of being frail. The Canadian Study of Health and Aging has created a standardized frailty index which has been mapped to 11 variables called the modified frailty index (mFI).

Objective: We sought to evaluate the mFI as a predictor of postoperative morbidity and mortality in patients undergoing PD.

Methods: Retrospective cohort of adult patients undergoing PD at Hamilton Health Sciences from 2011-2018. The mFI was used to stratify patients into two groups, high (≥0.27) and low mFI (<0.27). The effect of mFI on primary outcomes (minor complications, major complications and 90-day mortality) was then assessed using statistical analysis.

Results: 432 patients (57% males) were screened, median age was 66 years. 291 patients (71.1%) experienced postoperative complications, of which 112 patients (36.5%) experienced major complications. 23 patients (5.3%) died within 90 days of surgery. 51 patients (11.8%) had high mFI. Chi-square tests demonstrated that the mFI as a predictor of postoperative mortality (p=0.0204) and minor complication (p=0.0251) was statistically significant, whereas for postoperative major complication (p=0.5177) it was not.

Conclusion: mFI predicts postoperative outcomes, specifically minor complications and mortality, following pancreaticoduodenectomy and can be used as a risk stratification tool for patients being considered for surgery.

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Word count: 240

Key words: Pancreaticoduodenectomy; Whipple procedure; Frailty; Postoperative complications; Morbidity; Mortality
**REB Status:** This study was approved by the Hamilton Integrated Research Ethics Board (Project 7879-C, approved October 1st, 2019).
Course Code: Unknown

Abstract Title: Evaluation of a Google Cardboard Stereo Image Viewer as a Valid Alternative to Cadaveric Specimens for Testing Anatomical Knowledge

Abstract Description (maximum 250 words):
The application of three-dimensional (3D) visualization technology has generated interest due to its potential to augment or even replace the resource-intensive cadaver use in anatomical education. We previously developed a smartphone application, titled VRBR, which uses an inexpensive headset to display 2D or stereoscopic-3D images of laboratory models for learning and testing anatomical knowledge. We aimed to compare the effectiveness and validity of stereoscopic-3D images, 2D images and cadaveric specimens in testing anatomical knowledge with practical examinations (OSPEs). Students who had previously completed an anatomy and physiology course (undergraduate = 39, graduate = 13) were randomized into one of three testing groups. Each group was administered OSPEs in all three modalities: VRBR–2D images, VRBR–stereoscopic 3D images or cadaveric specimens, and completed a cybersickness and user satisfaction questionnaire. Participants completed a stereo-fly and mental rotation test to assess potential covariates (i.e., stereoacuity and visuospatial ability). Data assessed via two-way ANOVA, suggested that Test A was significantly easier than Test B or C (F(2,147) = 11.463, p <0.001, η² = 0.156). Furthermore, participants performed significantly better on lab-based stations compared to 2D stations (F(2,147) = 5.225, p = 0.007, η² = 0.0695). 63% of participants experienced moderate to severe symptoms in at least one category with an overall severity rating of 6.9/48 (±5.1). The use of VRBR is promising for its affordability and accessibility during testing. However, due to reported cybersickness and poor performance, VRBR is an unlikely alternative to cadaveric specimens when testing anatomy.

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Course Code: HTHSCI 3H06

Abstract Title: Effects of Vegetarian and Meat-Based Diets on BMI Evolution in University Students

Abstract Description (maximum 250 words):

Background: The rising prevalence of obesity in the Canadian University population is a cause for concern. University students are particularly susceptible to weight gain, with 69% reporting an increase in BMI between their first and second years. Multiple co-morbidities are associated with obesity, such as ischemic stroke, coronary heart disease and premature death.

Objectives: This study explored the effects of vegetarian and meat-based diets on the BMI progression of undergraduate university students at McMaster University.

Methods: Eligible participants were recruited through social media and posters across the McMaster campus. During every undergraduate year of study, participants partook in two appointments occurring in October and in March of the following year. Weight, height, waist and hip circumference, as well as food recall and lifestyle questionnaires were administered during each appointment and were tracked throughout participants’ undergraduate career. Data was statistically analyzed using SPSS and adjusted for weight and height. Subgroup analysis was conducted for vegetarian and meat-eater diets, as well as gender.

Results: Both vegetarian and meat-eater based diet participants displayed an increase in body weight and BMI. Meat eater participants demonstrated a significant increase in waist-hip ratio while vegetarian participants did not.

Conclusions: Findings suggest that meat-eater diets contribute to a greater increase in BMI compared to vegetarian diets. Further studies should be conducted in other Canadian universities to further confirm our findings.

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Course Code: Unknown

Abstract Title: The Effects of Diet on Severity of Depression in Patients with Chronic Major Depressive Disorder

Abstract Description (maximum 250 words):

Objective
This observational study investigates the association of food security and dietary intake with depressive symptoms in a population with diagnosed major depressive disorder.

Methods
Food security was determined by a score on the household food security survey module and categorized participants as food secure or food insecure. Scores on the beck depression inventory scale were compared between the groups, as well as variables such as age and gender. A 12-item food frequency questionnaire was used to determine dietary intake over the previous 12 months. Average daily intakes were calculated for each item and compared between differing severities of depression.

Results
67.78% (n=61) of the sample population was determined to be food secure and 32.22% (n=29) was found to be food insecure (20% moderately food insecure and 12.22% severely food insecure). 75% of the participants that were food insecure had severe depression compared to only 60% of the participants that were food secure. Regarding daily intake, those with severe depression consumed more refined grains, meat with fat, poultry with skin, poultry skinless, fish, dairy, fruit, tea, and soda. While those that had less severe depression had higher daily consumption of whole grain, meat without fat, raw vegetables, nuts, beer, and diet soda.

Conclusion
In the current study, food security and frequent consumption of whole grains, raw vegetables, nuts, and meat without fat were associated with less severe depressive symptoms.

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Course Code: HTHSCI 4A09

Abstract Title: Data systems for organ donation research: linking donor and recipient data

Abstract Description (maximum 250 words):

Background
Canadian research to improve the management of deceased organ donors requires transplant outcome data from dispersed transplant programs.

Objective
We endeavored to describe the content, quality, and accessibility to donation researchers of transplant program databases across Canada.

Methods
We drafted a survey and conducted focus group interviews with clinical experts and methodologists to refine survey items. Three Clinical researchers and database experts associated with the CDTRP and the Health Canada Organ Donation Collaborative pretested the survey for clarity and ease of use. Ultimately, we emailed a 23-item online survey to database leads at 46 adult transplant programs across Canada.

Results
Thirty-five programs (76.1%) have responded. All program databases track recipient medical history; 23 (65.7%) record ex-vivo interventions; and 17 (48.6%) track pre-transplant medications. Most (91.4%) record mortality; 27 (77.1%) track biochemical data; 20 (57.1%) track pathology; 16 (45.7%) track mechanical support; 15 (42.9%) track physiologic data; and 13 (37.1%) track diagnostics. 31 (88.6%) and 29 (82.9%) can provide retrospective and prospective data access, respectively. Thirty (85.7%) databases require REB approval for access. Time to access varied from a few days to 1-2 months depending on data complexity.

Conclusions
Substantially varied content in research databases suggests that recipient data acquisition for donation studies will require dedicated personnel at several, but not all, transplant programs, in order to obtain retrospective data from the hospital Electronic Medical Record. Separate approval steps may be necessary through each participating program.

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Course Code: HTHSCI 4A15

Abstract Title: Interrupting reactivation of immunological memory reprograms allergy and averts anaphylaxis

Abstract Description (maximum 250 words):
The immune response against food is mediated by Th2 cells and immunoglobulin E (IgE), which binds to high affinity receptors on mast cells and basophils facilitating degranulation and release of vasoactive mediators. These mediators can exhibit profound systemic effects such as anaphylaxis. Our work has revealed signalling via Th2 cytokines IL-4/IL-13 is critical to the IgE recall response, as blockade of IL-4Ra during allergen re-exposures fully abrogated IgE production, Th2 cytokine secretion, and anaphylaxis. Moreover, we demonstrated that IL-4R blockade during allergen re-exposures led to sustained protection from IgE generation upon subsequent allergen re-exposures even six months post clearance of anti-IL-4Ra. Flow cytometry analysis suggested that anti-IL-4Ra treatment restricts B cell maturation, as an increased prevalence of germinal centre B cells was observed among allergen-specific B cells after secondary exposure. Additionally, a culture of splenocytes from anti-IL4Ra-treated mice revealed a shift to a non-Th2 cytokine signature, including increases in secreted IFN-γ and TNF-a, and a decrease in IL-6. Future research will explore whether the reprogrammed Th2 immune memory response is the result of the outgrowth of a non-Th2 population, or plasticity at the single-cell level.

Author List: Baribeau, Owen; Davidson, Malcolm; Bruton, Kelly; Jordana, Manel.

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Course Code: Unknown

Abstract Title: Barriers and Facilitators to Physical Activity in Children with Epilepsy

Abstract Description (maximum 250 words):
Researchers have recognized the need for individually-developed interventions to address child-identified challenges to epilepsy self-management. Young people’s biggest challenges appear to be cultivating and maintaining healthy vigorous physical activity (PA), a less sedentary life-style, and proper sleep habits over a 24-hour period. Current lifestyle recommendations for children with epilepsy are based solely on observational studies and consensus statements. Based on previous studies conducted by our team, we hope to partner with Epilepsy Canada and create a questionnaire identifying the barriers and facilitators to exercise in children with epilepsy. The questionnaire’s categories include personal information (such as sex and age), day-to-day physical activity, epilepsy specific factors, environmental factors, and personal factors. Originally, the survey was intended to be filled out by a research assistant who is reading the questions aloud to the participant. This would allow the participant to ask questions at any point and avoid miscommunication. However, due to measures implemented to prevent the spread of COVID-19, the surveys were transferred online to REDCap, with support from CanChild Centre for Childhood Disability Research. We are currently in the process of launching the feasibility study and hope to have preliminary results in the summer of 2020. We believe that improving lifestyle through increased physical activity is a safe, simple, and potentially cost-effective non-pharmacologic intervention to enhance the health, functioning and quality of life of children with epilepsy.

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Course Code: Unknown

Abstract Title: Genomic and clinical correlates of adrenocortical carcinoma in an adult patient with Li-Fraumeni Syndrome: a case report

Abstract Description (maximum 250 words):
Li-Fraumeni Syndrome (LFS) is defined by germline mutations of the p53 tumour suppressor gene. Adrenocortical carcinoma (ACC) is a rare aggressive malignancy that is commonly associated with LFS. Most LFS-linked ACC cases occur in children, and limited research has been dedicated to the clinical outcomes and genomics of adult cases with LFS-linked ACC. We report on a 34-year-old female who was diagnosed with 3 separate malignancies: stage III invasive ductal carcinoma of the right breast, metastatic ACC from the right adrenal gland, and grade 2 pleomorphic sarcoma of the left hand. Her invasive breast ductal carcinoma was treated with neoadjuvant chemotherapy and she received a bilateral mastectomy after her LFS was confirmed with genetic blood testing. Adrenal ACC was initially treated with a right nephrectomy and adrenalectomy, followed by adjuvant mitotane and two lines of chemotherapy after disease recurrence. Her hand sarcoma was treated by second ray amputation. Further, we conducted deep next-generation sequencing of each of her unique tumour tissue samples using FoundationONE CDx. A whole-genome shot capture followed by in vitro sequencing performed by the Illumina® HiSeq platform revealed a germline P191fs*18 TP53 mutation across all 3 tissue samples. This case provides insight into the genomics and clinical characteristics of LFS-linked adult-onset ACC and demonstrated that p53 mutations were preserved throughout each malignancy, without apparent treatment pressures on genomic profiling. This case reinforces the critical importance of adopting best practices for LFS, which include the implementation of highly vigilant screening and management of care in a multidisciplinary setting.

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Abstract Title: Characteristics of Physicians Providing Care to Retirement Home Residents in Ontario: A Cross-Sectional Cohort Study

Abstract Description (maximum 250 words):

Background:
Retirement homes are an increasingly common place of living for older adults in Ontario, Canada.1 However, there is limited information on the health service use of retirement home residents. Understanding access to healthcare providers in retirement homes as well as the commitment, training, and experience of healthcare providers caring for retirement home residents could inform how policymakers regulate retirement homes’ medical service provision.2,3

Objectives:
Study objectives were first, to identify Ontario retirement home residents that could be linked to administrative healthcare databases by postal code, and next, to characterize practices of physicians providing care to these residents to inform strategies for healthcare improvement.

Methods:
748 licensed retirement homes in the province of Ontario, Canada as of June 1, 2018, were identified from a publicly available registry.4 Postal codes and map-based technologies were then used to co-locate individuals within retirement home residences.5,6 A screening method was developed to determine the probability (certain, likely or unlikely unique) of identifying a retirement home resident using postal code information alone.

Results:
After screening, 274 (36.7%) postal codes were categorized as certain, 200 (26.7%) as likely, and 274 (36.7%) as unlikely to uniquely belong to a retirement home. Retirement homes with certain and likely postal codes had a capacity for 59,920 residents, representing 79.9% of all Ontario retirement home’s collective resident capacity.

Conclusions:
This study identified postal codes of 59,920 Ontario retirement home residents, representing almost 80% of the province’s resident capacity. This work provides the foundation for linking retirement home residents to administrative healthcare databases to understand their healthcare service use. Linking healthcare services to physician billing will help identify and characterize the practices of physicians providing care to retirement home residents. This will inform considerations of how retirement homes are funded, regulated, and incorporated into planning for the provision of healthcare for Canada’s ageing population.

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References (298 words)
**Course Code:** HTHSCI 4A12

**Abstract Title:** The Role of Leptin, sOB-R and FLI in Adolescent Idiopathic Scoliosis etiology: a systematic review and meta-analysis

**Abstract Description** (maximum 250 words):

Background: Adolescent Idiopathic Scoliosis (AIS) is the most common spinal deformity in adolescents, impacting 3% of youth. The exact mechanisms driving AIS remain unclear.

Leptin has been hypothesized to play a role in the development of AIS, as it is important in regulating bone formation and body composition. However, the role of leptin in AIS pathogenesis is inconsistent. This systematic review aimed to assess the evidence comparing circulating leptin and leptin receptor levels in AIS patients versus the general pediatric population.

Methods: MEDLINE, EMBASE, Web of Science, The Cochrane Library, and ClinicalTrials.gov were searched. The Newcastle-Ottawa scale was used to assess the risk of bias. The GRADE tool was used to determine certainty of evidence. Primary outcomes included comparison of serum leptin levels, soluble leptin receptor (sOB-R) concentration, and the free leptin index (FLI), an index of leptin’s biological action, in AIS patients versus controls.

Results: Eight studies were included. All studies measured serum leptin levels while three studies also measured sOB-R and two studies measured FLI. The sOB-R concentration was significantly higher (p-value < 0.00001, 95% CI 1.58 – 3.65) with moderate certainty and the FLI was significantly lower (p-value <0.0001, 95% CI -0.22 – -0.08) with high certainty in AIS patients compared to controls. There was no significant difference (p=0.14, 95% CI -4.72 – 0.69) with very low certainty in serum leptin concentration between AIS patients and control.

Conclusion: AIS patients exhibit less leptin biological activity. Further studies are needed to determine the biology of leptin and sOB-R in AIS pathogenesis.

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Course Code: HTHSCI 4A15

Abstract Title: Routine Ultrasound Guidance for Vascular Access for Vascular Procedures: The UNIVERSAL trial

Abstract Description (maximum 250 words):
Coronary angiography (CA) is a cardiac procedure done in patients suspected of having heart disease in order to identify the presence of coronary artery narrowing’s or blockages. A transfemoral approach is used in many patients, where CA is performed via the femoral artery. During conventional transfemoral approach, X-Ray is used to identify bony landmarks and catheter inserted after identifying femoral artery using hand palpation in the groin area. However, this technique is associated with a 4-6% risk of complications including bleeding, hematoma and arterial damage (Chun 2018). Use of ultrasound allows direct and improved visualization of soft tissue and underlying vascular structures. Therefore, ultrasound (US) guidance during a transfemoral approach may allow the operator to get arterial puncture under direct visualization reducing complications associated with conventional “non-ultrasound” guided transfemoral approach. The purpose of this study is to conduct a large randomized trial to determine if the use of ultrasound guided transfemoral approach will reduce the rates of major vascular complications compared to conventional approach for angiography or percutaneous coronary intervention. A pilot study of 254 patients was conducted at Hamilton General hospital to determine the feasibility of a large multicenter trial. Demographic, clinical, procedural and outcome data were collected for these 254 patients after chart review and entered in the redcap database. A statistical analysis will be performed of the collected data to compare clinical outcomes and guide the sample size of the large randomized study.

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Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Abstract Title: Patients’ & Family Members’ Perceptions of Recovery in the Forensic Psychiatry Program

Abstract Description (maximum 250 words):
Forensic psychiatry services are provided to patients with mental illnesses that have been found not criminally responsible or unfit to stand trial. Forensic psychiatry services touch both criminal and healthcare systems which can at times lead to many restrictions given the circumstances. These restrictions can last many years and can have an impact on patients’ recovery, autonomy and relationships with others. A core idea of Recovery is that patients are active participants, rather than passive recipients of care. The literature acknowledges the challenges of integrating a Recovery approach into forensic psychiatry services; however, some of these aspects may be context specific. As a result, the Forensic Psychiatry Program at St. Joseph’s Healthcare Hamilton sought to explore patients’ perceptions of recovery within the Program. Two patient and one family focus group were facilitated by staff outside of the Program. A standard set of questions was prepared and the groups lasted one hour. Audiotapes were transcribed and analyzed. Patient groups identified four themes as important to recovery: (1) developing positive connections, (2) developing a better understanding of the forensic system, (3) balancing their lives within the forensic environment, (4) and progressing forward with their lives. The family focus group identified five themes: (1) patients returning to original identity, (2) opportunities to address the past, (3) developing positive connections, (4) balancing patient lives within the forensic environment, (5) and maintaining good communication with the staff. This project was recognized as a Quality Improvement initiative by the Hamilton integrated Research Ethics Board.

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**Course Code:** Unknown

**Abstract Title:** Genomic Analyses Identify Novel Molecular Signatures Specific for Treponema Providing Novel Means for Genetic and Biochemical Studies

**Abstract Description** (maximum 250 words):
Members of the genus Treponema include important pathogens of humans and animals in addition to commensal, symbiotic, and environmental species. Detailed characterizations of these organisms have been precluded by their fastidious nature and the interrelationships between these different Treponema species are not well understood. In this work, we closely examined the evolutionary relationships between 21 members of this genus for which genome sequences are available through comprehensive phylogenomic and comparative genomic approaches. Phylogenomic trees were constructed based on two large datasets of conserved proteins and 16S rRNA gene sequences, which consistently indicate that while the genus Treponema consists of a monophyletic group of organisms, members of Treponema diverge into three highly distinct and strongly supported clades, designated as the “Caldarium,” “Socranskiii” and “Pallidum” clades. Measures of genetic similarity were calculated based on genomic information and further indicate large genetic distances between species of these three lineages. In parallel, our comparative analyses have identified 53 conserved signature indels (CSIs) within protein sequences of Treponema species exclusively shared by members corresponding to these three identified clades and demarcating them in clear molecular terms. Treponema pallidum, the causative agent of venereal syphilis and type species of the genus, and several other species with emerging pathogenic potential, comprise the strongly supported “Pallidum” clade identified as a distinct lineage within the genus. The taxonomic reclassifications being proposed on the basis of these results hereby provide a novel framework for better understanding the genetic interrelationships and biological aspects of these important microbes.

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**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: Unknown

Abstract Title: Targeting Trauma: Identification and Intervention in Acute Mental Health Inpatient Settings

Abstract Description (maximum 250 words):

**Background.** Aims of this study was to examine the differences between individuals with and without PTSD symptoms in relation to the psychological symptoms associated with maintenance and treatment during their acute mental health admission. PTSD was targeted because of the high rate of symptoms reported by participants and the well-known relationship between trauma and worse mental health outcomes. This information would help guide the identification, development, and/or implementation of interventions.

**Method.** Participants were patients admitted to two acute mental health units at St. Joseph’s Healthcare Hamilton Charlton Campus (N = 46; mean age = 38 years old; 63% females). They completed a battery of self-reported psychological measures upon enrollment and were invited to participate in the weekly CBT program. Psychiatric diagnoses were collected from medical records.

**Results.** 85% of participants endorsed being exposed to trauma previously and 50% met threshold for PTSD on self-report measures. Only 9% were diagnosed with PTSD in their medical record. Through correlational analyses, PTSD symptoms were associated with higher self-reported symptoms of depression, anxiety, and psychosis. Individuals who met the threshold for PTSD showed lower distress tolerance and higher perceived stress than those who did not. Presence of trauma-related symptoms did not affect CBT participation.

**Conclusions.** A high proportion of patients have experienced trauma and report associated symptoms, yet few have identified diagnoses of PTSD. The fact that individuals participated in CBT regardless of their PTSD status suggests that this population can engage and potentially benefit from such interventions. Interventions aimed at increasing stress management, distress tolerance, and mindfulness could be beneficial for individuals with PTSD during admissions to acute mental health units. Future research is required to explore the feasibility and efficacy.

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**Course Code:** HTHSCI 4A12

**Abstract Title:** Medical Cannabis in Practice and Education

**Abstract Description** (maximum 250 words):
The goal of this thesis is to evaluate the current evidence regarding medical cannabis (MC) in Canada, and to recommend courses of action for the further education of physicians. A broad literature review was conducted to form a general understanding of the usage of MC for the treatment of pain, multiple sclerosis, cancer pain, nausea, and vomiting. With regards to evaluating cannabis education practices, instructors of the Science of Cannabis Continuing Education program at McMaster University were interviewed. Subsequently, pedagogical research was done to produce recommendations in response to feedback presented by the instructors.

**Author List:**
Chin, Thomas
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**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Abstract Title: 'Back to Reality' Series Psychoeducational Video Games For Increasing Knowledge of Psychosis Associated with Marijuana Use — A Student Project

Abstract Description (maximum 250 words):

Background
Cannabis use in youth is associated with a significant increase in mental health disorders, including psychosis, and there is a significantly greater risk for those who use cannabis at an early age.1 Video game technology shows promise of making youth aware of a variety of mental health disorders, including psychosis and depression. The ‘Back to Reality’ series is an original knowledge translation product — a video game designed to educate youth about psychosis, marijuana use, and pathways to care.2

Purpose
The purpose of this study was to evaluate the ‘Back to Reality’ series.

Methods
Twenty McMaster University students aged 17-22 played the ‘Back to Reality’ series and the control game, Morpheus’ Spell in a randomized order. After playing each game, the participants completed two quizzes and a survey that asked for their opinions about gameplay satisfaction.

Results
Participants who played Morpheus Spell first improved significantly after playing the ‘Back to Reality’ Series on quiz 1 (p = 0.03) and quiz 2 (p = 0.005). However, this was not observed in participants who played the ‘Back to Reality’ Series first for quiz 1 (p = 0.17) or quiz 2 (p = 0.28). Significantly more participants enjoyed the story of the ‘Back to Reality’ Series compared to Morpheus Spell (p = 0.0003). Thus, the ‘Back to Reality’ Series may be an effective psychoeducational tool.

Author List: Chiu, Justin and Archie, Suzanne

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References

Course Code: HTHSCI 4A15

Abstract Title: Fidelity Strategies for Community-Based Exercise Rehabilitation Programs: A Scoping Review

Abstract Description (maximum 250 words):

Purpose: To examine fidelity strategies that have been applied to community-based rehabilitation exercise programs (CBERP).

Methods: A literature search was conducted from 2000 to August 26, 2019 to identify studies that addressed implementation fidelity in CBERPs in MEDLINE, EMBASE, PsycINFO, AMED, CINAHL, SPORTDiscus, CENTRAL, REHABDATA, PEDro and OT seeker databases. Studies were included if they met the following criteria: 1) involved a community-based program or self-management program with an exercise protocol; 2) assessed, evaluated or identified strategies to ensure implementation fidelity; and 3) published in English. Two independent reviewers (YX, SC) screened the title and abstract, followed by full-text review. Each of the reviewers completed data extraction on 50% of the papers to identify study characteristics, exercise protocols, and strategies for implementation fidelity.

Results: Twenty-one articles were included. Six studies used general implementation frameworks, three studies applied fidelity-specific frameworks, and twelve studies employed fidelity strategies alone.

Conclusion: There is currently no clear standardized implementation fidelity-specific framework in the literature. However, major themes are found across existing frameworks and include identifying essential elements, providing rigorous training, ensuring proper planning and organizational readiness, and monitoring fidelity. Future research should focus on the standardization of a fidelity-specific framework especially in the field of CBERPs.

Author List: Cho, Stephen; Xu, Ying; Richardson, Julie

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): McMaster University
Course Code: Unknown

Abstract Title: Elucidating Mechanisms That Maintain Early Allergic Memory In Food Allergy

Abstract Description (maximum 250 words):
Food allergies are adverse immune reactions to otherwise innocuous food antigens. There are no diagnostic or prognostic markers that can be administered prior to a patient’s first allergic reaction. Immunity initiated upon early allergic priming remains under characterized, primarily due to a lack of models that reflect this phase of the disease. Here we investigate mechanisms that hold memory during allergic priming and mechanisms of allergen-specific IgE emergence following allergen re-exposures using a novel intragastric gavage murine model. We find that allergic memory imprinted during priming is long-lived, and potentially permanent. Allergic priming events and the transition to active allergy can be separated by large temporal gaps. Using sensitive tetramer based cell enrichments to isolate and phenotype allergen-specific cells, we conclude that allergen-specific B cells appear naive in secondary lymphoid organs post-priming. Phenotyping of T cell proliferation and functionality in vitro indicates that memory Th2 cells are activated post-priming. Further, CD40/CD40L interactions, presumably between B and T cells, are required upon secondary exposures for humoral emergence and associated clinical reactivity. We propose that the trajectory of allergic immunity starts with a pre-clinical, activated T cell phase which is insufficient to activate B cells. These T cells hold the memory of IgE responses and upon secondary exposure, are empowered with the capacity to interact with naive B cells and facilitate differentiation and IgE class switching. Detailed phenotyping of these memory T cells may provide useful early diagnostic tools to identify primed individuals prior to the transition to clinical allergy.

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Course Code: Unknown

Abstract Title: Investigating The Effects of Impaired Myogenic Response and Endoplasmic Reticulum Stress on Renal Vasculature and Structures in Chronic Kidney Disease

Abstract Description (maximum 250 words):
Chronic Kidney Disease (CKD) is characterized by progressive kidney damage resulting in the gradual decline of kidney function. Known biomarkers of kidney dysfunction include: media-to-lumen ratio of small resistance arteries, renal interstitial fibrosis, and renal protein casts. Evidence has correlated these factors with indices of renal function; we attempted to clarify the effect of myogenic response impairment and endoplasmic reticulum (ER) stress inhibition on these factors in rats in the context of CKD. With spontaneously hypertensive rats (SHR) as the model of human essential hypertension and Wistar Kyoto rats (WKY) as their normotensive controls, animals were subject to myogenic response impairment using nifedipine and ER stress inhibition using 4-phenylbutyrate acid (4-PBA). We created 4 treatment protocols for both rat models: 1) normal-salt diet (NS), 2) high-salt diet (HS), 3) high-salt diet concurrent with 4-PBA (HSP), and 4) high-salt diet concurrent with nifedipine (HSN). Vessels were stained with toluidine blue stain for media-to-lumen ratio analysis, and kidneys were stained with picrosirius red and periodic acid-Schiff stain for interstitial fibrosis and protein cast analysis, respectively. Quantification was done using ImageJ, and analysis using GraphPad Prism. No statistical significance seen looking at media-to-lumen ratios; data shows a potential correlation between high-salt diets and media-to-lumen ratios. SHR groups had significantly higher levels of fibrosis than WKY groups; no statistically significant results between treatment groups were witnessed. SHR groups had significantly higher levels of protein casts than WKY groups; the SHR-HSN group showed significantly lower levels of protein casts compared to the SHR-HS group.

Author List: Chow, Oliver; Nademi, Samira; Dickhout, Jeffrey

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: Unknown

Abstract Title: Lysosomal-Associated Membrane Protein 3 Modulates HSV-2 Infection in Human Vaginal Epithelial Cells

Abstract Description (maximum 250 words):
With microarray analysis, we have identified that HSV-2 infection upregulates the expression of lysosome-associated membrane protein 3 (LAMP3) in the vaginal epithelial cell line: Vk2/E6E7 (Vk2s). This data was confirmed via qPCR that detected a 240-fold increase of LAMP3 expression 24 hours post HSV-2 infection. As LAMP3 is a tetraspanin glycoprotein anchored to the late endosomal membrane of Vk2s, an organelle involved with cellular trafficking, we hypothesize that LAMP3 is essential for the viral shedding of HSV-2. To address this hypothesis, we will compare three co-cell lines: Vk2s, Vk2s with LAMP3 overexpressed (Vk2s-OE), and Vk2s with LAMP3 knocked-out (Vk2s-KO). The Vk2s-OE were generated with a lentiviral vector containing a transfer plasmid that increased the copy number of LAMP3 in the Vk2s genome. The Vk2s-KO were generated with CRISPR/Cas9 technology where Cas9 was programmed to excise exon 1 of LAMP3, rendering the protein inoperative. The three cell-lines were cultured and infected with HSV-2 in-vitro and the supernatants were collected for viral titration to compare HSV-2 shedding. As expected, Vk2s-OE were shown to have significantly higher viral titers, both intracellularly and extracellularly compared to control and Vk2s-KO were shown to have significantly lower viral titers. Furthermore, the viral genes: ICP0, VP16, and gB were analyzed over 24 hours to observe if LAMP3 affects the viral replication cycle. ICP0, VP16 and gB were shown to have a 200-, 120- and 60-fold increase in Vk2s-OE cells compared to control. This project has identified that LAMP3 may be a potential target to combat HSV-2 susceptibility.

Authors: Ryan Chow, Muhammad Atif Zahoor, Andrew Rempel, Aisha Nazli, Samuel T. Workenhe, Karen Mossman, and Charu Kaushic

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**Course Code:** HTHSCI 4C15/4C09/3H06

**Abstract Title:** A Video Game Tool for Improving Learning Outcomes in Academic Settings

**Abstract Description** (maximum 250 words):
This project explores the use of a video game tool to improve learning outcomes in an academic setting. Current research has found that video game playing translates to improved skills such as communication, resourcefulness, adaptability, cognition, among many others. Regardless of these benefits, the use of video games in non-traditional settings, such as university classrooms, has not been adequately explored. Thus, the video game developed for this project hopes to focus on teaching content to undergraduate students studying child development. The game will cover Piaget’s sensorimotor stage, which is defined by different milestones over the first two years of child development. Students will explore four unique concepts found within this stage, including the concepts of schemas, motor reflexes, stranger anxiety, and object permanence.

**Author List:** Edward Chu, Hadi Tehfe, Karthik Kannan, Michael Wong

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): N/a
Course Code: HTHSCI 4A15

Abstract Title: Creating an Educational Video Intervention to Address Pre-Injection Anxiety Associated with Intravitreal Injections at the Hamilton Regional Eye Institute

Abstract Description (maximum 250 words):
Intravitreal injections (IVIs), used to treat age-related macular degeneration, diabetic retinopathy and other conditions, are the most common intraocular procedures worldwide. Despite their widespread use, IVIs have been shown to cause great anxiety in patients, and addressing patients’ anxiety levels before receiving injections can help improve patient experience and treatment outcomes. Many studies conclude that pre-IVI counselling about what to expect during and after IVI are likely to reduce anxiety. In addition, evidence suggests that audiovisual interventions demonstrating the procedure from a patient’s perspective reduce anxiety to a greater extent than other educational modalities. This study aimed to design an audiovisual intervention to reduce pre-IVI anxiety at the Hamilton Regional Eye Institute (HREI). A literature review and Biographical Narrative Interpretive Method (BNIM) interviews with patients at the HREI were conducted to determine the content patients would benefit from having in the audiovisual intervention. Patients expressed that they wish to know more about the steps involved in the IVI procedure, the therapeutic benefits, and the side effects they could encounter. A 7-minute audiovisual intervention will be created. Patients scheduled to receive their first IVI will be randomized to view the audiovisual intervention or wait 30 minutes. Both patient groups will then complete the State-Trait Anxiety Inventory (STAI) questionnaire to assess anxiety levels. A third cohort of patients who previously had IVIs will wait 30 minutes before completing the STAI. STAI scores among the three groups will be compared and correlated with health literacy, patient age, sex, condition, and level of education.

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Course Code: HTHSCI 4A12

Abstract Title: Improving Hyper-Acute Ischemic Stroke Patient Outcomes in a Hospital Setting Utilizing Data and Technology

Abstract Description (maximum 250 words):
Hyper-acute ischemic stroke accounts for 87% of all stroke cases worldwide. In these cases, hyper- acute treatment is the gold-standard for restoring blood flow to the brain as quickly as possible. This is done by administering Tissue Plasminogen Activator (t-PA) and/or transferring a patient to another facility for Endovascular Thrombectomy (EVT). Focusing on this condition, the objective of this study is to establish efficient and effective future state processes to enhance patient outcomes. Three stroke outcomes were identified as central importance for improvement: Door-to-CTA time, which identifies Ischemic Stroke patients; Door-to-Needle (DTN) time, which looks at administration of t-PA following hospital admission; and Door-in-Door-out (DIDO) time, which measures the time from patient arrival to patient departure for EVT. Research and analysis of retrospective Door-to-CTA, DTN and DIDO data between the years of 2014-2019 was conducted to help achieve the desired target times of 15, 30, and 45 minutes respectively. Two databases were used: McKesson Horizon Patient Folder (HPF) – an online folder storing manual data from 2014 to July 2017; and EPIC – an electronic software program, implemented in July 2017. The average DTN time, pre-Epic, was 53.5 minutes. Only 11% of patients received t-PA treatment within 30 minutes of hospital admission. Average DTN times have improved to 36 minutes, post-Epic; with 40% of patients receiving t-PA within 30 minutes of hospital admission. Implementation of EPIC has resulted in noticeable improvements of patient care and treatment times. Further familiarity with the healthcare software will result in increased likelihood of achieving proposed target times.

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Course Code: HTHSCI 4A15

Abstract Title: Title: β-catenin in the kidney stroma modulates pathways and genes that regulate kidney development

Abstract Description (maximum 250 words):
Kidney development is dependent on proper cell communication between the epithelial, mesenchymal and stromal cell lineages. However, how the renal stroma communicates with other cell lineages and contributes to proper kidney development is not well known. β-catenin is a multifunctional protein involved in cell adhesion and transcriptional regulation. Based on our previous work, we hypothesize that stromal β-catenin modulates genes and signaling pathways that mediate this cellular communication. We generated mouse models with β-catenin deficiency (β-catstroma(def)) or overexpression (β-catstroma(over)) exclusively in the renal stroma. Wild-type, β-catstroma(def) and β-catstroma(over) stromal cells were isolated at E12.5 and E13.5 via fluorescent activated cell sorting (FACS). The isolated stromal cells then underwent RNA sequencing (RNA-seq). Results were validated through immunohistochemical and immunofluorescent staining of specific protein targets of interest. The RNA-seq analysis identified 93 biological processes that were down-regulated in β-catstroma(def) cells at E12.5 and E.13.5, and 491 biological processes that were up-regulated in β-catstroma(over) cells at E12.5 and E13.5. Interestingly, 16 processes linked to branching morphogenesis, 5 processes linked to nephrogenesis, and 15 processes linked to vascular development. Our results support that stromal β-catenin plays a significant role in regulating multiple major kidney developmental processes, including branching morphogenesis, nephrogenesis and vascular development.

Author List: Erin Deacon, Anna Li, Felix Boivin, Anna Dvorkin-Gheva, Joanna Cunanan, Darren Bridgewater

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Abstract Title:** Improving in vitro generation of CD70 CAR- T cells

**Abstract Description** *(maximum 250 words):*

**BACKGROUND:** Glioblastoma (GBM) is the most common malignant brain tumor and accounts for nearly 16% of all primary brain tumors. We identified CD70, which is a member of the tumor necrosis factor receptor, as a promising marker for targeting recurrent GBM brain tumor initiating cells (BTICs), and initiated the development of chimeric associated antigen (CAR) T cells against this cell surface marker.

**METHODS:** We assessed CD70 functionality on in vivo mice models, through silencing of patient derived BTICs for this marker. In addition, we tested different virus-producing lines and different quantities of virus to optimize CD70 CAR-T transduction in targeted T cells.

**RESULTS:** Silencing CD70 was shown to improve mice survival in vivo in three different BTIC lines, this in addition of reducing tumor volume. Comparison of virus production between HEK-293T and LentX-293T cell lines did not show any significant difference in the Myc-tag%, which is a protein tag that allows to differentiate over expressed proteins from wild type one’s. Changing the ratio of the virus added to each well in transducing the T cells also showed no significant differences in the Myc-tag%.

**CONCLUSION:** CD70 constitutes a relevant target for GBM therapy. Whereas virus producing-line did not affect CAR transduction efficiency on T cells, optimized virus load was performed.

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Course Code: HTHSCI 4B06

Abstract Title: TIDES scale for phenotypic research: the validation of a novel psychometric instrument measuring irritability in a large community sample.

Abstract Description (maximum 250 words):

Background:
Various literature has suggested that irritability may be associated with different psychiatric disorders in pediatric populations; however, diagnostic instruments evaluating irritability are both limited in their prevalence and effectiveness. For this reason, members of the Schachar-Crosby lab designed the TIDES questionnaire to address these limitations. The scope of this project will be to analyze the new diagnostic instrument by assessing various elements such as internal consistency and content validity.

Methods:
Parents of children recruited from the Ontario Science Centre as part of an ongoing Study, Spit for Science 2, completed the TIDES instrument for their children.

Statistical Analysis:
We tested the dimensionality first using Exploratory Factor Analysis (EFA) to determine a factor solution. We then tested/compared our factor solutions using confirmatory factor analysis (CFA) to determine the most suitable model. We evaluated additional psychometric properties of TIDES using R software. Also, in a subset of participants who completed the Affective Reactivity Index (ARI), an existing instrument intended to measure irritability, we tested whether TIDES converged with the ARI.

Results:
We found that a two-factor solution with subscales for irritability and oppositional behaviour best fit the data. TIDES (including both subscales) showed excellent internal consistency. TIDES total score was moderately-strongly correlated with ARI total indicating convergent validity.

Conclusion:
We recommend the use of TIDES in pediatric phenotype-based research.

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Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** HTHSCI 3H06

**Abstract Title:** Initial User Testing of a Novel Educational Prescription (EduRx) Web Application to Support Dementia Caregiver Education

**Abstract Description** (maximum 250 words):

**Background:** The novel EduRx web-app, designed to allow healthcare providers (HCP) to send catered multimedia lessons from the iGeriCare Initiative to informal dementia caregivers.

**Objectives:** This study explored the usability of the EduRx app design and its implementation in a field trial to refine and assess the EduRx concept.

**Methods:** The study was conducted in two phases, an Initial User Testing Phase, and a Field Trial phase. The first phase consisted of a convenience sample of 6 HCP recruited via email completing a series of tasks in the EduRx App using the established ‘Think Aloud’ Usability Testing Protocol. Participants then completed a System Usability Scale (SUS) Questionnaire and a brief semi-structured interview. The field trial was conducted with 55 participants recruited from representative clinical specialties and organizations via email. Participants were emailed a survey including a SUS and Net Promoter Score survey at either their 10th prescription or 2-months post-account creation. Utilization metrics were also recorded on the website.

**Results:** Initial user testing yielded an average SUS score of 91.4 among participants, which represents a software in the 99th percentile of professionally-designed software. Feedback on the app in interview was very positive, and several small areas of improvement were identified and changed for the field trial. The field trial has not concluded, and full results are expected in May 2020.

**Conclusions:** Initial user testing suggested the EduRx App was well designed. It also identified HCP potential concerns with its implementation, which is to be investigated in the field trial.

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Course Code: HTHSCI 4B06

Abstract Title: Client Experiences re: Markham Stouffville Hospital Alongside Midwifery Unit Survey Results

Abstract Description (maximum 250 words):
An Alongside Midwifery Unit (AMU) is a comprehensive model of maternity care which has been demonstrated globally to better meet the needs of low-risk birthing women by supporting forward client flow and satisfaction. The Markham Stouffville Hospital Alongside Midwifery Unit (MSH-AMU) is the first in Canada and is currently serving as a pilot project. By integrating a midwifery-led unit into the hospital that is physically adjacent to the obstetric birthing units, the model aims to improve clinical outcomes, and increase overall availability/efficiency of midwifery care. The objective of the study was to describe midwifery care recipients’ experiences and satisfaction within the MSH-AMU. An online mixed-methods structured survey was completed by a cohort of midwifery care recipients at the MSH obstetrics unit and by all midwifery care recipients at the MSH-AMU during September 2018-March 2019. Qualitative data was analyzed using the grounded theory to identify themes. Major themes observed in both the pre-AMU and post-AMU cohorts were client options/choice and maintaining the midwifery model of care. Majority of respondents indicated positive experiences and high levels of satisfaction, with similarities in themes/sub-themes during both phases. However, there were findings unique to the post-AMU cohort. Clients felt that their preferences were respected and felt they received personalized midwifery care in the post-AMU cohort. These findings suggest AMU model implementation may have enhanced midwifery-led maternity care and client satisfaction. Evaluation at the 12-18-month period will elucidate these observed themes. It will also assist in informing recommendations regarding the AMU model to other provincial sites.

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Course Code: Unknown

Abstract Title: Unknown

Abstract Description (maximum 250 words):

Background
Oscillating rotating and side to side toothbrushes are amongst the most available toothbrushes. A systematic review that compared different powered toothbrushes, including oscillating rotating and side to side, for plaque control and gingival health was conducted in 2011. The clinical importance between the two modes of actions in reducing plaque and gingival indices is unclear due to the lack of quality trials. Furthermore, many new studies on oscillating rotating and side to side toothbrushes have emerged since then.

Methods
This systematic review included studies that compared oscillating rotating vs side to side mode of action toothbrushes, while measuring plaque and gingival index reduction in patients without any motor disabilities. The two authors independently screened studies performed data abstractions and assessed risk of bias. The authors used random effects model meta-analysis and the Grading of Recommendations Assessment, Development and Evaluation approach to rate the certainty of evidence.

Results
This meta-analysis included a total of 2908 participants from 23 trials. At 4 weeks from baseline, the side to side toothbrushes may result in little to no difference in plaque index reduction when compared to oscillating rotating toothbrushes (Oscillating rotating (OR) vs side to side toothbrushes for plaque index reduction at 4 weeks from baseline. Standardized mean difference [SMD], 0.02 on a 2-point scale; 95% confidence interval [CI], -0.46 to 0.42).

Conclusions
Evidence does not suggest the superiority of either oscillating rotating or side to side toothbrushes in clinical practice for plaque or gingival index reductions.

Author List: Hussein El-chami, Ali Younis & Romina Brignardello

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A12

Abstract Title: Influence of a Public Health Nurse-Delivered Group Cognitive Behavioural Therapy Program on Social Support for Women with Postpartum Depression: A Randomized Controlled Trial

Abstract Description (maximum 250 words):

Background:
Postpartum depression (PPD) is a significant health concern that affects 15-20% of new mothers in the first year after delivery.1 Social support has been previously shown to protect against the development of PPD and to contribute towards recovery as well as relapse prevention.2,3 Group-based interventions, specifically group cognitive behavioural therapy (CBT), have also shown promise for increasing social support for women with PPD.4 The objective of the following study is to determine whether a group CBT delivered by public health nurses improves social support for mothers 18 years of age and older with PPD from baseline to 9 weeks’ follow-up.

Methods:
Mothers with PPD in the Niagara region who had delivered an infant within the past year (n=134 participants recruited) were randomized to receive either the 9-week group CBT intervention or the standard of perinatal care. Social support was measured using the 24-item Social Provisions Scale5 at baseline and 9-weeks’ follow-up.

Results:
Participants were recruited from July 2017 until February 2020. Demographic characteristics and social support were analyzed for 45 participants (treatment: n=26; control: n=19). The mean social support score improved for the treatment group (baseline: M=78.80, SD=11.23; 9 weeks: M=81.77, SD=19.86). A decrease was seen in the control group average scores (baseline: M=79.84, SD=9.03; 9 weeks: M=78.58, SD=10.21). However, these results were not statistically significant (p=0.179).

Conclusions:
A group-based CBT intervention delivered by public health nurses may improve social support for women with postpartum depression, but more research is required.

Author List:
Frechette, Kristiina
Layton, Haley
Van Lieshout, Ryan

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
References:
Course Code: HTHSCI 4A15

Abstract Title: Using EEG to measure the effects of improvisational group music therapy on stress and anxiety: an exploration of feasibility

Abstract Description (maximum 250 words):
Music therapy (MT) and music in general are known to mitigate stress and anxiety. Measuring these states in the context of MT is usually done using survey-based methods or biomarkers, which cannot track acute fluctuations. Since stress and anxiety are states of high cognitive arousal and negative affect, which are both parameters that can be measured using electroencephalography (EEG), EEG is potentially a fitting outcome measure for acute changes in stress and anxiety. Therefore, this review aimed to explore the viability of using EEG to measure stress and anxiety in the context of group MT in order to inform future phases of our concurrent study, which investigates the effects of Community Music Therapy (CMT) sessions on university students’ stress and anxiety levels. The research was carried out in three distinct stages: Stage 1 investigated whether EEG has been used to measure stress and anxiety; Stage 2 investigated whether EEG has been used to measure brain activity during group music-making; and Stage 3 investigated whether stress and anxiety have been measured using EEG during engagement with music. Results suggested that measuring stress and anxiety using EEG is possible, although variability between types and definitions of stress and anxiety reduce the overall feasibility of this. EEG can be used during group music-making but could disrupt the therapeutic process, and the data collected may be too artifact-ridden to be used for stress and anxiety measurement. Therefore, it is currently improbable that EEG is a viable outcome measure for stress and anxiety during CMT.

Author List: Friedberg, Daniel; Finnerty, Rachael; Baron, Annilee; HTH SCI 4A15

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** Unknown

**Abstract Title:** Weight management interventions for the treatment of preschool children with overweight or obesity

**Abstract Description** (maximum 250 words):

**Background:** According to the WHO, the number of young children, aged 2 to 5 years old, with overweight or obesity increased from 32 million globally in 1990 to 41 million in 2016, largely due to the rise of overweight and obesity in low to middle income countries. To counteract this epidemic, clinicians and policymakers need a more informed view of weight management interventions, factoring in the real-world applicability of relevant RCTs.

**Objectives:** 1) To assess the impact of weight management interventions on health outcomes in preschool age children who are overweight or obese. 2) To assess the applicability in the real world of available and/or relevant RCTs through use of the Rating of Included Trials on the Efficacy-Effectiveness Spectrum (RITES) tool.

**Methods:** This study is a systematic review and meta-analysis examining RCTs published between March 10th 2015 and Jan 31st 2020. Primary outcomes measures are changes in BMI and BMI z-score. Studies were deemed eligible if they involved weight management interventions for preschool aged children (2-6 years) with overweight or obesity and without syndromic causes, if they were at least 6 months in length and if they were conducted in a clinical setting. Results: A total of 14,028 unique records were pulled from eight databases, including EMBASE, MEDLINE, and the Cochrane Library. After title and abstract screening, 178 articles were deemed eligible for full-text review.

**Discussion:** This study hopes to elucidate recent developments in this field along with the applicability of its studies.

**Author List:** Gabarin R⁴, Nordlund SV², McPhee PG¹-³, Deacon C², Mbuagbaw L¹,⁴, Morrison K²,³

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**Course Code:** Unknown

**Abstract Title:** RISK PREDICTORS OF EXPERIENCING ADVERSE EVENTS FROM THE INACTIVATED TRIVALENT INFLUENZA VACCINE (ITIV) IN CHILDREN
A Cluster Randomized Control Trial

**Abstract Description** (maximum 250 words):

**Objective:** This study aims to highlight the possible predictors of developing adverse events towards the inactivated trivalent influenza vaccine (ITIV), whether it be age, sex or having had a previous adverse event (AE) in the prior year.

**Design:** A cluster randomized control trial conducted between December 2008 and June 2010. Participants: 702 Canadian children aged 3 to 15 years from 49 Hutterite colonies in Alberta, Manitoba, and Saskatchewan, Canada.

**Measurements:** Primary outcome: Presence of any adverse event (AAE). Secondary outcomes: Presence of a local adverse event (LAE) or a systemic adverse event (SAE). Risk predictors were also observed: Sex (M/F), age (3-9, 10-15) and having had a previous AE.

**Results:** The 2010 ITIV caused the most AEs compared to the other two seasons. In all three seasons, females experienced more AEs compared to males, whereas age had no impact on AEs. The Relative Risk (RR) of experiencing a LAE the second time, having had one the first season was around 1.5-2, staying relatively constant with the third vaccination (1.44). The RR of experiencing a SAE raised significantly with the third vaccination, where the RR of having an SAE the third time, having had one in the previous two seasons was 12.74, showing great associated risk.

**Conclusion:** Having a previous AE to the ITIV increases one’s risk of developing another AE in the following season. This risk increases with each additional previous AE experienced, especially with SAEs. Additionally, being female may increase your risk of developing AEs.

**Author List:** Garback, Lauren; Singh, Pardeep, BSc; Loeb, Mark; MD

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A12

Abstract Title: Leveraging Mendelian Randomization and Polygenic Risk Scores to Identify the Adverse Effects of Smoking Initiation

Abstract Description (maximum 250 words):

Background and Purpose—Given that smoking is a leading cause of preventable death worldwide, smokers are often stigmatized for their negative health outcomes. However, the genetic architecture behind smoking initiation is relatively unknown.

Methods—To address this issue, we conducted a joint Mendelian randomization (MR) and polygenic risk score (PRS) analysis study. MR was conducted using 378 genome-wide significant SNPs ($P = 5.0 \times 10^{-8}$) associated with smoking initiation from 1,232,091 individuals. A unidirectional 2-sample MR for 21,281 outcomes using the weighted median method was conducted. A Bonferroni correction ($2.35 \times 10^{-6}$) was applied, leaving ~600 outcomes. Our PRS was developed from the same set of SNPs from the same discovery cohort and applied to 342,447 unrelated British participants in the UK Biobank. Next, phenome-wide associations with 1134 ICD-10 outcomes were surveyed using a logistic regression model. A Bonferroni correction ($4.40 \times 10^{-5}$) was applied, leaving 127 significant outcomes. Lastly, between-group analyses were conducted to uncover phenotypic differences between non-smokers, previous smokers, and current smokers.

Results—Smoking initiation was found to be genetically associated with a reduced likelihood of educational attainment and physical activity. PRS results suggest that particular outcomes: depression and ischemic heart disease, occur independently from smoking status. Others, such as atrial fibrillation and obstructive chronic bronchitis, can be attributed to cigarette smoke rather than the smoker’s genetic predisposition.

Conclusions—Based on current findings, certain outcomes appear to be intrinsically caused by pathogenic effects of cigarette smoke, while others have a genetic basis independent from smoking altogether.

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* = These authors contributed equally to this thesis
1 - Population Health Research Institute, the Thrombosis & Atherosclerosis Research Institute, McMaster University, Hamilton, Ontario, Canada
Abstract Title: A Global Assessment of Mendelian Stroke Genetic Prevalence

Abstract Description (maximum 250 words):

**Background and Purpose**—Mendelian stroke confers a high lifetime risk for mutation carriers; however, ethnicity-specific prevalence estimates have been difficult to establish.

**Methods**—Eighteen genes responsible for Mendelian stroke were investigated using the Genome Aggregation Database. Genome Aggregation Database participants belonged to 1 of 7 populations: African/African-American, Latino/Admixed American, Ashkenazi Jewish, East Asian, Finnish European, non-Finnish European, and South Asian. Rare nonsynonymous variants from 101,635 participants free of neurological disease were examined for each ethnicity. Mutations were categorized according to 3 nested classes: pathogenic clinical variants, likely-damaging variants based on in-silico prediction, and all nonsynonymous variants.

**Results**—ABCC6, KRIT1, CECR1, COL3A1, COL4A1, COL4A2, COLGALT1, GLA, HTRA1, NOTCH3, RNF213, and TREX1 harbored pathogenic clinical variants in Genome Aggregation Database. Across all 18 genes, total nonsynonymous carrier frequency was found to be high in 5 ethnicities (African/African-American, Latino/Admixed American, East Asian, non-Finnish European, and South Asian; 28.5%–37.5%) while lower total frequencies were estimated for in-silico–predicted likely damaging variants (14.9%–19.7%) and pathogenic clinical variants (0.7%–2.8%). Overall, East Asian exhibited the highest total pathogenic clinical mutation carrier frequency (2.8%). Pathogenic NOTCH3 variants, causal for cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy, were most frequent among East Asian (1.1%) and South Asian (1.2%). East Asian also demonstrated the highest carrier rate for RNF213 (0.8%).

**Conclusions**—Especially, among pathogenic clinical variants, Mendelian stroke genetic prevalence differed significantly between populations. These prevalence estimates may serve as guides for screening and risk profiling in patients worldwide, particularly for understudied non-European populations.

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2 - Centre for Medical Informatics, Usher Institute, The University of Edinburgh, United Kingdom
Course Code: Unknown

Abstract Title: Investigating locus of control as a moderator and/or mediator of the relationship between stressful life events and suicide attempt

Abstract Description (maximum 250 words):

Background: Suicide, a major cause of premature and preventable death worldwide, is a growing concern amongst health professionals as well as societies and communities in general. Exposure to stressful life events (SLEs) is a well-established risk factor associated with suicidal ideation and suicide attempts in literature. However, the strength of this relationship is inconsistent, requiring the consideration of the influence of a third variable, locus of control (LOC). LOC is a theoretical concept that describes the orientation (internal or external) to which individuals perceive control over events and outcomes that occur in their life.

Purpose: The purpose of this paper is to investigate if an individual’s perceived LOC has a moderating and/or mediating effect on the relationship between exposure to SLEs and presence of suicide attempt.

Methods: Data used in the analysis was obtained from the Exploring the Determinants of Suicidal Behavior: Conventional and Emergent Risk study. The participants consisted of hospital psychiatric in-patients with recent or past suicide attempt/s as well as control psychiatric in-patients and community members without history of suicide attempt. LOC was assessed using a 6 item questionnaire. The presence of SLEs was assessed using an 8 item questionnaire. Moderation and mediation were assessed with logistic regression models using SPSS.

Results: LOC was determined to fully mediate the relationship between SLEs and suicide attempt, but did not moderate the relationship.

Author List: Lucy Guan¹,², Balpreet Panesar¹,³, Nitika Sanger¹,⁴, Tea Rosic¹,⁵,⁶, Zainab Samaan¹,⁵,⁶,⁷

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Course Code: HTHSCI 4A12

Abstract Title: Effects of tDCS on Tactile-Spatial Acuity: A Literature Review

Abstract Description (maximum 250 words):

Introduction – Transcranial Direct Current Stimulation (tDCS) is a portable, low cost stimulation device that can aid tactile perception investigations by targeting the somatosensory cortex. Polarity, current intensity, electrode size and stimulus duration contribute to tDCS efficacy. However, systematic investigations of tDCS on human tactile perception and standardization of study parameters are limited. This review seeks to investigate current literature regarding tDCS stimulation on the somatosensory cortex and its effects on tactile spatial acuity. Standardization of study parameters is a potential implication for this review.

Methods – Studies were screened via a combination of search strategies in OVID / Medline and Google Scholar. Inclusion criteria: studies that applied tDCS on the somatosensory cortex and considered effects on tactile spatial acuity. Exclusion criteria: studies that focused on MRI, fMRI, tACS, tFUS, motor/visual/auditory cortices, vicarious perception, nociception, hemodynamic responses, gain control, and literature reviews. Data were then organized according to study parameters, including polarity, intensity and duration, and task used.

Results & Discussion – n=36 studies were identified via title and abstract screening. n=14 were included in the literature review. Spatial acuity was found to be enhanced in all studies using anodal and dual-hemisphere tDCS. 70% of spatial acuity studies utilized the grating orientation task, the gold-standard test for measuring tactile spatial acuity. Recommendations for enhanced effect studies include: 2mA anodal tDCS for 20 minutes via 25cm2 electrodes. Conversely, cathodal stimulation elicited no effect or diminished tactile spatial acuity. Recommendations diminished effect studies include: 1mA cathodal tDCS for 20 minutes using 35cm2 electrodes.

Author List: Gupte, Dhruv; Wong, Michael

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: Unknown

Abstract Title: Limiting Loss-To-Follow-Up in Orthopaedic Studies Targeting Health Care Providers (LOST): An Example from the EDUCATE Study

Abstract Description (maximum 250 words):

Background: Sufficient follow-up is critical to the validity and generalizability of prospective studies. Some authors suggest that >20% loss signifies a serious threat to study validity. Follow-up of health providers (HCPs) can be particularly challenging.

Objectives: We sought to understand the barriers and facilitators to following up HCP participants in prospective orthopaedic studies, from the perspectives of research coordinators and study investigators.

Methods: We conducted semi-structured interviews with research personnel representing 6 fracture clinics of the EDUCATE study, a study assessing HCPs knowledge about supporting victims of intimate partner violence, and their retention of knowledge up to 12 months later as measured in a 20 minute survey. In this preliminary analysis of interview transcripts, one investigator identified common barriers and facilitators to follow-up. Formal coding and analyses using the RQDA qualitative software will follow.

Preliminary results: Prominent barriers to follow-up, in order of decreasing prominence, included: resident physicians moving to other sites; the survey length; and the extended study follow-up. Commonly noted facilitators included: soliciting help from senior clinic staff; providing the survey itself, or reminders, in-person; and prospectively tracking resident clinic sites when they left the study site. Other facilitators, not employed but noted for future studies, included: creating a shorter survey; providing an incentive for each survey; and synchronizing the study timing with resident rotations.

Discussion: The most crucial barrier to follow-up was resident movement away from the study site, and most of the solutions cited addressed this phenomenon, specifically.

Author List: Guyatt, Paige; Bzovksy, Sofia; Scott, Taryn; Bhandari, Mohit; Sprague, Sheila.

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** HTHSCI 4C06

**Abstract Title:** Assessing the Effect of Colostrum on Premature Infants

**Abstract Description** (maximum 250 words):
It is well known that the immune response and physical development is blunted and underdeveloped in the premature infant, but human milk supports the infant’s growth, function, and effectiveness. Thus, own mother’s colostrum administered oropharyngeally has potential to deliver oral immune therapy even before enteral feedings have begun. Colostrum is the first substance infants are adapted to consume, and it plats many roles in the developing premature infant. Research has shown that within colostrum there are several types of bacteria that are essential on the colonization of the infant gut. These bacteria are hypothesized to protect breastfed infants against infection and contribute to the maturation of the immune system. Colostrum as oral immune therapy (OIT), is delivered by taking one drop of fresh colostrum up via syringe and placing it between the baby’s cheek and gum. Little formal study has evaluated the effectiveness of OIT; however, small studies have demonstrated that the practice is safe, feasible and well tolerated. OIT allows for the safe delivery of colostrum and provides benefits to the infant such as immune protection, lowering infections and inflammation, and supporting infant weight gain. More quality improvement studies need to be conducted to assess the differences pre- and post-implementation of OIT. The goal within our research was to assess the impact of colostrum through OIT on premature infants by investigating quality of life indicators such as the infant’s IV removal, when full feedings were reached, and how often they were feeding.

**Author List:** Gazelle Halajha and Shikha Gupta-Bhatnagar

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: Unknown

Abstract Title: Hybrid Glenoid Designs in Anatomic Total Shoulder Arthroplasty: A Systematic Review

Abstract Description (maximum 250 words):

Purpose: While total shoulder arthroplasty (TSA) using all-polyethylene glenoid components remains the gold standard, symptomatic glenoid loosening over time is common. Hybrid glenoid components utilizing both polyethylene and metal components for fixation aim to provide short-term stability and long-term biologic fixation through bone-ingrowth. The purpose of this paper is to systematically assess the outcomes of TSA performed using hybrid glenoid components.

Methods: A comprehensive literature search was conducted on PubMed, Medline and Embase identifying all articles relevant to TSA using a hybrid glenoid component. Outcomes include clinical outcomes such as range of motion and patient reported outcomes as well as rates of complication and revision.

Results: 7 studies were included in this study with a total of 593 patients. Mean age of patients was 65 years, and 46% of the population was male. Mean follow-up was 50 months. The rate of complication was 7%. The rate of revision was 2.5%, and glenoid radiolucency was present in 33% of patients. Mean improvements in forward elevation, external rotation, internal rotation score and abduction were 49 degrees, 28 degrees, 2 points, and 42 degrees, respectively. Regarding patient-reported outcomes, mean improvement in Constant Score, ASES and UCLA score were 36 points, 52 points and 17 points, respectively.

Conclusion: TSA using hybrid glenoid components results in low rates of complication and revision at moderate follow-up with substantial improvements in range of motion and patient-reported outcomes. Compared to all-polyethylene glenoid components, lower complication and revision rates may make this a viable option in TSA.

Author List: Haleem, Ahmed; Sedrak, Phelopater; Gohal, Chetan; Athwal, George S; Alolabi, Bashar; Khan, Moin

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Abstract Title: THESIS PROJECT: DETERMINING PREDICTIVE FACTORS THAT ATTRIBUTE TO VOLUNTEER VISION SCREENER ACCURACY

Abstract Description (maximum 250 words):

Background: Healthcare community initiatives involving non-professional volunteers are becoming more prevalent. For example, a study in India assessed the effectiveness of using teachers to conduct eye examinations on school-aged children; female science teachers wearing spectacles were preferred (1). Another study preferred more mature students, by age and year of study, as trainees compared to younger students (2). These traits represent specific factors that promoted the success of various non-professional initiatives.

Objectives: The primary aim is to use data from the volunteer vision screener survey, with accuracy measurements collected, to determine any trends that indicate possible predictive factors of successful screeners.

Methods:
Phase One: Conducted a literature review to determine predictive factors that contribute to preference for a variety of community centered initiatives or trainee success. 89 articles were found that met initial criteria for review, of which 8 were included.
Phase Two: An online survey was distributed to all EYE-MAC volunteer vision screeners inquiring about demographic factors, past experience, and preferences. 26 individuals filled out the survey. Then, every individual was assigned a score out of 10 for “reliability & attendance” and “perceived vision screening skill”. This score was assigned by the volunteer vision screener coordinator.

Next Steps: Score trends indicated that attributes such as year of study, degree, and gender may affect perceived skill, as well as reliability and attendance. Once in-person classes resume for the Hamilton-Wentworth Catholic District School Board, volunteer vision screener eye examinations will be compared against an eye-care professional to test their screening accuracy.

Author List: Ava Harrison\textsuperscript{a}, Dallas Nash\textsuperscript{b}, Kourosh Sabri\textsuperscript{b}

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References


**Course Code:** HTHSCI 4R12

**Abstract Title:** The Use of Stationary Phase Infecting Lytic Bacteriophages in Treating *P. aeruginosa* Biofilms

**Abstract Description** (250 words maximum):

Pseudomonas aeruginosa is an opportunistic gram-negative pathogen that is resistant to many antibiotics and forms biofilms. Biofilms are clusters of bacteria encased in an extracellular matrix which further decreases antibiotic susceptibility. A promising alternative is phage therapy, the use of lytic bacteriophage instead of antibiotics. Bacteriophages are viruses that infect and kill specific strains of bacteria. Compared with antibiotics, phages are easier to discover since they are abundant in nature. In addition, phages are safe for human use as they do not infect human cells or beneficial bacteria. However, not all phages are equally effective, especially against biofilms. Both antibiotics and bacteriophages are often limited by slow growing and less metabolically active bacteria such as stationary phase bacteria or those present in a biofilm. As a result, this research project looks into relationship between the ability of bacteriophages to infect stationary phase bacteria and its ability to eradicate biofilms. Bacteriophages were passaged in stationary phase bacteria repeatedly until they developed mutations which allowed them to infect stationary phase bacteria. Then, the bacteriophages will be tested on biofilms in comparison to their original phenotype to determine whether the trait of infecting stationary phase is correlated with increased biofilm eradication.

**Author List** (names written as surname, first name):

He, Yun Zhi
Maddiboina, Dhanyasri
Hosseini-Doust, Zeinab

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** HTHSCI 4A15

**Abstract Title:** Environmental Sustainability Assessment and Intervention Design at the NICU in McMaster University Hospital

**Abstract Description** (maximum 250 words):

**Introduction**
Canada’s healthcare system contributes to 4.6% of the national carbon footprint. Although the Neonatal Intensive Care Unit (NICU) is a resource and energy-intensive unit, little research regarding its environmental footprint has been done. Our study aims to 1) identify areas of opportunity (AOO) to improve waste management and production at McMaster Children’s Hospital’s NICU and 2) design a strategy to improve its carbon footprint.

**Methods**
A physical waste audit was conducted for a 24-hour sample. Landfill and recyclable waste amounts (kg) were recorded, and a representative sample was sorted by item composition. An observational audit was carried out using some of the Sustainability Roadmap for Hospitals tools. A ‘staff perception and knowledge’ questionnaire is yet to be administered. All findings are being combined to identify AOO and design an intervention to address one of them.

**Results**
Physical audit: 93 bags (277.87kg total), were collected from the NICU. 16-21% of landfill waste was recyclable and 70% of items sent for recycling were not recyclable. Observational audit: we found that bedside waste is not optimally segregated, that education and standardization need improvement, and that unit layout/design may act as a barrier. Based on all results, two AOO, i.e. bedside waste segregation, and staff waste management education and involvement, have been identified as most important. Other AOO continue to be evaluated.

**Conclusion / Future Directions**
To improve the segregation of landfill and recyclable waste produced at the NICU, we plan to address the two aforementioned AOO via intervention design and implementation.

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Course Code: HTHSCI 4B06

Abstract Title: Investigating the Role of the Macrophage Microenvironment in Macrophage Extracellular Trap Formation

Abstract Description (maximum 250 words):
Recent studies have characterized a novel mechanism of immune defense in macrophages known as the extracellular traps (ETs) process. While ETs were first identified in neutrophils, similar macrophage ETs (METs) have more recently been described. Several stimuli have been reported to stimulate MET formation, including phorbol 1,2 myristate 13-acetate (PMA) and lipopolysaccharides (LPS). In order to further the current understanding of MET formation, this study sought to determine conditions under which METs occur, as well as whether the phenomenon is specific to particular murine cell types. An in vitro plate-based assay was developed to visualize MET formation. Potential MET-like structures were identified in PMA-stimulated primary murine peritoneal macrophages (PMs), as well as LPS-stimulated RAW 264.7 cells, primary murine PMs, and primary murine alveolar macrophages. It was observed that PMA did not stimulate potential MET formation in RAW 264.7 cells, in contrast to existing literature. However, LPS was found to non-specifically induce MET-like structure formation, as well as granular SYTOX Green staining in cells, irrespective of tissue of origin or cell type. These findings identify potential conditions under which MET formation may occur, providing greater insight into the factors that influence this process.

Author List: Rhea Jangra, Dr. Amy Gillgrass

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Course Code: HTHSCI 4A12

Abstract Title: Characteristics of the 1000 Top-cited Papers in Type 2 Diabetes

Abstract Description (maximum 250 words):

Introduction: Despite the introduction of novel therapies over the past decade, type 2 diabetes (T2D) remains a chronic condition which imposes significant societal and economic burden. There is therefore a critical need for research to improve the prediction of high-risk individuals and enhance prevention and treatment. In this study, we will identify and characterize the 1000 top-cited articles published in T2D to discover lines of inquiry that have the potential to be highly impactful.

Data Sources: All databases from the Institute for Scientific Information Web of Science were used to retrieve the 1000 top-cited papers in type 2 diabetes.

Study Selection: Specific search terms were used to retrieve English-language studies published from inception of the databases in 1864 to December 31, 2016 relating to T2D. The 1000 top-cited papers included original research and excluded systematic reviews unless they were accompanied by a meta-analysis. Data Extraction: One independent reviewer was trained by an expert in T2D research to assess paper eligibility and categorize the studies into categories and subcategories.

Data Synthesis: Once 1000 articles have been categorized, we plan to extract and analyze the following information from each article to elucidate trends: year of publication, journal, citation density, authors, first/co-first/co-last/last author nationality, first/co-first/co-last/last author gender, country population, country gross domestic product (GPA)/capita, and percentage of country GDP allocated to research. The results of this synthesis may result in a more efficient use of research funding, expediting scientific innovation.

Key Words: Bibliometrics; type 2 diabetes; review

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**Course Code:** HTHSCI 4A15

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

**Abstract Description** (maximum 250 words):

**Introduction:** The only available treatment for celiac disease (CD) is adherence to a strict gluten-free diet (GFD). CD is associated with several nutritional deficiencies, but the magnitude of these deficiencies in treated CD and how this is influenced by the duration and compliance of GFD is less clear.

**Objective:** To characterize nutritional deficiencies in celiac patients on a short-term (<2yrs) vs long-term (≥2yrs) GFD.

**Methods:** We included consecutive biopsy-proven CD patients attending the McMaster Adult Celiac Clinic. GFD adherence was assessed by validated Celiac Dietary Adherence Test (CDAT) and by anti-tissue transglutaminase antibody IgA (tTG IgA) levels. Serology, vitamins and minerals were measured in blood samples at enrolment. Continuous data was expressed as Median (IQR) and categorical data as a proportion. Mann-U-Whitney and Chi2 were used to compare differences between groups.

**Results:** 169 CD patients, 63% of which were following a GFD for over 2 years, were included. 83% of the patients had persistent symptoms in the follow-up and compliance was good or excellent in 86% of cases. The most common nutritional abnormalities were deficiencies in zinc (50%), vitamin D (40%), and copper (21%). There were no differences in nutritional deficiencies between group of 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 the presence of symptoms, dietary compliance or duration. Therefore, nutritional deficiencies may be more related to GFD nutritional inadequacy rather than malabsorption.

**WORD COUNT:** 249/250 HTHSCI4A15

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**Course Code:** HTHSCI 4B06

**Abstract Title:** COMPARING RISK TAKING BEHAVIOUR AND IMPULSIVITY AMONG CANNABIS USERS AND NON USERS

**Abstract Description** (maximum 250 words):
Individuals with substance use disorders display greater risk-taking tendencies compared to non-substance-using individuals. Reducing risk-taking behaviour could enhance an individual’s capacity to reduce or abstain from substance use. Neuromodulation can moderate risk-taking and impulsivity by modulating the excitability of neurons in the dorsolateral prefrontal cortex. Transcranial direct current stimulation (tDCS) is a neuromodulation technique involving the application of a weak electrical current over the scalp. While studies suggest heightened risk-taking among cannabis users, results in the literature are mixed and therefore warrants additional investigation. This thesis uses preliminary data from a larger tDCS study to compare baseline differences between cannabis users and non-substance users in delay discounting, impulsivity and risk-taking tendencies. Data was obtained from 45 participants comprising cannabis users and non users. To be eligible, participants must not have any tDCS contraindications (e.g. epilepsy), must currently use cannabis recreationally at least 3x per week (cannabis users), or have used cannabis no more than 5x across lifetime and not all in the past month (non-users). Risk Task, Monetary Choice Questionnaire (MCQ), and UPPS-S Impulsivity Scale. Analysis of variance was used to compare cannabis users and non users. Cannabis users displayed higher risk taking on average compared to non users based on performance on the Risk Task. Based on MCQ and UPPS-S scores, cannabis users also displayed higher impulsivity on average, aligning with the current literature. Better understanding behaviours associated with cannabis use such as heightened risk taking and impulsivity provides insight into the neurobiology of addiction for clinical applications.

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**Course Code:** HTHSCI 4B06 (Jessie Zhang), HTHSCI 4C15 (Audrey Jong)

**Abstract Title:** An Analysis of Death and Dying in Grief Narratives: Comparing Popular Films to Books

**Abstract Description** (maximum 250 words):

**Background:** While grief is an inevitable and unpredictable universal experience, it can differ among individuals. It is important to understand how society perceives this concept. This study aims to explore the depictions of death, dying, and bereavement in popular films, juxtaposed with real-life accounts of grief found within novels.

**Methods:** 45 films produced by Walt Disney (n = 23), Marvel (n = 17), and DC (n = 5) Studios and 12 books narrating real-life grief were included. Codes were derived and grouped into categories, which were then grouped into themes describing significant commonalities among grief narratives. Coding, categorization, and theme generation occurred concurrently, allowing observers to describe the data based on an in-depth knowledge of the material itself. A group consensus was established throughout the entire analysis.

**Results:** 95 codes were generated through analyzing the films. 10 categories were formed, including: “Manners of Death”, “Reasoning and Justice”, “Outward Expression”, and “Non-Acknowledgement”. A total of 215 codes were generated from analyzing the books. These were grouped into 36 categories including: “Grief is Recurring and Ongoing”, “Societal Expectations of Grief”, “Guilt, Shame, Blame, Regret”, and “Taboo of Discussing Death”.

**Discussion:** Within the films, manners of death tend to drive towards vengeful resolution, and there is a greater depiction of emotional reaction than adjustment. In the books, grief is ongoing and unique to each individual, there are positive outcomes to facing death, and there is more to loss than just the person. In both films and books, death brings on new challenges and opportunities in relationships.

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Zhang, Jessie
Trim, Kristina

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A12

Abstract Title: Assessing the Transparency of Informed Consent in Feasibility and Pilot Studies: A Single Center Quality Assurance Study

Abstract Description (maximum 250 words):
Pilot/feasibility studies assess the feasibility of conducting a larger study. Although researchers ought to communicate the feasibility objectives to their participants, many research ethics guidelines do not comment on how informed consent applies to pilot studies. It is unclear whether researchers and research ethics boards clearly communicate the purpose of pilot studies to participants consenting.

The primary objective of this study is to assess whether pilot/feasibility studies submitted for ethics approval to the Hamilton integrated Research Ethics Board (HiREB) transparently communicate the purpose of the study to participants through their informed consent practice. We found that of the approved consent documents 80.2% use the term “pilot” or “feasibility” in the title; 10.9% stated the definition of a pilot/feasibility study; 41.6% stated the primary objectives of the study are to assess feasibility; 18.3% stated the specific feasibility objectives; and 1.52% stated the criteria for the study to successfully lead to the main study. The transparency of the consent documents improved slightly after HiREB review. However, the majority of pilot studies did not communicate their feasibility objectives to participants, which imposes on their rights. Researchers and research ethics boards ought to work to improve transparency in the informed consent process of pilot studies and research ethics guidelines need an update to address pilot studies.

Author List: Khan, Mohammed I., Holek, Matthew, Bdair, Faris, Mbuagbaw, Lawrence, Eldridge, Sandra M., Chan, Claire L., Campbell, Michael J., Bond, Christine M., Hopewell, Sally, Lancaster, Gillian A., Thabane, Lehana

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**Course Code:** HTHSCI 4A15

**Abstract Title:** Quality of Life and Disease-Specific Symptom Burden in Patients with Philadelphia Chromosome-Negative Myeloproliferative Neoplasms: A Scoping Review

**Abstract Description** (maximum 250 words):
Philadelphia chromosome-negative myeloproliferative neoplasms (Ph-neg MPNs) are a group of blood cancers that include: polycythemia vera, essential thrombocythemia, and primary myelofibrosis. Patients with Ph-neg MPNs report disease-specific symptoms and reduced quality of life (QOL) which are attributed to systemic inflammation. However, the degree to which patients are affected by symptom burden and impaired QOL is not well understood. The purpose of this study is to identify disease-specific symptoms reported by adult patients with Ph-neg MPNs as well as the impact of Ph-neg MPNs on patient-reported quality of life (QOL). MEDLINE and EMBASE were searched for eligible studies that assessed one or more of: quality of life (QOL), health-related quality of life (HRQOL), disease-related symptoms, cognitive function or depression in adult Ph-neg MPN patients. Out of the 5152 articles that underwent abstract and title screening following duplicate removal (n=321), 451 articles were deemed eligible for full-text screening. Data from eligible articles will be charted according to the following categories: year of publication, journal, author, study population size, biological sex of study participants, mean participant age, study design, outcome measures, and descriptive statistics from studies. The study protocol will be stored on the OSF (Open Science Framework) registry. This scoping review will summarize the available literature on patient reported QOL and symptom burden (including depression and cognitive function) in patients with Ph-neg MPNs.

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Course Code: HTHSCI 4A15

Abstract Title: Conceptualizing Resilience from Trauma: Scoping Review on Sexually Victimized Adolescents

Abstract Description (maximum 250 words):

Background: Adolescence is a unique life stage between childhood and adulthood, characterized by distinct physical and social changes. Sexual victimization (SV) encompasses a range of unwanted sexual activities (e.g., coercion, manipulation, and/or violence by the perpetrator(s)) and a range of contexts (e.g., on-line and in-person, intra- and extra-familial, and from peers or dating partners). Compared to non-victims, SV victims are at a significantly higher risk of developing emotional, cognitive, and social problems, including but not limited to poor self-esteem, post-traumatic stress disorder, depression, and relationship difficulties. However, not all victims experience these problems, but may present as asymptomatic, or may demonstrate positive adjustment after the abuse —known as resilience. It is generally defined as the relative absence of psychopathology, the presence of positive adaptation, and recovery from potential symptoms, despite the experience of adversity. The experience of sexual victimization of adolescence is expected to have unique risk factors, outcomes, and considerations for treatment toward resilience.

Methodology: Four different databases were utilized in our search: MEDLINE, CINAHL, PsycINFO and Sociological Abstracts. Inclusion criteria included studies written in the English language and comprised of participants aged 11-18 years old, with no limits set on publication date.

Results and Implications: Preliminary searches gathered 192 studies and a total of 10 studies were included in our review. Across all studies analyzed, four main themes associated with sexually victimized adolescents and resilience included: social support, disclosure of victimization, self and surroundings, and SV characteristics.

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Course Code: HTHSCI 4A12

Abstract Title: The Role of Tricarboxylic Intermediate Nutraceutical in C2C12

Abstract Description (maximum 250 words):
The health of muscles is a major determinant for one’s quality of life as it plays a role in locomotion, support, and metabolism. To improve muscle health, nutritional supplements such as mitronite is used by athletes to improve exercise performance. The makeup of mitronite consists of tricarboxylic acid intermediates with proposed effects to improve mitochondrial function and muscle recovery. An in-vitro study on C2C12 cells was conducted to confirm these claims. Based on growth curves of varying mitronite concentrations, 1X mitronite was the optimal concentration that enhanced muscle growth. However, mitronite seemed to slow down or depress maturity of muscle cells. This was shown by the mRNA levels of myomaker and myomemerger (genes involved in fusion), and myoD and myogenin (markers of differentiation) decreasing to about half of that of control. Next, experiments were designed to test the possible effects of mitronite on contractility and post-contraction recovery. Mitronite did not affect the contractility of muscles nor the mRNA levels of post-contraction oxidative stress markers PGC1alph and SIRT3. Finally, experiments were run to test the effect of mitronite on oxidative phosphorylation. The specific enzyme activities of citrate synthase and COX showed no difference with the addition of mitronite. However, the protein expressions of CI and CV increased with the treatment of mitronite tested via a western blot. Based on these results, mitronite may increase the proliferation of myoblasts, slow down the maturation of myotubes, and effect the oxidative phosphorylation of myotubes, but the exact mechanism is not yet known.

Author List: Kim Sunny, Wong Wilfrid, Raha Sandeep

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Works Cited

Abstract Title: Uncovering mechanisms of memory in incipient Th2 immunity

Abstract Description (maximum 250 words):
Adverse immune reactions to innocuous food antigens have been an ongoing societal barrier to the quality of life and medical wellbeing for the 520 million individuals globally affected. Reactions against food antigens is driven by immunoglobulin (Ig) E that binds high-affinity receptors on mast cells and basophils. Cross-linking of IgE by allergen facilitates cell degranulation and release of preformed and newly synthesized vasoactive mediators and can culminate in anaphylaxis. IgE is produced by cells of the B cell lineage (plasma cells) upon instructions from a certain subset of lymphocytes (Th2 cells). The generation of IgE, a process referred to as allergic sensitization, is inherently silent in the absence of subsequent allergen exposure and, therefore, the ontogeny of this process has remained obscure.

We now have experimental evidence in a murine model that a single, specific perturbation of the system that in itself is not associated with the generation of IgE does establish lifelong immunological memory such that subsequent allergen exposures lead to the production of IgE and, eventually, anaphylaxis.

Therefore, the goal of this research project is to elucidate which immune cell type/subset is the reservoir of incipient memory and the mechanisms by which this memory is activated. To accomplish this, allergen-based enrichment techniques will be utilized to identify and phenotype memory cells within the B and T cell compartment. Overall, elucidating the identity of immune memory cells involved in incipient allergic sensitization will have important implications for the prediction of future, overt allergy.

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# Contributed equally
Course Code: HTHSCI 4A15

Abstract Title: Effect of Face Context on Learning Horizontally Oriented Facial Structure: An Analysis of Simulated Data

Abstract Description (maximum 250 words):
Previous studies suggest that perceptual learning with faces improves with practice and is usually stimulus specific (Hussain et al., 2011). Moreover, face identity information is largely conveyed by horizontally-oriented structure, which observers are biased to preferentially use when identifying faces (Dakin & Watt, 2009; Pachai et al., 2013). Although training to identify faces enhances processing of horizontal structure, observers still show small improvements in their use of vertical structure (Pachai et al., 2019). Alternatively, we can manipulate faces to contain informative structure only in the horizontal orientation, so observers are unable to learn to better process vertical structure. We examined whether practice identifying unfiltered or horizontally- filtered faces embedded in an uninformative, face-like context could improve accuracy in identifying novel faces. Face contexts were created by averaging all 10 faces in a dataset and replacing the horizontal structure with that of a target face. Participants were randomly assigned to two groups, and each trained on one set of 10 unfiltered or horizontal+context (HC) stimuli. Before and after training, we measured contrast thresholds for identification of trained and novel faces. All participants were tested on three conditions: unfiltered, HC, and vertical+context faces. Simulated data suggest both training groups had greatest improvements to unfiltered and HC faces. This is consistent with previous reports of enhanced horizontal bias to familiar faces. Additionally, both groups showed improved contrast thresholds to novel faces, but the improvement was larger for the HC group. Overall, these simulated results suggest that practice identifying faces with information exclusively in the horizontal orientation band may facilitate transfer of the learned horizontal bias to novel faces.

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References
Course Code: HTHSCI 4A12

Abstract Title: Assessing homologous recombination repair gene variants in high-grade serous ovarian tumours using a next-generation sequencing gene panel

Abstract Description (maximum 250 words):

Background: Homologous recombination repair (HRR) proteins are required to repair double-stranded DNA breaks and many are classified as tumour suppressors. Approximately, 20% of women with high grade serous ovarian cancer (HGSOC) have a BRCA1 or BRCA2 loss of function variant, either germline or somatic. Poly ADP-ribose polymerase (PARP) inhibitors are approved for the maintenance treatment of HGSOC in BRCA-deficient tumours. However, PARP inhibitors could potentially benefit patients with clinically significant variants in other HRR genes.

Objective: To evaluate the clinical utility of HRR variant assessment in matched HGSOC tumour and germline samples using a next-generation sequencing (NGS) gene panel.

Methods: Germline and tumour matched pair data were obtained from women with HGSOC and assessed by reviewing NGS data from both tissues. Germline and tumour data were analyzed for concordancy and quality using multiple measures. Detected variants in HHR genes were interpreted for clinical significance.

Results: Tumour and germline variants were highly concordant in all analyzed genes when coverage and variant allele frequency were sufficient. Clinically significant variants were identified in ATM, BRCA1, BRCA2, and RAD51C. Four clinically significant variants in BRCA1, BRCA2, and RAD51C were only detected in the tumour which would not have been identified if only germline testing was done.

Conclusion: The panel can accurately detect germline and somatic variants in the tumour. Given the therapeutic benefits of PARP inhibitors in BRCA-deficient, and potentially HRR-deficient tumours, it is important, in the clinical setting to identify all HRR variants that are present in the tumour.

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Abstract Title: Resting-State Spectral Power as a Predictor of Transcranial Magnetic Stimulation Evoked Cortical Reactivity

Abstract Description (maximum 250 words):
Transcranial magnetic stimulation (TMS) combined with resting-state electroencephalography (EEG), TMS-EEG, is regarded as a valuable measure of excitability in the cortex. The TMS pulse induces a cortical oscillatory response, which can be assessed via a global change over all EEG channels, referred to as the Global Mean Field Potential (GMFP). However, the relationships between TMS-evoked cortical reactivity and spontaneous cortical oscillations (resting-state EEG) have yet to be elucidated. In this study, we aimed to explore the ability of resting-state EEG to predict GMFP amplitude. Based on the event-related potential literature, we hypothesized that there would be a positive association between the spectral power of low frequency oscillatory bands, as recorded on the resting-EEG, and GMFP amplitude. To test this hypothesis, 10 minutes of resting-state EEG data were collected from 33 healthy participants (19 male, age=38.3±14.3). Subsequently, 100 single pulses of TMS were administered to the scalp region directly overlying the left dorsolateral prefrontal cortex. This region is an ideal area of study due to its prominent role in neurocognitive processes and implication in the pathophysiology of several neuropsychiatric disorders. Our results indicated a significant positive correlation between resting-state EEG theta power and both N45 (R2=0.52,p=0.001) and P60 (R2=0.34,p=0.013) GMFP amplitudes. In addition, a significant correlation was found between both delta and gamma power and the area under the curve (between 25-275ms) of the GMFP (R2=0.34,p=0.006). To conclude, these findings may provide initial mechanistic insight into the role of spontaneous cortical oscillations in shaping the brain’s responsiveness to TMS.

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Course Code: HTHSCI 4A12

Abstract Title: The Role of Estrogen Receptor Alpha (ESR1) Polymorphisms in the Etiology of Adolescent Idiopathic Scoliosis: A Systematic Review and Meta-Analysis

Abstract Description (maximum 250 words):

Background: Adolescent Idiopathic Scoliosis (AIS) is characterized as an atypical curvature of the spine that develops in late childhood or adolescence. As the most common form of scoliosis, AIS is present in approximately 1-3% of at-risk children between the ages of 10 and 16 years old. Despite active efforts to determine the etiology of AIS through research, the cause of the condition remains largely unknown. The estrogen receptor alpha (ESR1) is known to play a role in maintaining skeletal homeostasis and regulating metabolism.

Methods: An extensive literature search was conducted on MEDLINE, EMBASE, Web of Science and The Cochrane Library. The Newcastle-Ottawa scale and the GRADE tool was utilized to assess risk of bias and quality of evidence of included articles respectively. Two reviewers independently screened articles, abstracted data, and performed assessments, with conflicts being resolved through discussion. A meta-analysis was performed using the Revman 5 program.

Results: Ten studies were included in this systematic review. Six out of ten studies conducted genetic tests to determine the expression of the ESR1 PvuII genotype (PP/Pp/pp) and allele (P/p) polymorphisms in AIS versus control populations. Seven out of ten studies conducted genetic tests to determine the expression of the ESR1 XbaI genotype (XX/Xx/xx) and allele (X/x) polymorphisms in AIS versus control populations. The meta-analysis revealed a lack of clear association between XbaI and PvuII polymorphisms with AIS development.

Conclusion: Further studies are needed to determine the association between ESR1 polymorphisms and AIS development.

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Course Code: Unknown

Abstract Title: Role of Physical Activity In Sports-related Concussion in Youth and Adolescents: Preliminary Findings

Abstract Description (maximum 250 words):

Introduction
Improving our understanding of the role of physical activity following youth concussion can inform and improve management. As prior research suggests that greater levels of self-reported physical activity is associated with improved symptoms, we hope to ascertain a more definitive association between the two via the use of accelerometry – a well-validated and objective measure of physical activity.

Methods
4 controls and 3 concussed participants ages 12-18 years were asked to wear an accelerometer to monitor daily activity levels, as well as complete a routine symptom survey, the Post-Concussion Symptom Scale (PCSS), for a 1-month period. Once verified, the data was subdivided into 4 activity-intensity zones (sedentary/light/moderate/vigorous). Multiple statistical tests were used for analysis of the data, including the Mann-Whitney U test and pearson correlations.

Findings/Conclusions
On average, participants with concussion were more active and had a greater % of light (p=0.400), moderate (p=0.114), and moderate to vigorous physical activity (MVPA) (p=0.400) levels per day compared to the healthy controls. Within participants with concussion (N=3), greater physical activity levels in light, moderate, and MVPA revealed a negative correlation with change in PCSS symptom scores, although the results were not statistically significant (% in light; r=-0.993, p=0.074, % in moderate; r=-0.826, p=0.381, % in MVPA; r=-0.996, p=0.058). While a greater sample size in future studies using accelerometry would allow for more significant results to be observed, analysis of the preliminary data suggests participation in physical activity acutely following concussion may allow for quicker recovery of symptoms.

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Course Code: Unknown

Abstract Title: QUALITATIVE DATA COLLECTION TO ENHANCE HEART FAILURE SELF-CARE APPLICATION

Abstract Description (maximum 250 words):

Background
Heart failure (HF) is growing increasingly prevalent among older individuals in North America. Despite efforts to prevent readmissions, repeat hospitalizations remain common in this population. Appropriate HF self-care can potentially decrease readmissions although older individuals find self-care difficult. Mobile Health (mHealth) applications show promise in facilitating HF self-care. However, many mHealth applications are designed without meeting the specific needs of their target patient population. Thus, a user-centred approach is essential in developing an mHealth application.

Objective
The aim of this study is to conduct usability testing on the newly developed Heart Smart Scale (HSS), which integrates a Standardized Diuretic Decision Support Tool (SDDST) to a digital scale, to identify improvements needed regarding its usability.

Methods
We recruited four patients diagnosed with HF, aged ≥60 years, from the HF Clinic at the Hamilton General Hospital. Think aloud protocol was implemented during usability testing. Sessions were transcribed verbatim and analyzed for emerging themes using an inductive approach.

Preliminary Results
Six discrete issues were identified and categorized into three themes: 1) Workflow functionality, 2) User interface design, and 3) Confidence in technology. Many issues mentioned by patients involved initial difficulty navigating the HSS. Overall, participants concluded the HSS is simple in its functionality and usability.

Conclusion
To address the confidence in technology theme, an onboarding video with an educational component should be added to familiarize patients with the HSS and provide education regarding the SDDST. User-centred design should focus on improving workflow functionality and the interface design of the HSS.

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Course Code: Unknown

Abstract Title: Adjuvant Bisphosphonate Treatment in Post-Menopausal Breast Cancer Patients

Abstract Description (maximum 250 words):
Bisphosphonates are a class of drugs that have historically been used to treat hypercalcemia and bone pain resulting from metastatic cancer to bone.1 Recent publications have shown that adjuvant bisphosphonate use in post-menopausal women with breast cancer can reduce the risk of bone metastases and provide survival benefit.2 In 2016, Cancer Care Ontario published a guideline for the use of adjuvant bisphosphonates in post-menopausal women with early stage breast cancer (stage 1-3).2 The purpose of this study is to assess the guideline’s impact on practice in Hamilton and identify which patient populations are being offered adjuvant bisphosphonate treatment (ABT). METHODS: A retrospective chart review was performed on all patients at the Juravinski Cancer Centre treated for early stage breast cancer during a period prior to and post-guideline publication, analyzing for ABT usage and if guideline recommendations were followed. RESULTS: 729 charts met inclusion criteria: 337 pre-publication and 392 post-publication. All patients who received ABT (n=37) were offered treatment post-guideline. Of these, 82.1% were considered high risk for recurrence. 97.3% of treated patients were given Zoledronic Acid every 6 months for 3-5 years; dental risk was discussed with 86.5% patients; calcium and renal function was monitored in 94.6% patients; and 32.4% patients were either already on or recommended calcium and vitamin D supplements.
CONCLUSION: ABT use has increased since the guideline publication and those being offered treatment are in concordance with the recommendations. One area that is not well documented is the recommendation to take calcium and vitamin D supplementation.

Author List: Lee, Erika; Kazemi, Ghazaleh

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References
Course Code: HTHSCI 4A15

Abstract Title: The Potential Roles of Type-I and Type-II IFNs in Modulating the Production of OSM and its Comparator Cytokines

Abstract Description (maximum 250 words):
Oncostatin M (OSM) is a gp130 cytokine which lies at the nexus of multiple disease processes such as cancer, autoimmunity and fibrosis (Richards, 2013; Silver & Hunter, 2010; Tanaka & A Miyajima, 2003). Substantial evidence exists to implicate OSM in inducing pulmonary fibrosis independently of other IL-6 cytokines through a potential M2/Th2 polarized response (4–6). Although some studies have reported that prostaglandin E2 and lipopolysaccharide can stimulate OSM secretion, our group has also observed IL-33 to upregulate OSM production in macrophages (1,7–9, Botelho, unpublished). In the midst of these processes, the role that Type-I Interferons (IFN-Is) and Type-II Interferons (IFN-IIs) play in IL-33 mediated OSM production remains unclear. This project aimed to elucidate the relationship between IFNs and the IL-33 mediated production of OSM, and several comparator cytokines, by RAW 264.7 macrophages in vitro. Overall, we found that IFN-γ selectively downregulated OSM and LIF, while upregulating IL-6 and TNF-α production in response to IL-33 stimulation. Neither IFN-α nor IFN-β significantly changed OSM, LIF or TNF-α levels, but IFN-α appeared to upregulate IL-33 mediated IL-6 production in a similar fashion to IFN-γ. Stimulation with IFN-γ 6 hours in advance potentially exacerbated OSM and LIF downregulation through a primed response. However, IL-6 levels were uniformly decreased upon IFN-α, IFN-β and IFN-γ pre-stimulation, which we attributed to cytokine degradation after a 30-hour incubation period as opposed to true IFN-mediated effects. Taken together, our findings indicate that IFN-γ may skew the pleiotropic actions of IL-33 towards an M1/Th1 phenotype.

Word count: 241

Author List: Lee, Grace; Botelho, Fernando; MacDonald, Kyle; Richards, Carl.

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References
Course Code: HTHSCI 4A15

Abstract Title: Creative later life (Hamilton): Promoting quality of later-life through the use of music and digital music technology in an intergenerational program setting

Abstract Description (maximum 250 words):
The number of Canadians aged 65 and older is massively increasing. Despite the large number of older adults, there is a lack of regard to their sustained quality of life (QoL), as older adults may struggle with depressive symptoms, loneliness, and other challenges. To respond to these challenges, there is evidence that music has social and emotional benefits for the older adults. Furthermore, attention towards the uses of technology to enhance the quality of later-life has been increasing. This newly emerging field, called gerontechnology, provides opportunities for older adults to also benefit from this digital era. There is, however, a digital divide between the generations, as older adults are much less likely to engage in technology than youth. Although this divide can be a result of the older adults’ attitudinal barriers towards technology, as it has been found that many older people face anxieties when it comes to technology, research shows that there are also many older adults who are open to using technology. This study aims to explore how an intergenerational program combining music and technology may enhance the QoL of older adults, in addition to seeing how their attitudes toward technology may change. The findings of this study would provide a basis for further research on how music and gerontechnology can be used to support quality of later-life.

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Keywords: older adults, youth, students, technology, gerontechnology, music, intergenerational program, quality of life
Course Code: HTHSCI 4C15

Abstract Title: Facilitating a Collaborative Approach in Autism Research and Clinical Practice: The Pediatric Autism Research Cohort Study

Abstract Description (maximum 250 words):

Background: Autism Spectrum Disorder (ASD) affects 1 in 66 people, with 100,000 diagnosed cases in Ontario alone. The Hamilton-Niagara Regional Autism Program (now called the McMaster Children’s Hospital Autism Program) consisted of multiple outpatient clinics, supporting ~700 children. Despite its proximity to McMaster University, there is currently no mechanism in place to connect research done at the university to clinical practice. The Pediatric Autism Cohort Study (PARC) study aimed to bridge this research-to-practice gap by testing the feasibility of an ASD Research Protocol embedded within clinical practice to streamline patient recruitment and data collection.

Methods: Recruited newly diagnosed children with autism with a target sample size of 50. Measures already being used at the clinic were administered. PARC-specific measures were mailed out to participants at baseline and every 6 months for 2 years (5 timepoints in total) to supplement clinical data.

Results: 107 families were contacted between April 2018 and December 2018. Recruitment rate was 88% (n=94). The mean age at diagnosis was 2.16 years and 3.63 years at study entry. Questionnaire completion rate was >75% and attrition at 25% over 12 months (or 3 timepoints).

Conclusion: Feasibility was initially high, however, changes to the Ontario Autism Program led to restructuring of the clinic’s program deliveries and added family stressors. This created logistical barriers for PARC to continue patient recruitment and data collection within the clinic. Lessons learned from this feasibility trial can be used to inform future studies assessing the capacity for longitudinal, patient-oriented research in autism.

Author List: Sandra Lee¹, Anna Kata², Stelios Georgiades²

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Course Code: HTHSCI 4A12

Abstract Title: Evaluation of Venous Thromboembolism Recurrence Scores in an Unprovoked Pulmonary Embolism Population: A Post-Hoc Analysis of the PADIS-PE Trial

Abstract Description (209 words):
Patients with a first episode of unprovoked pulmonary embolism are at a life-long heightened risk of recurrence. Maintained treatment reduces this risk but exposes patients to potentially fatal hemorrhages. The performance of validated models and the role of pulmonary vascular obstruction in predicting recurrence remains unknown. We therefore externally validated the HERDOO2 score, the DASH score and the Updated Vienna Prediction Model on our “PADIS-PE” population of first unprovoked pulmonary embolism patients and subsequently used a hypothesis-driven approach to evaluate the predictive ability of pulmonary vascular obstruction. The HERDOO2, DASH and Updated Vienna scores displayed c-statistics of 0.61 (95%CI 0.54-0.68), 0.60 (95%CI 0.53-0.66) and 0.58 (95%CI 0.51-0.66) respectively. Only the HERDOO2 score identified low recurrence risk patients (<3%/year) after stopping anticoagulation. When added to either of the prediction models, pulmonary vascular obstruction measured at pulmonary embolism diagnosis and/or after 6 months of anticoagulation improved scores’ c-statistics between +0.06 and +0.11 points and consistently led to identifying at least 50% of patients who experienced recurrence but in whom the scores would have indicated against extended anticoagulation. In patients with a first unprovoked pulmonary embolism, the HERDOO2 score is able to identify patients with a low recurrence risk after treatment discontinuation. Addition of pulmonary vascular obstruction improves accuracy of all scores.

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*Members of the Prolongation d’un traitement par Antivitamine K pendant Dix-huit mois versus placebo au décours d’un premier épisode d’embolie pulmonaire Idiopathique traité Six mois (PADIS-PE) Study Group are listed in the Appendix.

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Course Code: HTHSCI 4A09 Thesis

Abstract Title: Comprehensive Review of Cystic Fibrosis Related Liver Disease (CFRLD) Literature & Clinical Guidelines in Different Canadian Pediatric Clinics

Abstract Description (maximum 250 words):
The purpose of this research is to gain a better understanding of the current practices and literature in place for pediatric CFRLD. A survey was conducted to review the current Canadian pediatric CFRLD clinical guidelines and differences between each clinic was analyzed. In total, 13 of the 24 CF clinics responded to the survey and the results of each clinic varied due to differences in clinical practice. Next, a review of the current literature on CFRLD was conducted and a controversy among the scientific community regarding CFRLD and its definition, screening methods, and treatment was revealed. Thus, this research poster summarizes the findings of the survey as well as the literature search on CFRLD.

Author List: Melissa Leung, Dr. Linda Pedder

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): (McMaster University, McMaster Children’s Hospital)
Abstract Title: Weight-adjusted Tinzaparin for Venous Thromboembolism Prophylaxis in Bariatric Surgery Patients Weighing 160kg or More

Abstract Description (maximum 250 words):

Introduction
Bariatric surgery patients suffer from an increased risk of venous thromboembolism (VTE), however, the optimal dose of low-molecular-weight heparin for VTE prophylaxis remains uncertain. Currently, St. Joseph's Health Care Hamilton (SJHCH) utilizes a weight-adjusted tinzaparin dosage (75 units/kg rounded to nearest pre-filled syringe) for post-operative VTE prophylaxis.

Objectives
This study analyzed the safety of weight-adjusted tinzaparin for VTE prophylaxis in bariatric surgery patients weighing ≥160 kg.

Methods
This was a single center retrospective study involving consecutive patients weighing ≥160 kg that underwent bariatric surgery from September 2015 to September 2019. Patients received a single dose of weight-adjusted subcutaneous unfractionated heparin (UFH) [5000 or 7500 IU] immediately prior to surgery, either no prophylaxis or subcutaneous UFH [5000 or 7500 IU] post-operatively, and either 10,000 or 14,000 IU of tinzaparin, beginning on the day after surgery, for 10 days. Intra-operative sequential compression devices could be used at the attending surgeon’s discretion. Occurrence of VTE and major bleeding within 30 days of surgery were assessed.

Results
389 patients were included for analyses (Table 1), while 18 patients were excluded. Reasons for exclusion were due to patient not requiring tinzaparin (n=4), alternative anti-coagulant usage (n=2), intra-op or post-op bleeding (n=2), received non-protocol dosage (n=8), and unspecified reasons (n=2). VTE and bleeding rates were 0.5% (n=2) and 2.1% (n=8) respectively.

Conclusions
The use of weight-adjusted tinzaparin was associated with a lower risk of bleeding (2.1%) compared to general bariatric surgery (4.4%). These findings support the use of dose-adjusted tinzaparin for VTE prevention for patients weighing ≥160 kg.

<table>
<thead>
<tr>
<th>Variable</th>
<th>All Patients (n = 389)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years), mean (SD)</td>
<td>43 (11)</td>
</tr>
<tr>
<td>Weight (kg), mean (SD)</td>
<td>182 (21)</td>
</tr>
<tr>
<td>Female (%)</td>
<td>188 (48)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td><strong>Body Mass Index, mean (kg/m²) (SD)</strong></td>
<td>60 (11)</td>
</tr>
<tr>
<td><strong>Received estrogen therapy (%)</strong></td>
<td>34 (9)</td>
</tr>
<tr>
<td><strong>Procedure</strong></td>
<td></td>
</tr>
<tr>
<td><em>Sleeve Gastrectomy</em></td>
<td>235 (60)</td>
</tr>
<tr>
<td><em>Roux-en-Y Gastric</em></td>
<td>131 (34)</td>
</tr>
<tr>
<td><em>Bypass Duodenal</em></td>
<td>22 (6)</td>
</tr>
<tr>
<td><em>Switch Biliopancreatic Diversion</em></td>
<td>1 (&lt;1)</td>
</tr>
<tr>
<td><strong>Pre-operative Unfractionated Heparin (%)</strong></td>
<td>348 (89)</td>
</tr>
<tr>
<td>7500 IU</td>
<td>348 (89)</td>
</tr>
<tr>
<td>5000 IU</td>
<td>42 (11)</td>
</tr>
<tr>
<td><strong>Post-operative Unfractionated Heparin (day of surgery) (%)</strong></td>
<td>373 (96)</td>
</tr>
<tr>
<td>5000 IU</td>
<td>373 (96)</td>
</tr>
<tr>
<td><em>Unspecified</em></td>
<td>17 (4)</td>
</tr>
<tr>
<td><strong>Tinzaparin Dosage (%)</strong></td>
<td></td>
</tr>
<tr>
<td>10,000 IU</td>
<td>66 (17)</td>
</tr>
<tr>
<td>14,000 IU</td>
<td>323 (83)</td>
</tr>
</tbody>
</table>

Table 1. Summary of Patient Characteristics SD, standard deviation; IU, international units

**Author List:** A. Li¹, A. Eshaghpour² BHSc, E.K. Tseng³,⁴ MD MSc, J.D. Douketis⁵ MD, M. Anvari⁶ MBBS PhD, M. Tiboni⁵ MD, D.M. Siegal⁵,⁷,⁸ MD MSc, R.T. Ikesaka⁹ MD, M.A. Crowther⁵,⁸MD MSc

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**Course Code:** HTHSCI 4C15 (Thesis in Child Health)

**Abstract Title:** The DATCH Study - Developmentally appropriate tools for children with Hemophilia to help them better understand their disease

**Abstract Description** (maximum 250 words):
A child’s understanding of their illness heavily depends on their stage of cognitive, physical, and social development. However, current resources for children with hemophilia have not been validated to be developmentally appropriate. Children who understand their condition can engage in conversations that reduce fear, improve self-confidence, and improve outcomes. By supporting children in understanding their hemophilia, healthcare workers are also acknowledging the patient’s developing autonomy, and cultivating a child’s decision-making abilities so that children can better advocate for their own care.

The main objective of this project was to develop developmentally appropriate tools for children with hemophilia to help them better understand their disease, focusing on the preoperational developmental stage. The caregiver plays an essential role to the child and their learning; therefore, tools were developed for both audiences: one for caregivers to learn how to teach their child about hemophilia given their specific developmental stage and a series of cartoon videos to understand hemophilia in a child-friendly manner.

Opinions of child life specialists, nurses, social workers, and physicians were sought when designing these tools and determining which concepts should be considered for each developmental stage. A cartoon character was developed using animation programs to create interactive educational videos. The videos will be provided to families and children with hemophilia. The effectiveness of these tools will also be evaluated.

This project will potentially allow children to better understand their hemophilia, become a part of the management process, and better advocate for their own long-term goals and concerns.

**Authors List:** Li, Casey Sohanlal, Allison Seroski, Nathan Chan, Anthony

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A09

Abstract Title: Eosinophil progenitors and relationship with atopic dermatitis severity

Abstract Description (maximum 250 words):

Background: As part of the Oral Steroids on Skin Outcomes in Atopic Dermatitis (OSAD) study, the Cardiorespiratory Research Laboratory identified eosinophil progenitors (EoPs) in the papillary dermis of atopic dermatitis (AD) patients. Although not statistically significant, trends toward positive correlations between papillary dermis EoP levels to clinical measures of AD (EASI and SCORAD) were found. This project aims to determine how these trends are affected when AD patient data from the AstraZeneca Atopic Dermatitis (AZAD) study is added to OSAD data.

Methods: EASI score, SCORAD score, and allergen-tissue punch biopsies for AZAD participants were collected by other lab members. The allergen-challenged punch biopsy acquired 24 hours post-intradermal allergen challenge provided information on papillary dermis EoP levels during the late cutaneous response of AD patients. Immunofluorescence staining was used to identify EoPs (CD34+ve/IL-5Rα+ve/Von Willebrand factor-ve) in the papillary dermis of skin biopsies. The Nikon Imaging Software Elements program was used to visualize histological sections. Correlations between EoP levels with EASI and SCORAD scores were assessed using Spearman’s rank correlation method.

Results: The project reconfirmed the presence of papillary dermis EoPs in AD patients, which supports the in situ hematopoiesis concept. However, no correlations between EoP levels with either EASI (r=0.0175, p>0.50) or SCORAD (r=0.1485, p=0.50) scores were found after pooling AZAD and OSAD data, suggesting EoPs do not greatly contribute to AD severity.

Conclusions: Eosinophils recruited from bone marrow and circulation may play a greater role in AD severity compared to EoP recruitment and maturation at the papillary dermis.

Author List: Terry Li, Christiane Whetstone, Gail M Gauverau

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4806

Abstract Title: Long-term Results of the PET-CT Imaging Prior to Liver Resection for Colorectal Adenocarcinoma Metastases (PETCAM) Trial: Validation of Prognostic Factors

Abstract Description (maximum 250 words):

Background: The “PET-CT prior to liver resection for Colorectal Adenocarcinoma Metastases” (PETCAM) trial was a large, multicenter randomized controlled study evaluating the effect of preoperative PET-CT vs. no PET-CT on the surgical management of patients with resectable colorectal cancer liver metastases. The study investigators recommended that the results be validated in a larger cohort of patients with colorectal cancer liver metastases that underwent liver resection and experienced disease recurrence.

Methods: This multicenter study was a retrospective cohort study that collected recurrence, management of recurrence and survival data of patients who experience recurrence following liver resection for colorectal cancer liver metastases. Survival information was obtained from multiple sources, including the patient’s hospital chart, the surgeon’s specific chart, their family physician and/or the patient’s medical oncologist or palliative care physician.

Results: Most patients had only one site of disease recurrence (82%), with 15% of patients having 2 sites. Most recurrences were in the liver (42%) and the chest (30%). Of the 117 patients, 48 (41%) underwent surgery with curative intent. There were 35/117, (30%) patients who received other forms of management upon recurrence, including includes radiofrequency ablation, radiation therapy, and pain and symptom management.

Conclusions: The results were similar between the PETCAM and PETCAM VAL cohorts. Therefore, it was predicted that the risk factors predictive of worse survival would also be similar between the two cohorts. However, data from the other coordinating research centres is needed. Knowing these risk factors provides a better understanding of disease biology and potential targets of therapy.

Author List: Li Vivian, Zhang Betty, Gundayao Marylrose, Faisal Sana, Faisal Raghda, Fabbro Matt, Valencia Marlie, Gu Chu-Shu, Hallet Julie, Martel Guillaume, Husien Mohamed E, Sapisochin Gonzalo, Serrano Pablo E

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A12

Abstract Title: Myeloid-Specific Deletion of ATF6α Gene Results in Obesity and Mild Hepatic Steatosis on a Chow Diet and Severe Steatosis on Methionine-Choline Deficient Diet

Abstract Description (maximum 250 words):

Background: By 2030, there will be a projected 1.12 billion obese individuals worldwide. It would be beneficial to identify and investigate cellular mechanisms which are impaired in obesity and its associated co-morbidities. ER stress results in the accumulation of unfolded and misfolded proteins in the ER lumen. There are three arms of the UPR which detect ER stress: double-stranded RNA-dependent protein kinase-like ER kinase (PERK), inositol-requiring enzyme 1 (IRE1), and activating transcription factor 6 (ATF6). Myeloid cells give rise to monocytes, dendritic cells and macrophages, and granulocytes. In the past, studies have demonstrated ways in which myeloid cells have alleviated obesity and associated co-morbidities. Studies have also shown the metabolic outcomes of knocking out or overexpressing ATF6, particularly on the liver.

Hypothesis: It is hypothesized that the myeloid cell-specific deletion of ATF6 contributes to obesity and hepatic steatosis

Methods: Cells and tissues were lysed in 4X SDS lysis buffer supplemented with protease and phosphatase inhibitor cocktails. Total protein concentration was measured using the Lowry protein assay kit. Proteins were then transferred onto nitrocellulose membranes using a wet transfer apparatus. Membranes were incubated in primary antibodies overnight at 4°C. Membranes were incubated for 1 hour at room temperature in HRP-conjugated secondary antibodies. Membranes were visualized using Western Lightning ECL Pro and quantified using ImageLab software.

Conclusions: Myeloid-specific deletion of ATF6 resulted in obesity and hepatic steatosis in chow and MCD conditions compared to wild type controls (WT). Overall, ATF6 is an important mediator of adipogenesis, lipogenesis, and the UPR.

Author List: Li V, Yousof T, Mejia-Benitez A, Sarmiento K, Revill SD, Naiel S, Mekhail O, Steinberg G, Ask K, Austin RC

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: Unknown

Abstract Title: Investigating the Nature of Brain-Derived Neurotrophic Factor on Endometriosis Pain

Abstract Description (maximum 250 words):

Background: Endometriosis is a gynecological condition affecting approximately 10-15% of females. The disease is characterized by the growth of endometrial epithelium and stromal cells outside the uterine cavity. Pain is the hallmark feature of endometriosis. Experiencing high levels of pain on a consistent basis negatively affects quality of life. No diagnostic biomarker currently exists for endometriosis, but recent evidence suggests that neurotrophins, a family of proteins assisting neuronal development, may play a role. Higher concentrations of BDNF in the plasma and follicular fluid of individuals may be correlated with endometriosis.

Objective: This cross-sectional investigation aims to explore the impact of BDNF on the severity of pelvic pain.

Methods: Participants were recruited from those undergoing diagnostic laparoscopies. 97 participants were recruited, with 76 cases and 21 controls. Data was collected through self-reported questionnaires prior to surgery. Statistical analysis was conducted using SigmaStat 3.0.

Results: Cases experience higher levels of pain, especially in regard to dysmenorrhea. No significant difference was elucidated between plasma BDNF concentrations. Most participants reported using NSAIDs, GnRH analogues, and contraceptives.

Conclusion: This study is limited in its external application due to concerns with sample characteristics. The sample size was insufficient to generate valid results, primarily due to the unequal number of cases and controls. Collecting data from those scheduled to undergo surgery may lead to over-representation of severer cases. We also did not include asymptomatic controls nor account for attempted treatment. Our results could reflect a narrower scope of the full relationship between BDNF levels and pain.

Author List: Jacqueline Lim, Dr. Lauren Foster BSc, MSc, PhD, FCAHS

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: Unknown

Abstract Title: Understanding the trajectory of infections, other co-morbidities, and healthcare utilization in persons who inject drugs (PWID)

Abstract Description (maximum 250 words):

Background: Injection drug use is a challenge to public health. Clinical experience indicates that people who inject drugs (PWID) are hospitalized frequently, especially with infectious diseases (ID). Little is known about their healthcare trajectories. Special concerns exist around PWID leaving the hospital with a peripherally inserted central catheter (PICC) line and leaving against medical advice (AMA).

Objective: To determine the feasibility of forming a cohort of PWID in Hamilton, who accessed care for infection secondary to drug use, and understand healthcare outcomes.

Methods: 211 participants were identified from a ID consult list at two hospitals from 2013-2018. Files were accessed using MediTech. Each file underwent primary and secondary reviews. Research Electronic Data Capture (REDCap) was used to record and analyze data.

Preliminary Results: 33.8% were admitted to the intensive care unit, 35.9% underwent surgery, and 10.6% died during the index admission. Primary ID diagnoses included endocarditis (25.3%), sepsis or bacteremia (23.8%), abscess (16.7%), cellulitis (11.6%), osteomyelitis (5.6%), septic arthritis (4.0%), pneumonia (2.0%), and other (11.7%). Within 30 days of discharge, 26.9% were seen in emergency again and 13.2% were readmitted. 43.1% were discharged home and 36.0% did not have a primary care physician. 26.4% were discharged with a PICC line, 10.6% left AMA, and 2.5% left AMA with a PICC line.

Conclusions: This study represents the first step in focusing interventions to enhance care in this population. Limitations relate to completeness of information from charts. Findings may not be generalizable to all PWID, since ID service lists were used.

Author List: Jacqueline Lim, Sureka Pavalagantharajah BHSc, Dr. Elizabeth Alvarez MD, MPH, PhD, CMCBT

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A12

Abstract Title: A Retrospective Study on the Number of Reported Post Concussion Symptoms Determined by Socioeconomic Factors: An Interim Analysis

Abstract Description (maximum 250 words):
Mild traumatic brain injury (mTBI), more commonly known as a concussion, is an acute condition resulting from the brain being shaken inside the skull. It is the most common type of traumatic brain injury and is a significant cause of morbidity and mortality with many suffering detrimental symptoms for years after the injury. Socioeconomic status (SES) is a well-known predictor of health status and has been linked to a wide range of health problems, such as low birthweight, cardiovascular disease, hypertension, arthritis, diabetes, and cancer. However, there is a lack of research on its effects in the context of concussions. The aim of the current study is to reduce the knowledge gap in the effects of SES on concussion prognosis and recovery by determining if living in neighbourhoods with lower overall health, social and economic status is a predictor of the number of post-concussion symptoms an individual’s reports at the time of assessment. We hypothesize that neighbourhood zones with lower cumulative health, social and economic score are associated with a greater number of post-concussion symptoms reported. Data is collected from patient charts of individuals who have visited the Integrated Adult Concussion Clinic (IACC). The results do show a trend that supports the hypothesis that individuals with lower cumulative health, social and economic score, low SES group, are associated with a greater number of post-concussion symptoms reported. The low SES group had a higher percentage of individuals with more than half of the symptoms listed.

Author List: Lin, Jennifer YX; Sapiano, Laura JD; Atayde, Adrienne L; Malik, Shazia; Guay, Meghan M; Gamble, Teresa; Rathbone, Michel P

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4B06

Abstract Title: Understanding the perspectives of older female drivers who have undergone video-based feedback training: A qualitative study

Abstract Description (236 of 250 words):

Background: Women aged 65+ have one of the highest risks of an at-fault motor vehicle collision. Thus, improving their behind-the-wheel skills through driver training is an important strategy that can extend their years of safe driving. Recent research has identified video feedback as a promising approach to driver training for older adults.

Objectives: This study aimed to explore the perspectives of older female participants who underwent the Refreshing Older Adults Driving Skills (ROADSkills) program and received video feedback on their driving. Another aim of this project was to identify strategies to enhance the design and delivery of the ROADSkills program specifically for older female drivers.

Methods: Content analysis was used to identify themes from 5 semi-structured interviews conducted with female ROADSkills participants (aged 67-72). Purposive and convenience sampling strategies were used.

Results: Participants recognized the value of the ROADSkills program and, in particular, highlighted how the feedback they received improved driving performance. Some women indicated the video feedback was helpful whereas others found themselves questioning their behind-the-wheel abilities after undergoing the training. Participants ranged in their opinions on their overall training experience in the program, with some expressing the desire to continue the conversation on their driving.

Conclusion: Understanding why older female drivers valued their participation in such driver training, how they internalize feedback on their behind-the-wheel behaviour, and their specific preferences for receiving such feedback informs how the ROADSkills program can be delivered going forward.

Author List: Liu, Kristy; Sangrar, Ruheena; Vrkljan, Brenda

Author List in full: Kristy Liu, B.Sc.Kin(c)1; Ruheena Sangrar, PhD(c), OT Reg. (Ont.)2; Brenda Vrkljan, PhD, OT Reg. (Ont.)2 1Faculty of Health Sciences; 2School of Rehabilitation Science, McMaster University.
Course Code: HTHSCI 4A15

Abstract Title: Determining the Pathway of CHOP Upregulation in Ischemic AKI

Abstract Description (maximum 250 words):
Acute kidney injury (AKI) is a disease associated with high mortality rates, claiming 1.7 million deaths per year worldwide1. CHOP is an important transcription factor induced in ischemic AKI (kidney injury caused by reduced blood flow to the kidney) that promotes cell apoptosis2. Some studies hypothesize ischemic AKI is associated with the aggregation of misfolded proteins in the endoplasmic reticulum (ER), a phenomenon known as ER stress, as CHOP is a well-known ER stress biomarker3. However, other conditions such as amino acid deprivation and oxidative stress can also cause CHOP upregulation2. The main objective of this study was to determine the pathway through which CHOP is upregulated in ischemic AKI in order to identify possible therapeutic targets to combat the disease. To investigate the pathophysiology of CHOP upregulation, mouse models were used to replicate ischemic AKI by clamping the renal arteries of the mice4. Wild-type (WT) and CHOP knockout (CKO) mice were split into sham and bilateral renal ischemia reperfusion surgery groups. Western blotting, Periodic acid-Schiff (PAS) staining, and creatinine analyses showed that WT ischemic mice experienced more damage to kidney tissue than did CKO ischemic mice and also displayed elevated levels of CHOP and P-ERK, a protein in the pathway of ER stress, upstream of CHOP5. Additionally, 4-phenylbutyrate, a chemical chaperone that mimics the CKO effect, likely provides protection against AKI-induced damage through ER stress inhibition. Taken together, these results indicate that the pathway of CHOP induction in ischemic AKI is ER stress via the PERK pathway.

Author List: Liu, Sarah; Carlisle, Rachel; Dickhout, Jeffrey

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown

References:
Course Code: HTHSCI 4A15

Abstract Title: “IT MEANS SOMETHING TO US”: EXPERIENCES OF ADULTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES AS PATIENT EDUCATORS

Abstract Description (maximum 250 words):

Introduction: Research shows roleplay in medical schools has personal benefits for standardized patients (SPs), including improved confidence interacting with healthcare professionals. Though some medical schools engage adults with IDD as SPs, there is an absence of research exploring how simulation experiences impact them.

Objectives:
1) Learn from the experiences of adults with Intellectual and Developmental Disabilities (IDD) when they participate as Patient Educators (PEs) in roleplay scenarios with medical students, and
2) Confirm they benefit from simulation work.

Methods: An Objective Structured Clinical Exam (OSCE) was developed with 5 PEs recruited from the Niagara region. OSCEs assess medical students’ clinical and communication skills through one-on-one interviews featuring clinical cases. PEs attended 3 preparation sessions. PEs and trainers co-developed simulation scenarios using personal experiences, adjusted to ensure anonymity.

Twenty-two McMaster medical students were recruited from the Hamilton and Niagara campuses. The OSCE design included 5 stations (7-minute one-on-one interaction, 2 minutes of verbal feedback and 3 minutes for written feedback per station), and 2 iterations were performed at each site.

PE experiences are being explored through written and verbal feedback from semi-structured one-on-one interviews, OSCE sessions and focus group sessions following each set of OSCEs. Narrative content will be qualitatively analyzed to allow us to learn from those with IDD.

Results: Preliminary results suggest PE experiences are positive overall, and OSCE participation led to self-empowerment and personal discoveries. Challenges for PEs with IDD were identified (including memorization). Limitations include the small cohort size and focus on a single evaluation type.

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Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): ¹McMaster University, ²Best Practice, ³University of Toronto, ⁴Bethesda Services
Abstract Title: Does Smoking Increase the Risk for Neoplasia in Patients with Inflammatory Bowel Disease?

Abstract Description (maximum 250 words):
Smoking and inflammatory bowel disease (IBD) have both been described as risk factors for colorectal cancer (CRC). However, whether smoking further increases the risk of CRC in patients with IBD is not clear. This study aims to understand whether active smokers with IBD have an increased likelihood of developing CRC or dysplasia compared to never smokers and ex-smokers with IBD. This was a retrospective study of IBD patients seen at McMaster University Medical Centre, Hamilton, ON, Canada from 2012 to 2018. The primary outcome was development of any neoplasia, including colorectal cancer, low or high-grade dysplasia present on biopsies in the colon, or adenomas. Current smokers were compared to ex-smokers and never smokers for development of the primary outcome of interest. A total of 721 patients were included in the analysis, of which 91 were active smokers (12.6%), compared to 116 ex-smokers (16.1%) and 514 never smokers (71.3%). A total of 31 patients developed the primary outcomes of dysplasia (N=15), adenoma (N=11), or CRC (N=7). After adjustment for IBD type, active smokers still had increased odds for development of neoplasia compared to ex- or never smokers (OR 3.8, 95% CI 1.5-9.7). Active smoking status was associated with increased odds of neoplasia in IBD patients, after adjustment for covariates. Patients with IBD should be counselled regarding the importance of smoking cessation. Further prospective data are needed to confirm the impact of smoking on neoplasia risk in IBD patients.

Author List: Fadida, Ma’ayan; Reza, Samiha; Chattha, Rimsha; Moradshahi, Mehrshad; Dezfooli, Nazanin; Chattha, Zemrah; Piracha, Yasir; Mann, Ruby; Sambhi, Gagan Deep S.; Chauhan, Usha; Halder, Smita; Marshall, John K.; Narula, Neeraj

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A15S

Abstract Title: Matching with Compatibility Constraints

Abstract Description (maximum 250 words):
The Canadian medical residency match has received considerable attention in the Canadian medical community as several students go unmatched every year. Simultaneously, several residency positions go unfilled, largely in Quebec, the Francophone province of Canada. The Canadian match is unique in that positions are designated with a language restriction, a phenomenon that has not been studied or described priorly in the matching literature. To study this phenomenon, we develop the model of matching with compatibility constraints, where based on a binary characteristic, a subset of students is incompatible with a subset of hospitals. We show that while the deferred acceptance algorithm still yields a stable matching, some desirable properties from standard two-sided matching are lost. For instance, we show that if the number of residencies exceeds the number of students, some students can yet go unmatched. We also investigate a dynamic game where unmatched positions are re-advertised without language restriction. The model can be generalized to other instances of the stable marriage problem.

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Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A12

Abstract Title: The Social Determinants of Sepsis: A Retrospective Chart Review Study

Abstract Description (maximum 250 words):

Background
Sepsis is a life-threatening condition characterized by organ dysfunction caused by a dysregulated immune response to infection. Sepsis is the 12th leading cause of death nationally, and it is estimated that 30,000 Canadians are affected by sepsis each year. It also carries enormous financial costs and is an immense burden on the healthcare system, as most septic patients require ICU stays. Social determinants of health are known to be implicated in various health conditions. Most research has focused on biological risk factors associated with sepsis, and there remains a gap in the literature of inquiry into the relationship between social determinants of health and sepsis.

Objective
This study aims to elucidate the relationship between certain social determinants of health and the development of sepsis in adults in Hamilton, Ontario.

Methods
Patients were selected from a critical events database held by Hamilton Health Sciences. Cases (n = 100) and controls (n = 200) were matched 1:2 for Charlson Comorbidity Index to reduce the potential for confounding. Data was uploaded to RedCap and downloaded as an Excel Workbook for analysis. Summary statistics were performed, and full data analysis will be done using multiple logistic regression analysis in SPSS.

Discussion
This study will be the first to determine the relationship between social determinants of health and sepsis. The knowledge gained by this study can be used to further public health efforts and improve population health. Additionally, it will inform clinicians of the various risk factors to consider when admitting patients.

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Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 3H06

Abstract Title: Mobile Health Interventions for Menopause: A Literature Review

Abstract Description (maximum 250 words):

Background: The shift into the digital age has resulted in the mass production and release of mobile health (mHealth) interventions. mHealth interventions have already been successfully used to improve health outcomes of patients with chronic diseases and stigmatized conditions such as HIV/AIDS. More recently, mHealth interventions have been used in menopausal treatment, but little is known about the present status of such interventions. This study aims to summarize the current state of mHealth interventions for menopausal treatment.

Methodology: Multiple electronic databases (EBSCOhost including Medline, PubMed, and Proquest), and a menopause specialized journal were selected to search for articles related to mHealth interventions targeting menopausal health.

Results: 14 papers were included in this study. Among these 14 papers, 5 studies examined the feasibility and usability of mHealth interventions, 3 studies explored the effectiveness of the mHealth interventions, including increased knowledge, improved decision making, and increased treatment adherence. 2 studies also supported the use of mHealth interventions in the treatment of other diseases. Interestingly, 5 studies demonstrated the success of mHealth tools as a data collection method. 1 study reported that 67.6% of participants preferred face-to-face support as opposed to mHealth tools, while another study reported that 57% of participants preferred mHealth tools to pen and paper.

Conclusion: mHealth tools can be used to improve patient outcomes in menopausal women through educating patients, increasing treatment adherence, and routine monitoring. There is a need to further engage the menopausal age group using mHealth interventions in order to better tailor healthcare for women.

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Course Code: HTHSCI 4A09

Abstract Title:
Benefits of Specialized Training Program for Swim Instructors of Students with Intellectual Disabilities

Abstract Description (maximum 250 words):
Participating in physical activities enhances both physical and psychological health of individuals with intellectual and developmental disorders.1 However, only 10.7% of these individuals meet the global recommendations for physical activity for health.2 One barrier to participation in activities (e.g. swimming) is the insufficient training of instructors to teach these individuals.3 Our study examines the effectiveness of a specialized training program for swim instructors on improving their intentions, attitudes and competence towards teaching students with IDD, as well as assesses the most useful techniques for these instructors. Participants included 4 Tidal Waves swim instructors (mean age: 19; 75% female). Instructors’ intentions, attitudes and competence towards teaching individuals with IDD were assessed using a modified version of the Physical Educators’ Intention Toward Teaching Individuals with Disabilities-III questionnaire (PEITID-III). Training covered the range of difficulties experienced by individuals with IDD, as well as positive behavioural support skills for instructors. Swim lessons was recorded to observe instructors’ use of taught techniques. Results showed that instructors’ attitudes and competence increased but was not significant, and instructors’ intentions remained consistent before and after training, at the highest level possible. All of the instructors utilized at least one of the taught positive behavioural support skills in their lessons, with demonstrations being the most frequently used (36%). These findings suggest that more research is needed to illustrate the importance of special training for individuals who instructor adults with IDD. It is crucial for swim instructors receive proper training so any individuals with IDD can receive effective swim lessons.

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Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown

References
**Course Code:** Unknown

**Abstract Title:** Investigating the functional implications of T cell reprogramming on memory B cell responses

**Abstract Description** (maximum 250 words):
Food allergy is an increasing health concern in Canada with 7.5% of the population self-reporting at least one allergy. Adaptive immunity is the primary branch of the immune system that has been implicated in mediating the specificity and memory of allergic disease. Interactions between B and T cells – key players in the adaptive immune framework – lead to the production of antigen-specific IgE which can bind to high-affinity IgE receptors (FcεRI) on mast cells. The subsequent cross-linking of antigens by IgE bound to mast cells results in degranulation of these cells and the release of mediators that lead to inflammatory responses of allergy. The signalling pathway along the IL-4/IL-13 axis has been implicated in the cross-talk between B and T cells that leads to the development of allergy. The purpose of this project was to characterize the cellular and molecular level changes undergone by B cells as a result of blocking the IL-4/IL-13 axis in order to understand the changes to allergic memory as result of blocking this pathway.

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Abstract Title: Pediatric Eye Health: An investigation of parental awareness of children’s Eye Health in Hamilton, Canada (PACE)

Abstract Description (maximum 250 words):
Introduction: Our study, PACE, is an investigation of the parental awareness of children’s eye health in Hamilton, Canada. Objectives: This study primarily aims to assess knowledge in multiple domains of eye health, including common childhood eye conditions, eye care services, and perceptions surrounding eye care. Secondary objectives include identifying specific factors contributing to a lack of awareness and potential barriers to accessing quality eye care as well as maintaining compliance. Study Population: A participant will be included if they are parents/guardians above the age of 16 and provides consent. They must also have a child enrolled in an elementary school of the Hamilton Wentworth District School Board or Hamilton Wentworth Catholic District School Board. Methods: This is a cross-sectional study that will examine the awareness of parents in regards to pediatric eye health in the community of Hamilton, Ontario. The project involves the administration of an anonymous questionnaire consisting of multiple-choice, fill-in-the-blank, and select all that apply questions. In order to test the validity of this new questionnaire, it will undergo pilot testing. Pilot testing will consist of distributing the questionnaire to a small subset of the target population, waiting 3 weeks, and then re-distributing the questionnaire to ascertain test-retest reliability. All data will be collected on the online software REDCap. Future Directions: The study results will be used to identify potential factors contributing to a lack of awareness and obstacles to compliance, ultimately guiding interventions to bridge gaps in eye care.

Author List: Maqsood, Asma*; Stocks, Emilyanne*; Su, Raymond*; Qu, Tracy*; Nash, Dallas; Dr. Sabri, Kourosh
*All members contributed equally to this project*

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Abstract Title: Understanding National Barriers to Climate Change Adaptation for Public Health: A Global Survey

Abstract Description (maximum 250 words):

Background: Climate change has introduced a series of unprecedented threats to human health, ranging from rising food and water insecurity to deteriorating air quality and intensifying disease outbreaks and natural disasters. In the wake of this crisis, governments have been encouraged to devise strategies to build national resilience to the health impacts of climate change—a process referred to as climate change adaptation (CCA) and now widely acknowledged as an essential facet of any comprehensive climate response. Yet despite international pressure, prior research has revealed vast shortcomings in national CCA for public health progress. Thus, we set out to uncover the major governance constraints underlying these trends.

Methods: A mixed-methods online survey was distributed to representatives of national public health associations and societies of 82 member countries under the World Federation of Public Health Associations.

Results: 9 of the 11 respondent countries (82%) affirmed the existence of both an official CCA plan at the national level and an explicit public health focus within the national CCA agenda. The major identified barriers to CCA for public health progress were lack of inter-government policy coordination and insufficient political will to mobilize human and non-human resources in support of public health-oriented adaptation efforts.

Conclusions: These findings contribute to the research literature on governance barriers to CCA for public health by providing unique cross-country data to support the mapping of global trends. Above all, they highlight the need for new platforms for organizational collaboration/networked governance and enhanced forums for CCA agenda-setting and ambition-raising.

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Abstract Title: Gender-Affirming Practices in Primary Care: A Pilot & Evaluation of Hamilton Trans Health Coalition’s Online Learning Platform

Abstract Description (maximum 250 words):
Hamilton Trans Health Coalition (HTHC) is a group of health care providers, advocates, and community members working together to increase Hamilton’s capacity to deliver high-quality gender-affirming healthcare. For the past two years, HTHC has been developing a course for healthcare providers. The course is theory-driven, is rooted in the best current evidence, and is informed by lived experiences of those accessing care in Ontario. It was designed with four learning objectives in mind: 1) Deepen providers’ clinical/cultural knowledge; 2) Develop providers’ awareness of their attitudes, biases, and subjective norms; 3) Increase providers’ willingness to provide gender-affirming care; 4) Equip providers with the skills to provide gender-affirming care with self-efficacy.

HTHC conducted a month-long pilot to assess 1) How well the course helps providers retain information, 2) The extent to which the course accomplishes its four learning objectives, 3) the extent to which the course engages learners. Data was collected through quizzes; reflections based on the Atkins & Murphy model; feedback forms based on Stephen Brookfield’s Critical Incident Questionnaire; and self-evaluation surveys.

Pilot results indicate that the course can successfully teach concepts to its learners, though it is still uncertain whether these concepts will be retained in the long term. Further investigation with a larger sample may shed further light on this. The course has been shown to improve the participants’ sense of self-efficacy, though the magnitude of this improvement was moderate. Furthermore, some participants have commented that the course should focus more on developing skills and less on changing perspectives.

Author List: Adrian Marcuzzi\textsuperscript{1,2}; Project Supervisor: Cole Gately\textsuperscript{2}; Community Partner Liaison: Simon Lebrun\textsuperscript{2}

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Course Code: Unknown

Abstract Title: Evaluating the Role of a Multi-Ingredient Nutritional Supplement in Mediating Weight Loss in Obese and Overweight Individuals

Abstract Description (maximum 250 words):
Given the increasing prevalence of obesity over the past decades, there has been an eminent need to address this crisis. The current study explores a multi-nutrient supplement and its potential to promote/enhance fat loss and weight management in healthy individuals. When examining this supplement in a murine model, it was observed that mice receiving a high fat diet had the ability to lose a significant amount of their fat mass, with minimal change to muscle mass. We conducted a randomized, placebo controlled, double blind clinical trial. 158 potential subjects were screened, 67 of which met our eligibility criteria and proceeded to enter the trial. Participants attended study follow-up visits at 2 weeks, 7 weeks, and 90 days from baseline. During visits, a combination of anthropometric, metabolic, blood, and other health assessments were conducted on patients. Anthropometric measurements included weight, height, waist and hip circumferences, as well as DXA scanning. Resting metabolic rate was determined, along with respiratory exchange ratio, and VO2max data. Blood analyses included metrics of liver functioning, fasting glucose, complete blood count, and fatty acid markers. Participants also completed dietary and activity logs, to control for extraneous changes that might impact their weight management. At the present, the final cohort of 12 participants is nearing completion of the trial, after which, the data may be unblinded. Thus far, compliance has been satisfactory at around 87 percent.


Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** Unknown

**Abstract Title:** Unknown

**Abstract Description** (maximum 250 words):

*Background:* The etiology and pathogenesis of developmental dysplasia of the hip (DDH) are not clear. This scoping review examines all genes, loci, polymorphisms and genetic associations reported in relation to DDH.

*Methods:* MEDLINE (OVID interface 1948 and onwards), Embase (OVID interface, 1980 onwards), and the Cochrane Central Register of Controlled Trials (Wiley interface, current issue) were systematically searched to yield the results for this review.

*Results:* 39 studies were included. Case-control candidate gene association studies and genome-wide association studies (GWAS) made up the majority of studies included in this review. GWAS’s were of moderate to good quality. Studies reported risk using odds and risk ratios, and LOD (logarithm of the odds) scores. Most studies focused on reporting susceptibility to DDH based on the prevalence of SNPs in DDH-affected family members, and patterns of inheritance. We summarized genes positively and negatively associated with DDH. Chromosomes 1, 3, 9, 17, and 20 were the chromosomes most frequently reported on in the studies included in our review.

*Conclusion:* There are no conclusive reports of a causal relationship between a specific gene or SNP and DDH. The pathology of DDH is likely due to a multifactorial model of predisposition, however the role of heredity, the mechanism and mode of inheritance, and the effect of genetics on pathology require further elucidation. The literature points to the need for more GWAS’s with large sample sizes and high methodological quality in order to further understand the genetic etiology of DDH and prompt the development of different approaches to newborn screening.

**Author List:**
Matthews, Ceilidh
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**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Abstract Title: Characterization of retinal microvascular complications and the effects of endoplasmic reticulum stress in mouse models of diabetic atherosclerosis

Abstract Description (maximum 250 words):
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.

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References
Course Code: HTHSCI 4A15

Abstract Title: Music Care Partners: a Music and Mealtime Initiative at St. George Care Community

Abstract Description (maximum 250 words):
The purpose of this study is to investigate the impact of music care on isolation and loneliness in 24 long-term care (LTC) homes in Toronto, Hamilton, and Kitchener Ontario through the implementation of a program called Music Care Partners. This poster details the effects of the program at St. George Care Community (SGCC), a LTC home in Toronto, Ontario. The SGCC population is unique compared to the other 23 LTC homes as the majority of residents have a mental health diagnosis. In addition to isolation and loneliness, there is a high prevalence of aggressive behaviours at mealtime. Eighteen residents at SGCC participated in an eight week music care initiative where music was played in the dining rooms during mealtimes. The Friendship Scale was used to quantitatively measure social isolation pre- and post-intervention. Resident Assessment Instrument – Minimum Data Set 2.0 (RAI-MDS 2.0) scores were collected pre-, mid- and post-intervention. Qualitative data in the form of interviews was collected to determine the barriers and enablers of the program implementation. There were positive changes in both Friendship Scale and RAI-MDS 2.0 scores. Staff and residents alike expressed how music care positively influenced life at the home during interviews. The quantitative and qualitative observations show that music care made a difference in the quality of life of residents at SGCC. Furthermore, Music Care Partners showed that music care was effective in mitigating social isolation and aggressive behaviors at SGCC.

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Course Code: Unknown

Abstract Title: Bidirectional immune-microbe communication: role of T lymphocytes

Abstract Description (maximum 250 words):

Background: There is a growing amount of literature implicating the potential influence of bidirectional communication between microbes and T cells on behaviour. T cell deficiency has been shown to lead to reduced anxiety-like behaviours and sex-related differences in brain structure (Rilett et al., 2015). Further, T cell deficient mice show increased levels of stress hormones and an exaggerated response to stress. These influences are of particular interest during puberty, due to the vulnerability of the brain and the immaturity of the gut microbiota during this time period (Yahfoufi et al., 2020). However, the specific microbe-immune cellular mechanisms that underlie these behavioural differences have not been identified in the literature.

Purpose: The objective of this study is to elucidate the differences in gut microbiome composition associated with differences in anxiety-like behaviour between wild type C57Bl/6 (WT) and T cell receptor double knock out mice (TCRβ-/δ-/-) mice before and after puberty.

Methods: TCRβ-/δ-/ - and WT mice were subject to behavioural testing before and after puberty (at four and eight weeks respectively). Measurements analyzing anxiety-like behaviour were conducted, included elevated plus maze and open field tests. Fecal samples were collected on postnatal days 28 and 56. Extracted fecal DNA were amplified and sequenced with the Illumina MiSeq platform at the 16S rRNA gene variable 3 (v3) regions. MiSeq data was processed using an in-house bioinformatics pipeline.

Results: Preliminary data analysis suggests that TCRβ-/δ-/ - mice have lower alpha diversity (Shannon) compared to WT mice. TCRβ-/δ-/ - and WT mice demonstrated distinct OTU clustering in a PCoA plot using the Jaccard index. Between-strain differences were present before and after puberty.

Conclusions: Preliminary findings validated previous results from the Foster laboratory that found differences in alpha diversity between TCRβ-/δ-/ - and WT mice using Chao1 and Shannon distance matrices, as well as differences in beta diversity using the Bray-Curtis dissimilarity index. These results suggest that T cell-microbe interactions play a role in anxiety-like behaviour in mice. Further analyses will be conducted to examine the relative abundance of specific taxa in TCRβ-/δ-/ - mice.

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References:
Course Code: HTHSCI 4B06

Abstract Title: To Adhere, or Not to Adhere, That is the Question: Exploring topics of nonadherence through the analysis and creation of patient narratives

Abstract Description (maximum 250 words):
Approximately 50% of patients with chronic illnesses are nonadherent, and as many as 70% can be nonadherent when treatment regimens are complex or require difficult lifestyle changes. Nonadherence has commonly been assessed by analyzing factors associated with varying levels of patient adherence. However, these factors show little of the complexity involved with adhering to a treatment plan from initiation to discontinuation. In order to thoroughly understand the topic of patient adherence, it is necessary to explore the patient’s personal experiences, beliefs, and values. Through honest patient stories, it becomes possible to exemplify the challenges and barriers that patients face when adhering to treatment regimens. In this report, stories and essays of health and illness were analyzed for narrative elements that provide an authentic glimpse of the patient story. The narrative elements were then used to create three unique narratives of patient nonadherence: A Full Closet, On the Mend, and One Pill, Two Pill, Red Pill, Blue Pill. These narratives aimed to explore different factors of nonadherence, different patient populations, and different narrative formats. Through both the analysis and creation of narratives focused on the patient experience, this report sheds light on the complex and multifaceted problem of nonadherence.

Author List: Alexi Michael, Robert Spree

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Course Code: Unknown

Abstract Title: Retrospective Chart Audit Analyzing the Functional Status of Children with A Diagnosis of Autism Spectrum Disorder (ASD) or Fetal Alcohol Spectrum Disorder (FASD) Using the International Classification of Functioning, Disability and Health (ICF).

Abstract Description (maximum 250 words):
Background: Autism Spectrum Disorder (ASD) and Fetal Alcohol Spectrum Disorder (FASD) both impact an individual’s functionality, yet little is known about how they impact functionality, and possible similarities/differences in how they impact functionality. Objectives: We examined the functionality of children with a diagnosis of ASD or FASD using the International Classification of Functioning, Disability, and Health (ICF). Methods: We conducted a retrospective chart review of 25 patients with a diagnosis of ASD and 25 patients with a diagnosis of FASD. The two study groups were age and sex-matched. Major concerns related to functionality within the domains of body function, activities and participation, environmental factors, and body structure were recorded and linked to the ICF model, which provides a unique bio-psycho-social overview of an individual’s functionality. Results: Within both the ASD and FASD groups there were 14 males (56.0%) and 11 females (44.0%). The mean patient age at the time of their last consultation was 10.6 with an age range of 4 to 17 years of age. In the ASD group the most frequently reported concerns related to functionality were mental functions (23 patients, 92.0%), communication (18 patients, 72.0%), and self-care (18 patients, 72.0%). In the FASD group the most frequently reported concerns related to functionality were mental functions (25 patients, 100.0%), self-care (17 patients, 68.0%), and general tasks and demands (16 patients, 64.0%) Conclusions: Patients in the ASD and FASD groups experience many of the same challenges related to functionality.

Author List: Moore, Connor & Kraus De Camargo, Olaf.

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4C12

Abstract Title: Health System Transitions for Adolescents with Eating Disorders: A Qualitative Assessment of Barriers and Facilitating Factors

Abstract Description (maximum 250 words):

Introduction: Transitions in care in the field of mental health are risky periods for negative outcomes, including treatment dropout, worsening of symptoms, and suicide.1 Specifically, transitions from pediatric health systems to adult health systems can cause increased levels of anxiety for patients and families.2 There is a dearth of research that identifies pediatric-to-adult health system transition practices that yield positive outcomes for young people with eating disorders. The purpose of this study was to understand adolescent and caregiver perspectives of: a) barriers and facilitators of a successful transition; and b) interventions for a successful transition.

Methods: We recruited five adolescents with eating disorders who were about to be transferred out of pediatric care as well as five caregivers. We conducted semi-structured interviews in accordance with the principles of interpretive description. Thematic content analysis identified participants’ perceptions of barriers, facilitators, and interventions regarding a successful pediatric-to-adult health system transition.

Results: From preliminary analyses, the following themes were identified as challenges during the transition process: lack of knowledge of transition practices, uncertainty surrounding parental involvement, and difficulties managing the demands of current treatment plans in addition to navigating transitions to adult services. Both young adults and caregivers expressed that early education about the transition, a Transition Coordinator, and a Transition Passport would be helpful in facilitating a seamless transition.

Conclusions: These findings demonstrate a significant gap in the system. The themes that emerged from this study can inform the development of interventions to facilitate a coordinated transition for adolescents with eating disorders.

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References:
Course Code: HTHSCI 4A12

Abstract Title: Talking the talk in junior interprofessional education: jargon or healthcare language?

Abstract Description (maximum 250 words):

Introduction: Use of jargon and complex healthcare terminology is a potential barrier to interprofessional education (IPE). Healthcare terminology can be separated into two categories: inclusive terminology shared amongst professions, and exclusive terminology unique to one profession. We sought to understand how complex terminology is perceived by junior learners in an IPE setting.

Methods: We conducted a mixed methods study involving medical, nursing, and physician assistant students attending IPE simulation workshops. Students reviewed scenarios used in the workshops and identified terminology they considered “inclusive” or “exclusive”. Then, students participated in focus group discussions surrounding attitudes/perceptions towards healthcare terminology.

Results: 23 students analyzed 14 cases, identifying on average 21 terms per case as healthcare terminology (29% of overall word count). Of the 290 terms identified, 113 terms were classified as healthcare terminology, 46 as inclusive and 17 as exclusive by >50% of participants. Analysis of focus group transcripts revealed 4 themes: abbreviations were commonly perceived as complex terminology, unfamiliarity with terminology was often attributed to being early in training even if exclusive, simulation was considered a safe space for learning, and learning terminology was a valued objective in early IPE.

Conclusions: Students perceive a lot of healthcare terminology in learning materials, which is recognized as a valuable learning objective in their early IPE experiences, but also a challenge. Categorization of healthcare language is inconsistent among students and may reflect individual differences in prior experiences. Overall, healthcare terminology is a valued desirable difficulty among junior learners, and should not be avoided in IPE.

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Abstract Title: Determining Cut-offs to Define Compliance when Assessing Complex Multi-Component Quality Improvement Bundles

Abstract Description (maximum 250 words):

Objective: To best determine how to assess, report and define compliance for a multi-component quality improvement clinical bundle.

Methods: Data was collected prospectively and control charts were produced in real-time to analyze each bundle. Various initiatives were undertaken during the intervention phase in order to optimize compliance rates. Patterns of non-compliance were measured to guide the creation of strategies to decrease associated discrepancies.

Results: Full compliance rates were not able to be optimized at better than 50-60%. Partial and full compliance rates increased steadily at MCH and LHSC until the uptake of each bundle plateaued compliance.

Discussion: A threshold of 67% was deemed as acceptable for bundles that are reported q4. Bundles requiring 2 reportings a day retained a 100% threshold. Findings were consistent amongst each bundle and reflected similar results as the control bundle. Past literature studies depicted comparable findings.

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Course Code: HTHSCI 4B06

Abstract Title: Medical Assistance in Dying and Roman Catholic Opposition in Ontario, Canada

Abstract Description (maximum 250 words):
In June 2016, medical assistance in dying (MAID) was legalized in Canada. A poll by IPSOS revealed that 86% of Canadians in early 2020 were supportive of MAID legalization. However, there are debates amongst those who support MAID—mostly concerning the eligibility criteria in Bill C-14, the federal legislation on MAID. Also noteworthy are those who voice their complete opposition of MAID. Such individuals include Catholic theologians and clergy. This paper first explores two recent historical court cases that heavily informed and continue to shape the MAID regime in Canada and the current Canadian setting including views from physicians, other experts and stakeholders, and the general Canadian public. It then explores Roman Catholic bioethics and some fundamental values in Roman Catholicism that jointly contribute to the prohibition of MAID in Roman Catholic doctrine. Finally, the paper details how Canadian Catholic clergy deal with Canadian Catholic laity—86% of whom support MAID legalization—and how conscientiously objecting healthcare providers deal with MAID-requests by their patients. In general, it seems that both the federal government and the Canadian public are increasingly moving towards the expansion of the MAID regime, with Bill C-7 having been tabled in February 2020 to decrease the stringency of some eligibility criteria in Bill C-14.

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**Course Code:** Unknown

**Abstract Title:** Employing Eye Tracking Technology to Understand How Novices Learn Neuroanatomy

**Abstract Description** (maximum 250 words):
Neurophobia, the fear of neuroscience, is a barrier to student success in neuroanatomy. A preliminary study suggests that individuals with low working memory capacity (WMC) benefit from using high-contrast images when learning neuroanatomy, but the reason is unknown. This study employs eye-tracking technology to understand how individuals of varying WMC study neuroanatomical images.

Undergraduate students with no prior anatomical education (n=118) were given five minutes to study twelve neuroanatomical structures on four digital brain slices (either coronal/transverse slices in high/low contrast), then asked to identify learned structures on similar low-contrast images. This procedure was repeated such that participants were exposed to sets of coronal/transverse and high/low contrast images in a randomized fashion. After testing, participants completed the Automated Operation Span Task (OSPAN) to quantify WMC. Data was collapsed across slice orientation and split into tertiles based on accuracy scores to analyze the influence of accuracy and contrast on gaze patterns. No statistical differences were found in gaze patterns based on accuracy or contrast (F(8,216) = 0.319, p = 0.958, η² = 0.023). Assessed gaze pattern metrics include: interest area (IA) dwell % time, IA first fixation time, IA fixation count, and average fixation duration.

Results demonstrated no effect of accuracy or contrast on students' gaze patterns, which offers quantitative insight into how neuroanatomical information is viewed and learned. Future directions seek comparative data from experts to examine gaze patterns as a physiological measure of expertise, with hopes of influencing future teaching practices in neuroanatomy.

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Course Code: HTHSCI 4A15

Abstract Title: Quantitative Data Collection to Enhance a Heart Failure Self-Care Application

Abstract Description (maximum 250 words):
Heart failure (HF) is a global pandemic afflicting 1% of Canadians1,2. Following hospital discharge, up to 50% of older patients diagnosed with HF are readmitted to the hospital within 3 months2. HF self-care can reduce HF-related hospitalizations and mortality3. One important aspect of HF self-care is weight monitoring4. Demers et al. conducted a pilot RCT showing that a standardized diuretic tool (SDDT) could significantly improve patient self-care compared to usual care (P= 0.005)5. Currently, the SDDT is being translated into a HF mobile health (mHealth) self-care app capable of promoting self-care in the home setting for older patients with HF. The study objective was to identify, and document patient needs when using a HF related self-care application. 43 out of 260 Male and female patients aged ≥ 60, clinically diagnosed with HF were recruited from the 4 East clinic of Heart Function clinic, inpatient medicine and Cardiology wards at the Hamilton General site (Hamilton Health Sciences) from June 2019 to March 2020. Participants were administered the 65-Item Heart Failure Application Questionnaire (HFAPPQ) collecting data on patients needs for the heart failure application (HFapp).

Subsequently, mean responses and frequency distributions were calculated. Preliminary results demonstrated patient interest in using the HFapp for self-care especially if support from healthcare providers was provided. Participants also expressed interest in communicating with healthcare providers through the HFapp. Future directions include conducting usability trials with participants to test for ease of use as well as incorporating nurses and volunteers to aid in the HFapp setup.

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References:
Course Code: Unknown

Abstract Title: ELUCIDATING THE ROLE OF TESTOSTERONE IN DIABETIC NEPHROPATHY IN THE APOE-/- INS2+/Akita MOUSE MODEL OF DIABETES AND ATHEROSCLEROSIS

Abstract Description (maximum 250 words):

INTRODUCTION: Diabetic Nephropathy leads to glomerular hypertrophy and fibrosis, mesangial expansion and glomerulosclerosis. The Akita mutation, C(A7)Y in the Ins2 gene, causes misfolding of insulin and leads to hyperglycemia. Sexual dimorphisms in atherosclerotic progression in the Ins2+/Akita mouse model have been previously characterized; evaluation of the role of sex hormones is ongoing. Ins2+/Akita mice demonstrated glomerular hypertrophy and an increase in glomerulosclerosis/collagen deposition. The objective of this work is to characterize the role testosterone in diabetic nephropathy in the ApoE-/- Ins2+/Akita mouse model of diabetes and atherosclerosis.

METHODS: ApoE-/- and ApoE-/- Ins2+/Akita were either castrated or underwent sham operations. Mice were implanted with sesame oil (control) at 8 and 16 weeks. We are currently enrolling groups which receive 1.5 mg DHT (dissolved in sesame oil) implants at 8 and 1.5 mg at 16 weeks. We obtained serial Coronal Cross-Sections of Paraffin-embedded Right Kidneys from each mouse and performed Periodic Acid-Schiff staining with Mayer’s Hematoxylin Counter Stain. We randomly selected and analyzed 20 glomeruli cut at the vascular hillum for morphometric analysis in ImageJ/FIJI.

RESULTS & DISCUSSION: Our preliminary data shows that castration may decrease kidney weight and reduce glomerular cross-sectional area in the ApoE-/- and ApoE-/- Ins2+/Akita transgenic mice models; the effects of dihydrotestosterone supplementation are yet to be determined. Future analyses will also aim to assess levels of fibrillary collagen.

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Abstract Title: CHANGES IN PEDIATRIC-SPECIFIC INFORMATION IN DRUG MONOGRAPHS APPROVED BY HEALTH CANADA

Abstract Description (maximum 250 words):
Pediatric populations pose unique ethical challenges to drug research. Despite advocacy for labelling changes, it is well known that a large proportion of pharmaceuticals in the Canadian market do not supply adequate safety data or dosing recommendations for children. This study aims to investigate the differences between the quality and quantity of pediatric-specific information in both original and updated drug monographs approved by Health Canada. Updated drug monographs for new active substances (NASs) approved from January 2007 to December 2016 by Health Canada were systematically reviewed for pediatric data. All monographs that included pediatric-specific data were included and corresponding original labels were also appraised for pediatric-specific data. A total of 117 drug monographs were included in this study. Only 81 (69.2%) original labels included pediatric-specific data. 51 (43.6%) original drug monographs were approved for use in a pediatric group versus 67 (57.3%) updated drug monographs. It was found that 68 (58.1%) original labels included data sourced from pediatric trials as opposed to 83 (70.9%) updated labels. Moreover, 35 (29.91%) pediatric studies from original labels utilized clinical trials. This is in contrast to 60 (51.28%) pediatric studies from updated labels. While our study has demonstrated some improvement in quality and quantity of pediatric-specific information between original and updated labels, the improvement is insufficient. Given the available baseline data and the timeframe of up to 10 years between updates, there is a need for a national public policy strategy to incentivize drug research in children.

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**Course Code:** Unknown

**Abstract Title:** The Role of Growth Hormone/Insulin-Like Growth Factor-1 Axis in Adolescent Idiopathic Scoliosis: a comprehensive review

**Abstract Description** (maximum 250 words):

**Context:** Adolescent idiopathic scoliosis (AIS) is predominantly found in females between the ages of 11-18. Despite being the most common type of scoliosis, the aetiopathogenesis of the disorder remains unknown. Some studies have linked AIS with aberrant growth hormone (GH) or insulin-like growth factor (IGF-1) signalling, but the evidence base is inconsistent.

**Objective:** To conduct a comprehensive review to evaluate the role of GH/IGF-1 axis in AIS.

**Data Sources:** PubMed database was searched since its inception through December 1, 2019. Reviewers selected articles that evaluated GH/IGF-1 signalling in AIS.

**Results:** A total of 17 articles met the inclusion criteria. While some articles reported the serum levels of GH and IGF-1 in AIS patients, other papers examined single-nucleotide polymorphisms in GH and IGF-1 genes in AIS patients and controls. Studies reporting serum levels of GH reported inconsistent differences between AIS patients and controls. Furthermore, genetic association studies did not have a consensus on significant differences between AIS patients and controls in the prevalence of the GH and IGF-1 polymorphisms. Few studies also found statistically significant correlations between prevalence of certain genotypes and the Cobb angle (curve severity) among AIS patients.

**Conclusions:** There is inconsistent evidence regarding the association of GH and IGF signalling and gene polymorphisms with AIS. Further research needs to ascertain the role of GH/IGF-1 axis in AIS.

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Course Code: HTHSCI 4D15

Abstract Title: The Clinical Behavior & Surgical Treatment of Basal Cell Carcinoma & Squamous Cell Carcinoma: A Retrospective Review

Abstract Description (maximum 250 words):
Basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are the most common types of non-melanoma skin cancer. Family physicians and/or dermatologists often do not perform biopsies to make a definitive diagnosis before referring patients to the plastic surgeons. The standard practice is also still driven by institutional history and physician preferences. This study aims to examine the diagnosis, clinical behavior and surgical excisions of BCC and SCC at St. Joseph’s Healthcare Hamilton. A retrospective chart review of approximately 2500 patients 18 years of age and older who were consulted by three plastic surgeons for suspecting BCCs and/or SCCs between July 1, 2015 and February 21, 2020 is currently underway. Findings from this study will inform the surgeons about their practices as well as improve the quality of care received by patients.

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Course Code: HTHSCI 4A15

Abstract Title: A comparative genomic analysis for resolving polyphyly of genus Candida: Identification of molecular signatures specific for Candida sensu stricto and proposal to rename L. elongisporus to attain monophyly

Abstract Description (maximum 250 words):
The genus Candida is an extremely diverse group with its members lacking common evolutionary history. Due to its highly polyphyletic nature, species belonging to this genus exhibit extreme phenotypic and phylogenetic variability. With recent advents in genome sequencing technology, genomic data from 95 species from this group were analyzed to construct detailed phylogenetic trees and clarify relationships among Candida and other closely related taxa. Comparative genomic analyses were performed to determine molecular markers, in the form of conserved signature indels (CSIs), to assist in the demarcation of the genus Candida. This analysis has led to the identification of 54 CSIs that are specifically shared by species belonging to the Candida/Lodderomyces clade, with twelve CSIs shared by all ten members of this clade. Based on evidence from multiple lines of investigations supporting the existence of this distinct Candida/Lodderomyces clade, we propose that the genus Candida sensu stricto should only comprise of this clade that is defined by the identified CSIs, with C. tropicalis as its type species. All other species that are currently part of the genus Candida that do not belong to this clade should eventually be transferred to other genera. As this clade is polyphyletic, we also propose the transfer of L. elongisporus to the genus Candida. One or more CSIs that are specific for species within this clade may be used to molecularly confirm the placement of species into these clades. These molecular markers can provide foundational insight into biological and clinical characteristics that are definitive for Candida.

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**Course Code:** HTHSCI 4A09

**Abstract Title:** Investigating the relationship between early infant sleep patterns and atopic disease at 3 years of age

**Abstract Description** (maximum 250 words):

**Background:** Sleep is crucial for infant growth and cardiorespiratory, endocrine and neurological system development. In cross-sectional studies, shorter sleep duration and fragmented sleep in early life is associated with increased risk of atopic diseases, but little longitudinal data exists. This is particularly interesting during the time of circadian rhythm development at 12-16 weeks of age.

**Objective:** Investigate the relationship between infant sleep quality and duration at 12 weeks of age and the development of atopic disease (AD) by three years of age in infants enrolled in the Baby & Mi prospective cohort study.

**Methods:** The primary outcome of AD status at 3 years was determined by parental report of physician diagnosis of asthma or reactive airway disease, eczema, hay fever or allergy. Sleep quality and duration were assessed by questions from the validated Brief Infant Sleep Questionnaire (BISQ) in full-term, singleton infants at 12 weeks of age. The relationship will be calculated using a logistic regression, with AD dependent on sleep variables.

**Results:** As of February 2020, 158 participants completed the 3-year study visit. 40% of these infants presented previous or current AD, and 39% were classified as poor sleepers at 12 weeks, with mean (SD) sleep of 9.64 (1.43) hours. The relationship between sleep and AD will be reported, and potential covariates such as 3-year height and weight, breastfeeding duration, and AD status at 12 weeks will be examined.

**Conclusion:** This study will contribute to our understanding of sleep disturbances during the establishment of circadian rhythm and subsequent AD development.

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Course Code: Unknown

Abstract Title: Determining the Effects of Inhibitory Compounds on the UPR and Cell Death

Abstract Description (maximum 250 words):
Acute kidney injury (AKI), commonly associated with endoplasmic reticulum (ER) stress, is caused by various mechanisms, including antibiotics, non-steroidal anti-inflammatory drugs, cisplatin, and radiocontrast. Tunicamycin (TM) is a nucleoside antibiotic that induces ER stress, and is a commonly used model of AKI. 4-phenylbutyrate (4-PBA) is a chemical chaperone and histone deacetylase (HDAC) inhibitor, and has been shown to have reno-protective properties in a TM model of AKI. The renal protection provided by 4-PBA is attributed to its ability to prevent misfolded protein aggregation and inhibit ER stress; however, the histone deacetylase inhibitor effects of 4PBA have not been examined in this model of AKI. The main objective of this study was to determine the effects of various inhibitory compounds on ER-stress. The FDA-approved histone deacetylase (HDAC) inhibitor vorinostat was used, as it has no ER inhibitory effects. In vitro work demonstrated that vorinostat did not prevent ER stress induced by TM. Vorinostat induced a significant increase in cell death, and exacerbated tunicamycin-mediated total cell death and apoptotic cell death. These data suggest that the protective mechanisms found by 4-phenylbutyrate are primarily due to its molecular chaperone properties rather than its HDAC inhibitor properties.

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Course Code: HTHSCI 4A09

Abstract Title: Literature Review: The Effects of Non-Abusive Physical Punishment by Parents Used on Children Below the Age of 12.

Abstract Description (maximum 250 words):
Many published studies have investigated and concluded that physical punishment such as spanking is correlated to increased problematic child outcomes like externalizing or internalizing behaviour.1-3 However, these studies often do not rule out a major confounding variable: abuse. The most recent review that focussed on child outcomes of primarily non-abusive physical punishment methods was conducted in 2000 by Robert E. Larzelere thus, an updated review is needed.5 MEDLINE via PubMed and PsycINFO via OVID were used in the literature search. Out of 315 articles published after the year 2000 investigating corporal punishment, 297 articles were excluded due to child’s age being greater than 12 years at time of punishment, punishment was too harsh, and abuse was not ruled out. This left a total number of 17 articles included in the literature review. Although there seems to be an increase in articles investigating physical punishment outcomes every decade, few established rigorous exclusion criteria by explicitly ruling out instances of abuse. Often, instances of child abuse start out as acts of “normal” child discipline.6 However, many countries such as Canada still allow corporal punishment under certain limitations.4 In order to clarify child outcomes from non-abusive physical punishment and to implement proper legislation and parenting recommendations, there is a need for investigators to establish methodological approaches to actively exclude instances of abuse.

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Course Code: Unknown

Abstract Title: Synthesis and Antimicrobial Activity of Metergoline Analogues

Abstract Description (maximum 250 words):
Salmonella Typhimurium is an intracellular pathogen that survives within host cells and can evade antibiotic treatment. A macrophage-based screen was developed and the ergot alkaloid metergoline was identified as a compound active against intracellular Salmonella. Here we report the synthesis of a series of new metergoline analogues and their evaluation against Gram-positive and Gram-negative bacteria.

Author List: Zoë Piquette, Jarrod W. Johnson, Michael J. Ellis, Kevin Xiao Tong Zhou, Caressa N. Tsai, Brian K. Coombes, Eric Brown, Jakob Magolan

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Course Code: HTHSCI 4B06

Abstract Title: Doing Things Right — A Podcast Series for Refined Daily Living

Abstract Description (maximum 250 words):
Daily activities have a significant impact on individuals' lives. Among the drastic changes that come with growing up, comfort in the consistency of daily activities can ground an individual. These activities include eating, socializing, sleeping, feeling, reading, and learning. They are part and parcel of everyday life. And yet, while a great deal of time is spent on them, their significance can get lost in a web of competition. For example, learning can be limited by a need to memorize a stack of concepts in a short amount of time for an exam. Healthy eating may suffer at the hand of exhaustion. In circumstances such as these, daily activities may cause more stress and harm than comfort and consistency. This five episode podcast miniseries is catered to Ontario listeners in their late teens to late twenties. Each episode focuses on one daily activity, covering learning, feeling, reading, doctoring, and eating. Secondary research and primary interviews offer a look at daily activities, pitfalls within them, and strategies for how they can be optimized for benefit. Key takeaways across all five episodes include the following: (1) it is easy to adopt a “laissez-faire” mindset and overlook the potential for benefit in daily activities, (2) the way a daily activity will impact an individual depends on both external and internal factors, and (3) individuals can and should divert energy towards changing their daily activities to improve their livelihood.

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**Course Code:** HTHSCI 4A15

**Abstract Title:** Expression of CD56 and CD16 Do Not Define NK Cell Functional Fate.

**Abstract Description** (maximum 250 words):
Expression of the surface markers CD56 and FcγRIII CD16 are 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 phenotype can in fact reliably inform NK cell functional fate. Here we were able to convert immunoregulatory CD56superbrightCD16- uterine NK cells (uNK) to cytotoxic NK cells through the use of the K562 membrane-bound IL-21 feeder cell expansion protocol. These cytotoxic expanded uNK cells bear the same CD56superbrightCD16- phenotype as their unexpanded regulatory counterparts, emphasizing that phenotype does not distinguish function. CD56 expression may however indicate heightened activation as expanded uNK cells showed enhanced degranulation and IFN-γ secretion in the CD56superbright subset. Additionally, this heightened activation is unrelated to function, as unexpanded uNK cells had highest expression of the immunoregulatory cytokines VEGF, IL-10 and IP-10 in the CD56superbright population. Expression of CD16 also does not differentiate NK cell functionality as expanded uNK cells showed no significant difference in degranulation and IFN-γ secretion between CD16- and CD16+ subsets. The combination of CD56 and CD16 expression, therefore, does not distinguish regulatory from cytotoxic NK cells but rather CD56 brightness defines the most activated and functional NK cell population.

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Abstract Title: Noise in endoscopic sinus and skull base surgery operating rooms

Abstract Description (maximum 250 words):

Introduction: Noise levels in the operating room contributes to miscommunication among team members and may negatively impact patient outcomes. The study aimed to quantify noise levels during endoscopic sinus and skull base surgery. Additionally, a secondary aim was to understand how OR team members perceive noise during endoscopic sinus and skull base surgery.

Methods: Noise levels were objectively measured using the validated phone application SoundMeter X 10.0.4 (r1865) (Faber Acoustical, Utah, USA). Noise levels were measured at the ear level of the surgeon, scrub nurse, circulating nurse and anesthesiologist. At the end of each surgery, OR team members were asked to complete a six-question questionnaire about noise in the OR.

Results: One thousand four hundred twelve noise measurements were recorded across 353 trials. The loudest mean noise measurement was 84.51 dB at the ear level of the surgeon. Noise was significantly higher at the level of the surgeon in comparison to the scrub nurse (p = .000), circulating nurse (p = .000) and anesthesiologist (p = .000). Forty percent of questionnaire respondents believed noise was a problem and 38% stated that noise caused communication issues during surgery.

Conclusions: Surgeons and scrub nurses have significantly higher noise exposure in comparison to circulating nurses and anesthesiologists during endoscopic sinus and skull base surgery. For these members of the OR team, noise is also perceived as problematic and causing issues with communication. Mechanisms to reduce potential noise may be implemented to improve communication and patient outcomes in endoscopic sinus and skull base surgery.

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Abstract Title: The Design of Pediatric Type II Diabetes Patient Education Materials in Nutrition

Abstract Description (maximum 250 words):
Type II Diabetes (T2D) is a chronic health condition characterized by insulin deficiency or resistance that leads to hyperglycemia. Management guidelines for T2D recommend a healthy well-balanced lifestyle as one of the management pillars in addition to pharmacotherapy. However, lifestyle intervention materials are often presented in forms that young patients do not find engaging.

In 2013, the Pediatric & Adolescent T2D Program at McMaster Children’s Hospital created patient education materials based on what was the most current evidence base. Our group has recently assessed the quality of T2D care guidelines, and this project aimed to capture current research to update the educational materials for the program and create engaging documents that may maximize engagement with youth with T2D.

Information from high-quality guidelines reporting best practices for managing T2D in children and adolescents was used as the source for the updated materials. These resources were developed into print and video-module formats, which are effective and captivating means of information distribution to youth and families. PEMAT (Patient Education Materials Assessment Tool) and feedback from the Lab Group were utilized throughout the development of these materials, including the creation of transcripts, visual and voice-recordings as well as the final compilations.

The development of comprehensive state-of-the-art resource materials for the education of T2D patients and families will ensure that youth are engaged in their diabetes education and may maximize diabetes control and improve outcomes. The implementation and impact of these educational materials will be assessed further by engaging stakeholders including patients and families.

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Course Code: HTHSCI 4A12

Abstract Title: Cultural Competency in Undergraduate Health Education

Abstract Description (maximum 250 words):
In recognizing a lack of educational supports and interventions around cultural competency in the Faculty of Health Sciences, the following thesis project looked to address the gap through various approaches. First, the students conducted literature reviews to create a key framework to define ‘culture’ and ‘cultural competence’. The reviews also provided a foundational understanding of the current scope of research as well as future directions in this area. A survey study was then designed to assess existing cultural competence education in the School of Nursing at McMaster University. With the relevance and importance of cultural competency in the field of healthcare, the survey aimed to understand the influence of education on the level of cultural competence in the students. While the study was not carried out due to extenuating circumstances, a detailed proposal and implementation plan exists, which can be executed in the near future. Finally, in order to bridge the gap between academia and the community, a knowledge translation piece was pursued in the form of a conference organized by an external team called McMaster Cultural Competency Initiative. The event engaged a key expert and the student community to receive educational interventions and further their understanding of this topic. Through the multifaceted approaches of this thesis project, the students were able to recognize the complex nature of the topic of cultural competency and aimed to catalyze the necessary discussions to take place in a culturally diversifying undergraduate context.

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**Course Code:** HTHSCI 4A15

**Abstract Title:** The Effects of Cannabis on Medication-Assisted Treatment in the Opioid-Dependent Population

**Abstract Description** (maximum 250 words):

**Introduction:** The prevalence of opioid use disorder (OUD) in Ontario continues to increase. As a result, a rising number of patients are being treated with medication-assisted treatment (MAT) with opioid agonist therapies. With recent legalization of cannabis in Canada in 2018, it is important to explore how cannabis use impacts MAT outcomes in the OUD population, as current research shows conflicting results.

**Methods:** Data is taken from the Pharmacogenetics of Opioid Substitution Treatment Response (POST) study, where OUD patients receive MAT treatment. Information collected regarding marijuana cravings, MAT treatment history and self-reported cannabis use are used to define characteristics of both cannabis users and non-users within the POST population. Baseline information is also analyzed in a univariate logistic regression analysis to determine factors that are associated with ongoing opioid use at baseline.

**Results:** Overall use of cannabis does not significantly impact MAT outcomes. However, increased cannabis craving measured by the Short-Form Marijuana Craving Questionnaire (SF-MCQ) is associated with a slight increase in risk for ongoing opioid use. Longer duration in treatment and use of buprenorphine-naloxone rather than methadone is associated with a decreased risk for poor MAT outcomes.

**Discussion:** The results are currently inconclusive regarding whether cannabis has an impact on MAT outcomes. Although overall cannabis use had no significant impact in the analysis, higher levels of craving may affect MAT treatment outcomes. These results highlight the necessity to conduct additional analyses specifically within the cannabis using OUD population to draw more conclusive results.

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**Course Code:** Unknown

**Abstract Title:** IMPACT OF NIPPV VS. CPAP ON APNEA OF PREMATURITY: A SYSTEMATIC REVIEW AND META-ANALYSIS

**Abstract Description** (maximum 250 words):

**Background:** Apnea of prematurity (AOP) is common in preterm infants. Clinicians often utilize nasal intermittent positive pressure ventilation (NIPPV) to mitigate AOP, but its effectiveness compared to continuous positive airway pressure (CPAP) remains unclear.

**Objectives:** Systematically review the literature and analyze the impact of NIPPV vs. CPAP on AOP in preterm neonates.

**Methods:** Searched four databases for randomized control trials (RCTs) enrolling preterm infants with apnea comparing NIPPV and CPAP. Primary outcome was AOP frequency per hour with secondary outcomes including bradycardia and desaturation. Weighted mean differences and pooled odds ratios were calculated using RevMan5.3.

**Results:** Following eligible study screening and review, 8 were included in the primary outcome analysis, with risk of bias. NIPPV use was heterogeneous with respect to settings employed and synchronization. There was no difference in the mean number of AOPs per hour between NIPPV vs. CPAP (WMD -0.19; 95% CI -0.76-0.37; 8 studies, 456 patients). Similarly, no differences in desaturations (WMD 0.59; 95% CI -0.61-1.78; 3 studies, 150 patients) or bradycardias (WMD -0.32; 95% CI -0.65-0.02; 5 studies, 224 patients). However, the pooled OR of developing ≥1 episode of AOP decreased with NIPPV (OR 0.46; 95% CI 0.32-0.67; 10 studies, 872 patients).

**Conclusion:** NIPPV was not associated with decrease in AOP, desaturation or bradycardia episodes compared to CPAP, although post-hoc analysis demonstrated lower odds of developing ≥1 AOP episode. To what extent any clinical impact is related to NIPPV vs. increased mean Paw remains unclear and warrants further research.

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Course Code: HTHSCI 4A09

Abstract Title: Robust Demarcation of the Legionellales Order using Conserved Signature Indels as Phylogenetic and Molecular Markers to elucidate Evolutionary Relationships

Abstract Description (maximum 250 words):
The order Legionellales contains several clinically relevant genera and a number of species that can cause legionellosis, a severe variant of pneumonia, Pontiac fever and Q fever. Despite being well studied for their pathogenesis, the taxonomic and phylogenetic relationships of the Legionellales species are still ambiguous. As more species are being isolated, it is of great importance that a robust method is established to reliably distinguish and classify species. This study conducted comparative genomics and phylogenetic studies for 66 genome sequenced members of the Legionellales order by constructing phylogenetic trees and identifying novel molecular markers. A total of 76 conserved signature insertions/deletions were identified with specificity for at the order, family and genus level. Of these CSIs, 24 CSIs are highly specific for all genome-sequenced members of the Legionella genus and well supported by branching in the phylogenetic trees, demonstrating the monophyletic nature of this genus. 2 CSIs, which are specific for the Legionellales order, distinguish the members of this order, while 3 CSIs serve to distinguish members of the Coxiellaceae family. Finally, 7 CSIs and 9 CSIs are specific for and reliably demarcate the members of the Coxiella and Rickettsiella genera, respectively. These molecular markers provide a reliable and predictive method to elucidate the phylogenetic relationships between the species of this clinically relevant order. Furthermore, the specificity of these markers allows for the robust classification of newly discovered species, their use as potential drug targets for legionellosis, and to understand their key functional mechanisms these groups of species.

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Course Code: HTHSCI 4A15

Abstract Title: The impact of genetic variants in the prevention and treatment of obesity

Abstract Description (maximum 250 words): Obesity is a condition characterized by excessive fat accumulation that may be detrimental to one’s health. Environmental factors like diet and the “obesogenic” environment have helped propel this disease to epidemic proportions. Interestingly, individuals in these environments exhibit a broad range of body mass indexes (BMIs), indicating that biological factors (e.g. age, genetics) also play a key role in one’s propensity for obesity. Monogenic syndromes result from a genetic variation in a single gene and manifest alongside a distinct set of phenotypes. Oligogenic inheritance describes a trait influenced by a gene in addition to modifier genes and the environment. Non-syndromic monogenic and oligogenic obesity have implicated the leptin-melanocortin pathway and its crucial role in energy regulation. Polygenic obesity results from the interaction between a number of genetic variants and the environment. Predictors of obesity have been classified and tested to determine what dietary and physical activity adjustments produce the most effective BMI reductions. Current treatment options include behavioral interventions, pharmacological treatment and bariatric surgery. Genetic testing is a crucial future step that can be used to inform the personalized treatment of obesity (e.g. leptin therapy, POMC agonists). This requires the analysis and synthesis of multiple sources of information (e.g. polygenic risk scores, classic versus personalized medicine) but will have tremendous benefit in the long run at the population level.

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Course Code: HTHSCI 4A12

Abstract Title: A Systematic Review and Meta-Analysis of Pharmacological Interventions for Reduction of Weight Gain in People with Schizophrenia

Abstract Description (maximum 250 words):
Antipsychotic medications induce concerning weight gain in schizophrenic patients. The objective of this review is to determine effective adjunctive pharmacological interventions for preventing this weight gain. We searched the Cochrane Schizophrenia Group’s Trials Register for all randomized controlled trials examining any adjunctive pharmacological intervention for weight prevention in patients with schizophrenia or schizophrenia-like illnesses. As endpoint and change data were combined in the analysis, mean differences (MD) of the change from baseline were calculated using RevMan 5.3. Fifteen randomised controlled trials met the inclusion criteria for review (pooled n = 767) with fourteen being synthesized in a quantitative meta-analysis. Metformin may be effective in preventing weight gain (Weight: MD = -4.03, 95% CI -5.78 to -2.28; participants = 131; studies = 4; BMI: MD = 1.63 kg, 95% CI -2.96 to -0.29; participants = 227; studies = 5). Other agents that may be slightly effective in preventing weight gain include H2 antagonists (Weight: MD = -1.32, 95% CI -2.09 to -0.56; participants = 248; studies = 3), as well as monoamine modulators (Weight: MD = -2.04, 95% CI -3.07 to -1.01; participants = 135; studies = 4; BMI: MD = -0.68, 95% CI -1.01 to -0.35; participants = 135; studies = 4). Good quality evidence supports metformin’s effectiveness in preventing weight gain, while accumulating evidence supports the use of H2 antagonists and monoamine modulators. Interpretation of other agents is limited by the small number of studies. Future studies that are adequately powered, with longer treatment duration, will be necessary for establishing interventions.

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**Course Code:** HTHSCI 3H06

**Abstract Title:** Quality of Primary Care Received by Indigenous Peoples of Ontario

**Abstract Description (maximum 250 words):**
There are disparities in the quality of primary care received by the Indigenous and non-Indigenous populations of Ontario. The importance of quality of primary care has been described in literature, however this has not been explored in the lens of Indigenous health. Hence, a scoping review was performed in order to investigate the quality of primary care received by the Indigenous peoples of Ontario. A scoping review approach was chosen in order to provide a summary of the quantity and quality of current research. To conduct this review, a search of the current available literature on primary care in the Indigenous communities of Ontario was performed. Studies that pertained to this topic and were published in English were included. These studies were derived from four different databases (Medline, EMBASE, CINAHL/EBSCO and Web of Science) and many evaluated specific communities using a quantitative and qualitative approach. From this search, several themes were identified including inadequate preparation and training of health care providers, physician and nursing shortages, strategies associated with improved quality of care, management of mental health, disparities in health service delivery station types and ineffective primary care impacts on hospitalizations. The studies demonstrated a clear gap in the literature on the quality of primary care received by the Indigenous population of Ontario. Further research is necessary in order to outline the current quality of primary care and strategies that can be utilized to improve quality of care for this population.

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Course Code: HTHSCI 4A12

Abstract Title: Creation of an InterRAI Literature Applications Bibliography

Abstract Description (maximum 250 words):
A large population of senior residents are frail, vulnerable with complex social and medical needs. As a result, indicators have been developed to assess a variety of outcome measures. The InterRAI assessment systems (including the Minimum Data Sets) measures a person’s functioning and quality of life by assessing needs, strengths, and preferences. This assessment system informs and guides comprehensive care and service planning in community-based settings around the world. This InterRAI Applications Bibliography synthesizes the existing body of literature on the effectiveness of common quality indicators used globally. Over 1400 total articles were identified across all measures. Less than 900 articles were kept after screening. Amongst all measures, Pain, Falls and Cognitive Performance Scale returned the most results whereas some measures returned few to no results (Communication Scale, Pressure Ulcer Risk Scale). All citations were compiled in EndNote, allowing for an accessible and standardized format with effective and comprehensive citation data.

Author List: Zekun (Michael) Shi, Andrew Costa

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A15

Abstract Title: Investigating Bacteriophage Impact on P. aeruginosa Biofilms

Abstract Description (250 words maximum):

BACKGROUND: Pseudomonas aeruginosa is an opportunistic gram negative bacteria capable of forming biofilms, and is a leading cause of hospital acquired and chronic infections. Bacteriophages (phage) are a potential solution to antimicrobial resistance, capable of eradicating P. aeruginosa biofilms.

OBJECTIVE: Determine if phage that can infect stationary phase P. aeruginosa will be more effective at eradicating P. aeruginosa biofilms.

METHODS: Isolated phage from sewage and environmental samples that are capable of infecting 24 and 48 hour stationary phase PAO1 lawns. Challenged 24, 48, and 72 hour old PAO1 biofilms in a 96 well plate model with phage dilutions of 10^8 PFU/mL. After 6 hour incubation, biofilms were stained with crystal violet, de-stained within a week, and absorbance read at 590nm. Absorbances were compared to stock phage that are unable to infect stationary phase lawns.

RESULTS: Phage appear more effective on 72 hr biofilms and 48 hr biofilms compared to 24 hr biofilms, however there is evidence in literature that older biofilms, past 3 day old, are harder to kill. Stock phage that infect stationary phase are more effective on biofilms, but isolated stationary phase infecting phage are not necessarily more effective on reducing biofilm compared to stock phage that that do not infect stationary phase lawns.

CONCLUSIONS: Not all phage capable of infecting stationary phase P. aeruginosa lawns are effective on biofilms. Furthermore, phage efficacy on biofilms does not always decrease with increasing biofilm age using this 24-72 hour 96 well plate biofilm model.

Author List: Situ, Winnie; Maddiboina, Dhanyasri; Hosseini-Doust, Zeinab

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Abstract Title: Comparing the Effectiveness of Meditation & Video Games in Reducing Acute Stress in University Students

Abstract Description (maximum 250 words):
Undergraduate students are susceptible to high levels of stress. Mindfulness meditation has been reported in the literature to reduce the symptoms of stress. Although scarce, there is some evidence that playing casual video games may offer equivalent benefits. That said, previous studies have lacked an appropriate control group, which makes it difficult to discern the effectiveness of these interventions. In the present study, we therefore pseudo-randomized participants into one of three intervention groups: (1) participating in guided mindfulness meditation, (2) playing a casual video game, and (3) listening to a mind-wandering audiobook (active-control group). Before and after each intervention, we administered a self-reported linear stress scale, and measured participant blood pressure (systolic, diastolic), heart rate, and EEG alpha frontal asymmetry to measure the potential of each intervention to reduce psychological and physiological stress. Unfortunately, due to a limited sample size as a result of the COVID-19 pandemic, we cannot comment on the effectiveness of the aforementioned interventions.

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**Course Code:** HTHSCI 4A15 A/B, Thesis

**Abstract Title:**
The lateral extent of the sublaminar ridge with potential implications in degenerative lumbar spinal stenosis: a cadaveric study

**Abstract Description** (maximum 250 words):

BACKGROUND: The lateral extent of the sublaminar ridge and its relationship to the exiting nerve root are not detailed in the literature. In the setting of degenerative stenosis, this lateral part of the ridge can hypertrophy and impinge the exiting root in the lateral recess. Failure to address the sublaminar ridge during decompression may leave the exiting nerve root impinged and contribute to failed decompression.

PURPOSE: To provide detailed descriptions of the lateral extent of the sublaminar ridge, its neural relations, and its potential to impact on the exiting nerve root.

METHODS: Fifteen lumbar vertebrae not obviously degenerated were resected en bloc from fixed human cadavers and then transected through the pedicles, leaving the posterior column and neural elements intact and articulated. The shape of the sublaminar ridge in the lateral recess and its relationship to the exiting nerve root were carefully examined.

RESULTS: The exiting nerve root consistently crosses the ridge immediately inferior to the mid-pedicle. This close proximity between the sublaminar ridge and pedicle allows a hypertrophic ridge to impact the exiting nerve root in several ways, including elevating the nerve root superiorly against the bony underside of the pedicle or anteriorly against the vertebral disc/bodies.

CONCLUSION: We describe our observations of the lateral extent of the sublaminar ridge and investigate how it can impact the exiting nerve root. A full understanding of the ridge as a potential stenotic structure in the setting of degenerative lumbar stenosis may facilitate thorough lateral recess decompression.

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Course Code: HTHSCI 4C09

Abstract Title: Engagement of Young Adults with Developmental Disabilities in Community-based Activities Compared to Centre-based Activities

Abstract Description (maximum 250 words):
There has been a shift in supporting individuals with developmental disabilities from an institution to a community-based model. One of the issues raised by this shift is how to support individuals with developmental disabilities in community settings so that they actively participate in community activities. To promote active engagement, it may be important to understand the relationship between active engagement and the co-occurring environmental events such as the behaviour of support staff. The purpose of this study is to conduct an ecobehavioural analysis to observe the active engagement of adults with developmental disabilities in a centre compared to the community, and observe the co-occurrences with target events in the environment. Eight clients diagnosed with Autism Spectrum Disorder (ASD) were observed in Oakville and Toronto HUB. Conditional probabilities of the co-occurrence of active engagement and target events were calculated and compared to the base rate of active engagement. A partial interval recording method was used and the observe-record intervals followed an audio cueing system. It was evident that individuals had lower levels of problem behaviours when they participated in community programs. There was also increased active engagement when clients were in the community. Furthermore, statistical significance was reached with increased active engagement associated with walking. Additionally, active engagement associated with staff interacting with a group that included the target individual was depressed in the centre and heightened in the community. Future studies are needed to directly manipulate the environmental conditions in order to measure the impact on an individual's active engagement.

Author List: Stamp, Quinlan Hundert, Joel

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** HTHSCI 4A09

**Abstract Title:** Experiences of Second-Generation and 1.5 Generation Immigrants and the Cultural Barriers Faced in Professional Helping Relationships

**Abstract Description** (maximum 250 words):
Professionals who provide care in client-centered relationships must use effective communication skills in order to form a trusting relationship. Cultural differences, if not properly addressed, can potentially hinder the effectiveness of the professional helping relationship. Cultural competency is often overlooked among second-generation immigrants (SGI) or 1.5 generation (1.5G) immigrants (people born to immigrant parents, or immigrated themselves before their teen years, respectively). The uniqueness of this population to belong to two cultures while simultaneously feeling as they belong to neither can be referred to as biculturalism which can potentially create acculturative stress for SGI and 1.5G immigrants, particularly in their adolescent years. An understanding of how this unique population views cultural competency, and their specific needs in client-centered relationships, is essential for professionals providing care. A review of the literature was conducted through a variety of science and social science databases. This review framed the content of the following exploratory survey which was developed to gain insights on the experiences of these individuals and provide some understanding of cultural competence in a professional helping relationship. While this survey included a small sample size, it’s results can be used to provide insights on this population. It can be understood that SGI and 1.5G immigrants have their own unique identities, face their own distinct struggles in relation to their identity, and should be closely and independently considered when discussing cultural competence in professional client-centered relationships.

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Course Code: Unknown

Abstract Title: The Use of Music Therapy to Reduce Stress and Anxiety in Undergraduate Students: A Feasibility and Limited Efficacy Study

Abstract Description (maximum 250 words):
The undergraduate student population continues to deal with high levels of mental health concerns. However, the vast majority of undergraduate students with mental health issues do not reach out to external supports, citing a stigma surrounding mental health therapies and the absence of attractive interventions. Individuals struggling with anxiety and stress are especially prone to having those barriers prevent them from seeking help. Thus, there is a need for novel therapeutic candidates that reduce anxiety and stress in undergraduate students. Music therapy has the potential to address that need, but its ability to reduce anxiety and stress in undergraduates has not been investigated. In response, this project investigates the feasibility of offering community music therapy group sessions towards undergraduate students at a university where multiple supports already exist. Further, this study compares the efficacy of community music therapy group sessions versus the standard of care in reducing stress and anxiety in undergraduate students. Despite being truncated due to the SARS-CoV-2 pandemic, the data collected from this project was analyzed and reported. Ultimately, community music therapy appears to be a viable intervention in the undergraduate setting. Yet, community music therapy does not seem to reduce anxiety and stress in post-secondary students. However, the project was severely underpowered and lacked the data and protocol needed to make strong conclusions. As a result, further research is required to confirm the feasibility of community music therapy in an undergraduate setting and to determine its ability to reduce anxiety and stress in post-secondary students.

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Course Code: HTHSCI 4A15

Abstract Title: Evaluation of Leukopenia Following Febrile Non-Hemolytic Transfusion Reactions (FNHTR)

Abstract Description (maximum 250 words):
Background and objective: A patient was recently evaluated with Febrile Non-Hemolytic Transfusion Reaction (FNHTR) symptoms, alongside severe monocytopenia and a significant drop in neutrophils post transfusion. This led to the question whether this could be an unusual presentation of FNHTR, and if such reactions could be associated with leukopenia. The purpose of this retrospective observational case-crossover study was to determine the frequency and magnitude of leukopenia, neutropenia and monocytopenia in a general population of patients transfused with RBCs, plasma or platelets who developed FNHTR. Method: All Hamilton hospital patients with an FNHTR declared through Ontario Transfusion Transmitted Injuries Surveillance System (TTISS-ON) from 2013-2019 who had available lab data were included. Patients served as their own control. Leukopenia was defined as either a greater than 50% reduction in cell count post transfusion or a decrease in cell count below the lower limit of normal. Results: Of the 167 FNHTR cases with available data, 32 (22%) cases developed leukopenia, neutropenia and/or monocytopenia. Of the three conditions, the frequency of monocytopenia was the highest and was significantly associated with FNHTR post transfusion (OR: 2.90, 95% CI: 1.32-7.24, p<0.05) using the Firth logistic regression method. Frequencies of leukopenia and neutropenia were low, however the association between leukopenia and FNHTR post transfusion was still significant (OR: 4.80, 95% CI: 1.11-45.14, p<0.05) while that of neutropenia was not (OR: 3.20 95% CI: 0.91-16.51, p=0.07). More conclusive results could be obtained with a larger sample. Further research is also needed to understand the mechanism behind these associations.

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Abstract Title: Paraspinal Type 1 and Type 2 Muscle Fibre Distribution in Adolescent Idiopathic Scoliosis

Abstract Description (maximum 250 words):
Context: Adolescent idiopathic scoliosis (AIS) is the most prevalent type of scoliosis in youth. It can impact the normal growth of adolescents, but the cause and manifestation of the disease remains elusive. There has been suggestion that spinal curving is the result of paraspinal muscle pathology, but muscle fibre composition and changes in AIS is poorly understood. In particular, type I and II fibre distribution in paraspinal muscle in AIS has been inconsistently reported. Muscle fibre distribution is important to consider, with type I fibres performing slow, oxidative metabolism and type II fibres performing fast, anaerobic metabolism, providing insight into the changes in metabolic activity that take place in the paraspinal muscle of AIS patients.

Objective: To conduct a comprehensive review to evaluate the distribution of type I vs. type II muscle fibre in paraspinal muscle in AIS.

Data Sources: Several databases (MEDLINE, EMBASE, Web of Science, and CINAHL) were searched.

Study Selection: English-language articles reporting on type I vs. type II fibre localization in AIS.

Results: 11 articles met the inclusion criteria (n=209 patients). Ten studies reported the predominance of type I muscle fibres on the convex side of the scoliotic curve, and of type II fibres on the concave side of the curvature.

Conclusions: Type I and II muscle fibres are differentially localized to paraspinal muscle on the convex and concave sides of the spinal curve in AIS. This difference in muscle fibre phenotype can signal possible cause or secondary effect of AIS that needs further investigation.

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Course Code: HTHSCI 4G12 (Global Health Thesis)

Abstract Title: Exploring Transitional Healthcare for Formerly Incarcerated Individuals: A Narrative Review

Abstract Description (maximum 250 words):
Individuals who have been incarcerated experience worsen health conditions compared to the general population. Upon release, this population experiences high mortality rates due to lack of adequate access to primary care. A search of literature, using broad search terms, was performed in electronic research databases as well as relevant governmental and non-governmental organization sources regarding effective transition interventions and primary care engagement for this population post-release. It was found that enhancement of primary care with multi-disciplinary teams that include trained community health workers with a history of incarceration can address the unique transitional health and social needs of this population and improve their overall health while reducing acute care emergency department visits. Moreover, competing priorities often supersede efforts to seek medical care which are further compounded by the low socioeconomic factors, within this population, that are historically associated with limited access to healthcare. Access to healthcare and social assistance programs was found to be further compromised due to individuals lacking government issued health cards. Further research is needed to better understand the complex factors that underpin the poor ability of prison populations to obtain and retain government issued health cards and to further explore their association with health-seeking behaviour. Unlike some of the more complex socioeconomic barriers discussed, this barrier can be addressed through legal and policy reforms that address the logistical and financial challenges faced by incarcerated individuals in obtaining health cards, thus making it a promising point of intervention.

Word Count: 241

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Abstract Title: Examining the Effectiveness of Arts Workshops for Individuals with Developmental Disabilities

Abstract Description (250 words maximum):

BACKGROUND: Studies have shown that the arts can improve health and wellbeing, so they have been increasingly integrated into healthcare.1 Individuals with developmental disabilities may also benefit from the arts, as artistic expression may help them communicate more easily.2 The objective of this research is to implement arts workshops for adults with developmental disabilities and examine the effectiveness of arts workshops.

METHODOLOGY: Researchers looked at existing research in the use of art for individuals with developmental disabilities. They partnered with Adults in Motion East Hamilton (AIM), an organization for individuals with developmental disabilities, to conduct free, weekly drop-in arts workshops. Workshops were designed using personal experiences and existing research that provided guidelines to help facilitate arts workshops. Upon completion of seven workshops, semi-structured interviews were conducted with the Program Coordinators and participants. Participants were interviewed if they attended 6+ workshops.

RESULTS: Transcriptions of interviews indicated that the participants enjoyed the workshops - particularly in drama and music. The Program Coordinators observed increased communication between the participants both during and outside of workshops and noted how the participants often spoke of the workshops after their completion. Although it was challenging to engage all the participants weekly, each participant explained that they still liked attending the workshops. A limitation is the small sample size, as only three participants regularly attended the workshops.

CONCLUSIONS: Despite limitations with the implementation of the arts workshop, the participants enjoyed the workshops and regularly attended them. The arts may help improve communication between individuals with developmental disabilities, but more research should be conducted to further examine whether a correlation exists.

Author List: Tse, Tiffany¹ & Jafine, Hartley¹

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References:
**Course Code:** HTHSCI 4A09 Thesis Project

**Abstract Title:** The Effects of Aerobic Pre-Training on Mitochondrial-Related Protein Content Following Resistance Training

**Abstract Description** (maximum 250 words):
Mitochondria are essential organelles responsible for generating cellular energy and have been found to adapt to changes in oxidative demands such as with aerobic exercise. More recently, it has been proposed that the cellular energy generated by mitochondria may help to support adaptive responses to resistance training. Thus, the purpose of this study was to determine the role of aerobic pre-training on mitochondrial adaptations to resistance exercise.

Fourteen healthy, recreationally active, young (ages 21 ± 0.43) men (n=8) and women (n=6) underwent 6 weeks of unilateral aerobic training followed by 10 weeks of bilateral, lower body resistance training. A muscle biopsy was taken from the vastus lateralis at baseline (Pre), and bilateral biopsies were taken following aerobic training (Mid) and resistance training (Post) to measure the impact of aerobic pre-training on mitochondrial-related protein content. Using immunohistochemical staining, COXIV protein content was measured in both T1 and T2 muscle fibres at Pre (2156 ± 261 T1, 1896 ± 215 T2), trained Mid (2587 ± 402 T1, 2252 ± 337 T2), trained Post (2229 ± 356 T1, 1868 ± 250 T2), and untrained Post (1895 ± 205 T1, 1646 ± 166 T2) with no significant changes being detected between any of the time points in the study. T1 fibres were found to have greater total COXIV protein content compared to T2 fibres (2217 ± 156 and 1916 ± 125 respectively) regardless of training. These results indicate that aerobic pre-training does not impact mitochondrial protein content following resistance training, but further research is warranted to improve the statistical power of the data.

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**Course Code:** HTHSCI 4A09

**Abstract Title:** Impact of Maternal Insulin Levels on Likelihood of NICU Admission: A Retrospective Review

**Abstract Description** (maximum 250 words):
In the first day after birth, newborns are at risk of developing hypoglycemia. Glucose levels drop in the initial hours after birth, but they usually normalize. However, there are risk factors that predispose babies to prolonged hypoglycemia, such as maternal diabetes (Gestational, Type 1, or Type 2 Diabetes). High maternal blood glucose could trigger neonatal islet cells to overproduce insulin. This could continue after the umbilical cord is cut, causing lower serum glucose levels until neonatal insulin production is regulated and decreases. For diabetic pregnant women who are taking insulin, it is unknown if the daily insulin quantity taken is an indirect marker of the probability of babies having symptomatic hypoglycemia requiring intravenous glucose infusion. This research is essential to predict the likelihood of admission to the Neonatal Intensive Care Unit (NICU) and allow for more aggressive interventions to prevent neonatal hypoglycemia. This retrospective analysis will determine if maternal insulin above 100 units daily increases the likelihood NICU admission for babies with hypoglycemia. The primary objective of the study is to assess the NICU admission rate of infants born to mothers who need 100 units of insulin daily or higher compared to the rate for babies born to mothers who need less than 100 units. Patient data will be collected and analyzed from the William Osler Health System (WOHS) health records. The WOHS has over 8000 deliveries each year with approximately 20% maternal diabetes patients. There will be a large sample from which meaningful conclusions can be drawn.

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Course Code: HTHSCI 4B06

Abstract Title: Attitudes Towards Chiropractic: A Survey of Canadian Family Physicians

Abstract Description (maximum 250 words):

Background: Family physicians and chiropractors often attend to similar patient populations, but little is known about the attitudes of family physicians towards chiropractic.

Methods: We administered a 50-item cross-sectional survey to 1926 Canadian family physicians that inquired about demographic variables and their knowledge and use of chiropractic. Imbedded in our survey was a 20-item chiropractic attitude questionnaire (CAQ).

Results: Out of the 2996 physicians contacted by telephone, only 1926 answered and confirmed their fax number. Questionnaires were faxed to these 1926 physicians but only 162 questionnaires were completed and returned. This resulted in a response rate of 8.3%.

Discussion: Our survey of Canadian family physicians found that attitudes toward chiropractic are diverse with a bias towards positive. Their impression of chiropractic was recorded as 49.4% being positive, 26.5% being neutral, and 24.1% being negative. The majority of responses indicated that family physicians found that chiropractors were able to provide effective therapy for some musculoskeletal conditions. Additionally, physicians thought that chiropractors could be beneficial in reducing patient overload with respect to musculoskeletal complaints. However, an overwhelming number of physicians also indicated that chiropractors are unable to treat non-musculoskeletal conditions such as asthma and colic.

Conclusion: This questionnaire demonstrates that there is an opportunity to improve interprofessional collaboration between family physicians and chiropractors.

Author List: Vinh, Brian. Pallapothu, Sushmitha. Busse, Jason

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Abstract Title: Facilitators and Barriers to Healthy Midlife Transition among Immigrant Women: A Literature Review

Abstract Description (maximum 250 words):
Over the past decade there has been a great influx in number of immigrants globally. One group which has been of great interest whilst looking at immigration is midlife women, as the midlife transition is viewed as a critical period. Limited attention has been paid to immigrant women’s midlife experiences. There are multiple transitions during this time such as the biopsychosocio-cultural transition of menopause, the cultural transition from immigration, the socioeconomic transition from potentially shifting careers which a middle-aged immigrant woman may face.

Multiple electronic databases (EBSCOhost, OVID, Proquest, Education Research Complete) were selected to search for articles related to facilitators and barriers relating to midlife transition among immigrant women.

After searching and excluding articles, 47 articles were included in this review. Findings were grouped at the personal, familial, and societal levels. Personal facilitators included income/employment, autonomy, exercise, and learning new skills, while barriers included physical ailments, lack of exercise, language barrier, low educational status, non-acceptance of foreign degrees, and negative midlife perception. Familial facilitators included relationship status and partner support, non-partner family members’ support, and being a grandmother, while barriers included divorce/widowhood, competing career and family responsibilities, lack of health-related support, and empty-nest syndrome. Societal facilitators included community and healthcare services, acculturation, and financial and religious support, while barriers included insufficient healthcare service, occupational issues, discrimination, sexism, cultural expectations, and lack of social support resources and social networks.

Understanding the intersection of such determinants allows professionals to create interventions which enhance facilitators and target barriers for immigrant women.

Author List:
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b) Dr. Ping Zou

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A15

Abstract Title: Variability in the Allergen Challenge Affecting the Late Asthmatic Response

Abstract Description (maximum 250 words):
Asthma is a severe chronic respiratory disease characterized by bronchoconstriction, mucus hypersecretion, airway remodeling, and eosinophilic inflammation. The prevalence of asthma has caused it to become one of the most common pathologies globally, with over 300 million individuals suffering from the disease at this moment. The allergen challenge is an effective, longstanding method of producing both the early asthmatic response (EAR) and late asthmatic response (LAR) in asthmatics allowing for the study of asthma pathophysiology and novel anti-asthma treatments. The LAR is perhaps the more significant of the two asthmatic responses due to its severe and prolonged reaction, lasting between 3 to 7 hours post-allergen administration. Many studies have proven the allergen challenge to be a reliable procedure through the exploration of potential variabilities and confounders in the test. However, despite the importance of the allergen in the allergen challenge, no studies have explored whether the allergen itself serves as a confounding factor in the clinical test. The present study aims to understand if different allergen extracts may serve as independent variables within allergen challenges. It is hypothesized that certain allergens used within the allergen challenge independently worsen the LAR, rendering the results of previous allergen challenges to be questioned. The implications of a positive finding would indicate a need for adjustments in the allergen challenge, potentially altering the procedure of this gold standard method in the field of asthma.

Author List: Curtis Weng, Justina Greene, Mylinh Duong, Gail Gauvreau

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Abstract Title: Self-management in youth with epilepsy: How can they adopt a healthy and active lifestyle?

Introduction: There is a need for individually-developed interventions that address child- and youth-identified challenges in self-managing their life with epilepsy. We aim to identify the experience, facilitators and barriers to increasing and/or maintaining physical activity (PA).

Methods: We recruited youth with epilepsy (YWE) who participated in our previous RCT, and their caregivers. The RCT investigated the effectiveness of a personalized coaching intervention in increasing physical activity. Participants were invited to join one-hour virtual (via Zoom) focus group sessions, separate for girls, boys, mothers, and fathers. These sessions were facilitated by child life specialists, and thematically analyzed.

Results: We have conducted 4 successful focus group sessions: one for older females, two for mothers, and one for fathers. The major themes that emerged from the thematic analysis include the following factors: developmental, personal, environmental, the impacts of epilepsy on PA, and the role of technology and PA, familial role, and motivators for PA.

Discussion: This qualitative study provided valuable insight into the impacts of epilepsy on PA, both from a child and caregiver perspective. Epilepsy affects many areas of a youth’s life, including family dynamics, social interactions, and individual development, which together play an important part in participation in PA. By understanding these lived experiences, healthcare providers and researchers can better support YWE and their caregivers and create tailored interventions to help them maintain a healthy lifestyle.

Conclusion: Going ‘to the source’ identified strategies either used, or proposed, to help YWE adopt and sustain a healthy lifestyle.

Authors List:
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Course Code: Unknown

Abstract Title: Investigating the Effects of an Intergenerational Classroom on Student Social Skills and Older Adult Engagement Levels

Abstract Description (maximum 250 words):
An intergenerational (IG) classroom is a program embedded in a long-term care (LTC) home that promotes life-long learning by engaging students and older adults in educational activities based on the students’ school curriculum. Prior research has shown that IG programs yield benefits for both populations, but little research has been conducted on IG classrooms. This study aims to measure the effects of an IG classroom on the social skills of students and the engagement levels of older adults by using the Strengths and Difficulties Questionnaire and the Menorah Park Engagement Scale, respectively. In addition, qualitative interviews will be conducted with select students, residents, the teacher, and LTC staff members to determine whether participants feel observable differences as a result of the IG classroom. This study will allow us to identify barriers to participation such as cognitive disability and pre-existing distress. By understanding these barriers, we will be able to modify the IG classroom in a way that will enhance the overall experience of all participants, potentially broadening the effects of the IG classroom. The findings of this study will help to establish a foundation for the structure of IG classrooms while also guiding any future research studies.

Author List: Willick, Kaitlyn; Abbat, Bipandeep; Bhons, Prabhnoor; Mackinnon, Chelsea

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A15

Abstract Title: The Allergy & Clinical Immunology Choosing Wisely Recommendations: “Seven Things Clinicians and Patients Should Question”

Abstract Description (maximum 250 words):

Introduction
Choosing Wisely Canada is a health education campaign that aims to reduce unnecessary, low-value, or harmful tests, treatments and procedures in the Canadian healthcare system. This allergy-specific guideline offers those with a special interest in the treatment of allergic and immunologic diseases a series of recommendations for clinical practice, with an emphasis on limiting overuse of resources and improving patient care.

Methods
In June of 2018, a Canadian Society of Allergy & Clinical Immunology (CSACI) Task Force was created to lead work on these guidelines. The Task Force selected the top 7 recommendations for avoiding unnecessary practices through a multifaceted consensus process. In determining items for inclusion, the following domains were considered: appropriateness, evidence of low value or harm, frequency of use, relevance to the core of the specialty, potential overuse of resources, and opportunities to improve patient care.

Results & Conclusion
The development of the Choosing Wisely Canada allergy-specific list of 7 recommendations for clinical practice was a collaborative and consensus-based process made possible by a partnership between the CSACI Task Force, CSACI members, the Canadian Thoracic Society and the Choosing Wisely Executive Committee. By identifying appropriate and important allergy-related items that were relevant to the core of the specialty and to the Canadian population, a final list was generated. This final list has been endorsed by all partners involved and will be released and disseminated shortly on the Choosing Wisely Canada and CSACI online forums.

Word Count: 233 words

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Course Code: HTHSCI 3D03

Abstract Title: A study protocol for a systematic literature review: a comparative analysis of biomarkers as diagnostic tools for psychological stress in music-based and music therapy interventions

Abstract Description (maximum 250 words):

Introduction
Psychological stress is a significant public health concern as it is associated with various comorbidities and long-term health implications. Music-related interventions have become increasingly popular therapies of choice in alleviating psychological stress and improving one’s physical and mental wellbeing. This protocol outlines our process for conducting a systematic review to identify all neuroendocrine biomarkers used to evaluate psychological stress in music and music therapy-based interventions.

Methods and Analysis
A systematic literature review will be conducted in accordance with the PRISMA guidelines for reporting. Searches will be performed within the PubMed, MEDLINE and Web of Science databases to identify all randomized control trials assessing psychological stress in participants engaging in music and music therapy-based interventions. Criteria for search methods and article eligibility were determined a priori. Articles that meet all eligibility criteria after full-text screening will undergo risk of bias assessment using the ROBINS-I tool and quality assessment following the GRADE guidelines.

Discussion and Registration
This protocol has been submitted for registration in the PROSPERO database. The results are intended to improve our understanding of the use of biomarkers as diagnostic tools for psychological stress in music-related interventions, such as music therapy, as well as determine the most appropriate biomarker for analyzing the stress-response.

Word Count: 198 words (maximum 250 words)

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Abstract Title: Turmeric and lipid risk factors for cardiovascular disease: a systematic review and meta-analysis

Abstract Description (maximum 250 words):

Background: Turmeric (also known as Curcuma longa) is a plant root with a rich, yellow colour, and is a spice found within traditional Indian curry dishes. Numerous animal studies have shown how curcumin lowers both cholesterol and triglycerides, however, human studies are less conclusive. Objectives: The aim of this systematic review is to summarize the effects of turmeric on serum lipid profile cardiovascular risk factors in humans.

Methods: To identify publications evaluating the effect of turmeric on cardiovascular risk factors in humans, the databases MEDLINE, EMBASE, AMED, Web of Science and CINAHL were searched through March 2019. Randomized controlled trials and crossover trials reporting on the cardiovascular outcomes associated with the serum lipid profile, done in humans, were included. We abstracted design features, participant characteristics, interventions, and outcomes, and assessed study risk of bias. We then pooled results on the reported outcomes using random effects models with inverse variance weighting.

Results: Turmeric showed trends of lowering total cholesterol levels, low-density lipoprotein cholesterol levels, and total triglyceride levels, while raising high-density lipoprotein cholesterol levels. However, no results were statistically significant. Our statistical analysis was limited by heterogeneity amongst studies.

Conclusions: The effects of turmeric in reducing serum lipid profile cardiovascular risk factors are unclear, thus more research is warranted to determine if a relationship exists.

Author List: Wyslobicky, Melody J., de Souza, Russell J.

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Abstract Title: Learning Needs of Family Physicians and Trainees on Eating Disorders

Abstract Description (maximum 250 words):

Rationale:
Eating disorders (EDs) are serious psychiatric conditions characterized by significant disturbances in behaviours and attitudes that surround eating, body weight, and body shape. Of all psychiatric disorders, EDs have the highest mortality rate. Although early intervention is crucial, many patients do not receive the specialized care they need. The onus then falls on family physicians who are not sufficiently trained, to detect and manage patients suffering from an ED.

Objectives:
First, to explore the learning needs of family physicians and residents in providing care for patients with an ED. Second, to investigate how online learning can be used to address said learning needs.

Methods:
Two separate focus groups and two individual interviews were conducted. Participants were recruited from the Greater Toronto and Hamilton Area, consisting of 5 academic family physicians, 2 community family physicians, and 6 family medicine residents. Semi-structured interview questions were used. Sessions were audio-recorded, transcribed verbatim, then coded using NVivo.

Results:
There is insufficient medical education and training on EDs for family physicians. Participants predominantly struggled with discussing EDs, screening of EDs and managing ED patients. Regarding eLearning preferences, participants highly valued forums, case-based modules, and links to external resources. A significant emotional burden was associated with feeling unprepared when caring for ED patients.

Conclusion:
Due to the lack of education and training in EDs, family physicians and residents struggle to engage, identify, and manage ED patients. The high mortality associated with EDs necessitates the provision of educational resources that are easily accessible, evidence-based, and patient-centred.

Authors List:
Xavier, Sabatinie
Tse, Angel
Trollope-Kumar, Karen
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Lokker, Cynthia

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** HTHSCI 4A15

**Abstract Title:** Do Fine-Needle Aspiration Biopsies Delay Treatment of Lymphoma?

**Abstract Description** (maximum 250 words):

**Background**
Approaches to lymphoma diagnosis include fine-needle aspiration (FNA), image-guided core node biopsy, and excisional node biopsy (the gold standard). However, FNA may have loss of nodal and cellular architecture and limited sample quantity, deferring diagnosis. Delayed diagnosis is correlated with progressive disease, lower survival rate, and psychological distress. We sought to determine if FNA delays the treatment of lymphoma in a regional cancer program.

**Methods**
A retrospective review was performed at Juravinski Cancer Centre in Hamilton, Canada. Patients referred with a new or suspected lymphoma diagnosis between July 2016 to May 2019 were included. Demographics, times to biopsy results, diagnoses, and treatments were recorded. Mean differences between first biopsy and defined endpoints were compared. Statistical analysis was completed with Microsoft Excel. The Hamilton Integrated Research Ethics Board provided ethics approval.

**Results**
One hundred and eighty patients diagnosed with lymphoma through lymph node biopsies were included. Eighty-three patients (46.1%) were female and the mean age was 60.4 ± 18.0 years (18 to 92 years). There were significant increases in average wait times from first biopsy to diagnosis between FNA in comparison to core and excisional biopsy (p=0.0021 and p=0.0005, respectively). There was also a significant difference in the average time from first biopsy to treatment between core biopsy and FNA (p=0.0042).

**Conclusion**
The use of FNAs to diagnose lymphoma resulted in increased wait times from first biopsy to final diagnosis compared to excisional or core needle biopsies. Quality improvement initiatives can be used to address the timely diagnosis of lymphoma.

**Word Count:** 249

**Author List:**
Xu, Laura
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**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** HTHSCI 3H06

**Abstract Title:** Fecal Serotonin as a Biomarker of Inflammatory Bowel Disease

**Abstract Description** (Word Count = 248):

**BACKGROUND:** Inflammatory bowel disease (IBD) is a group of diseases that causes ulceration and inflammation in the gastrointestinal tract, with ulcerative colitis (UC) and Crohn’s Disease (CD) being the two major types. Serotonin (5-HT) plays an important role in the intestine, and has previously been shown to be increased in patients with IBD. Consequently, fecal 5-HT (F5HT) may be a promising and exceedingly accessible biomarker of IBD, compared to endoscopy, an invasive and costly gold standard. This pilot study explored the alterations of F5HT in patients with CD and UC compared to healthy controls (HC).

**METHOD:** Fecal and colonic 5-HT was measured in mice treated with either water (n=5) or 5% dextran sodium sulphate (n=5), which induces colitis. F5HT was measured in HC (n=7), individuals with UC (n=11), and CD (n=8). The clinical and endoscopic disease activity scores of individuals with IBD were also recorded. ELISA was used to analyze 5-HT in all cases.

**RESULTS:** F5HT in mice with colitis was significantly increased compared to control mice (p>0.0001, 95%CI=5.275-8.869). When compared to HC, F5HT was higher in CD (p=0.3934) and lower in UC (p=0.3537), but did not reach statistical significance. C-reactive protein and F5HT showed a moderate positive correlation (r²=0.3438).

**CONCLUSION:** The difference in F5HT between individuals with IBD and HC was not statistically significant; however, the differences should be further explored in larger samples using liquid chromatography with mass spectrometry.

**Author List:** Zuhayr Yakub, Sabah Haq PhD¹ (candidate), Waliul I. Khan³ MBBS, PhD, FRCPath (UK)

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Course Code: HTHSCI 4D03

Abstract Title: Phantom breast syndrome in individuals who have undergone mastectomies: a scoping review of the literature

Abstract Description (Word Count = 250):

BACKGROUND: As increasingly successful treatment of breast cancer through mastectomy is achieved, post mastectomy pain syndromes (PMPS) has become more common. Phantom breast syndrome is a type of PMPS in which mastectomy survivors feel as though the breast is present, even after removal.

OBJECTIVE: To gain a holistic understanding of how phantom breast syndrome has been described in the literature

METHOD: A scoping review methodology was utilized. Search terms relevant to the field of inquiry were used to compile 57 articles written between 1872 and 2017.

RESULTS: The majority of included articles were epidemiological and phenomenological studies, with very few utilizing experimental designs. Phantom breast phenomena were thought to be caused by cortical remapping, with psychological factors likely modulating the intensity of these sensory experiences. Phantom breast sensations (PBS) were described as a feeling of the removed breast being present, in addition to tingling, itching, numbness, and throbbing in the removed breast. In contrast, phantom breast pain (PBP) was categorized as sharp, cramping and/or burning. Among the included articles, the median prevalence of PBS was 32.75% (range: 9.5-66%), while median PBP was 9% (range: 3-43%). Numerous studies found younger age, higher depression scores, more presurgical pain, and being premenopausal as risk factors for experiencing phantom breast phenomena. In the past, patients have reported management of symptoms with analgesics, antidepressants, and anticonvulsants.

DISCUSSION: Phantom breast phenomena is a persistent complication of mastectomy. Future research should employ experimental models to uncover the efficacy of potential protective and therapeutic interventions.

Author List: Zuhayr Yakub, Tara Packham¹ PhD, OT Reg. (Ont.)

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**Course Code:** Unknown

**Abstract Title:** Optimizing Model Size to Enhance Student Learning

**Abstract Description** (maximum 250 words): 

**Introduction:** Historically, learning anatomy was limited to studying “life-sized” cadaveric materials. Today, 3D scanning and printing technology allow for the production of inexpensive and durable anatomical replicas at virtually any size. However, there is currently no literature identifying the size at which models should be printed to optimize learning. We hypothesize that a curvilinear relationship between model size and learning exists, where a model too small would negatively impact learning, and an ideal intermediate size can be determined.

**Methods:** Undergraduate students (n=379) without prior anatomical training learned from four bones models, each 3D-printed at four different scalar sizes (thoracic vertebra, hemipelvis, sphenoid, and scapula). Each participant was randomized to a group of two models to learn from (either vertebra/hemipelvis or scapula/sphenoid). After learning, participants were then tested on the respective real bone specimens. Each participant also completed a Mental Rotations Test and an Operation Span Test.

**Results:** Test scores ranged from 63% to 91%, where the lowest scores are associated with the smallest models. Once model diameter exceeded 10cm, all scores exceeded 75%. Further, using hierarchical multiple linear regression, there was a significant effect of model size on test score, F(2,707)=17.15, p <0.05, r²=0.046.

**Conclusion:** While significant, the negligible effect size of this regression model suggests that people, in general, are good at dealing with large variations in model size. These results suggest that there may be no additional benefit of upsizing models beyond 10cm in diameter.

**Author List:** Yang, Jack; DeYoung, Veronica; Xue, Yuan; Nehru, Amit; Brewer-Deluce, Danielle; Wainman, Bruce

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A09

Abstract Title: Developing a Humanize Mouse Model for HIV Infection

Abstract Description (maximum 250 words):
Approximately 38 million people are living with HIV in the world, where many develop co-morbidities in addition to increased risks of opportunistic infections. The tremendous disease burden and prevalence of HIV prompts further research for better understanding of various aspects of HIV including virus transmission, pathogenesis, prevention, and cure. Humanized mouse (hu-Mouse) models are more ethical, cost effective, and allows for HIV specific investigation compared to the widely used non-human primate models considering the human tropic nature of HIV. NOD-Rag Gamma (NRG) mice are immunodeficient due to their targeted mutations at the recombination-activating gene (RAG) 1 and 2 loci, and common γ-chain receptor locus. These features significantly reduce innate immune cell function and completely eliminate, NK, T, and B cell function. Unfortunately, reconstitution of human cells after engraftment in NRG mice are very low compared to models with additional human features. Mice expressing both human leukocyte antigen (HLA) class I and II (HLA-A2, and HLA-DR4 respectively) termed DRAGA2 mice, have demonstrated significantly higher human immune cell reconstitution. In the literature, comparisons have not yet been made between engraftment in DRAGA2 newborn and adult mice, therefore this promising model is yet to be optimized. In the Gillgrass lab, DRAGA2 colonies have been established through genotyping and cross breeding. Human CD45+ leukocyte reconstitution (above 1%) was demonstrated in 40% of NRG mice after engraftment of human CD34+ hematopoietic stem cells. These results from the NRG model have confirmed the engraftment and analysis methods for future development of an optimized DRAGA2 hu-mouse model.

Author List: Yang, Jack; Lepard, Madeleine; Gillgrass, Amy

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: HTHSCI 4A15

Abstract Title: Antibody Detection of Human and Bat IRF9

Abstract Description (maximum 250 words):
Due to recent outbreaks of zoonotic diseases such as coronavirus disease 2019 (COVID-19), severe acute respiratory syndrome (SARS), and Middle East respiratory syndrome (MERS), bats have become a prominent subject of research for their unique relationship with viruses. Bats have been infected with numerous viruses that cause severe disease in other mammals, including Ebola virus, Marburg virus, and Nipah virus, but do not present clinical signs of disease. Numerous studies have demonstrated that bats have adaptations in their immune responses, including dampened inflammatory responses and more robust antiviral responses, that might contribute to their ability to co-exist with viruses. Interferon regulatory factors (IRFs) 3, 7, and 9 have been shown to have undergone positive selection in mammals. Evidence suggests that positively selected sites in bat IRFs 3 and 7 contribute to their enhanced antiviral function. In order to study IRF9 and determine whether the positively selected mutations in bats convey enhanced antiviral responses, we sought to identify a method of accurately detecting human and bat IRF9 that could be used in future experiments. We found that anti-IRF9 antibodies Abcam #AB51639 and Invitrogen #PA5-40357 do not bind to human or bat IRF9. Invitrogen #702322 accurately detects human IRF9 but fails to bind to E. fuscus and P. alecto IRF9. Unable to find a suitable commercial antibody, we cloned human and bat IRF9 sequences into p3x-FLAG-CMV-7.1 expression plasmids. The FLAG-tagged IRF9 clones were functional in cell culture and IRF9 expression could be detected using anti-FLAG antibody.

Author List: Alyssa Yip, Arinjay Banerjee, and Karen Mossman

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Course Code: Unknown

Abstract Title: Unknown

Abstract Description (maximum 250 words):

Background
Oscillating rotating and side to side toothbrushes are amongst the most available toothbrushes. A systematic review that compared different powered toothbrushes, including oscillating rotating and side to side, for plaque control and gingival health was conducted in 2011. The clinical importance between the two modes of actions in reducing plaque and gingival indices is unclear due to the lack of quality trials. Furthermore, many new studies on oscillating rotating and side to side toothbrushes have emerged since then.

Methods
This systematic review included studies that compared oscillating rotating vs side to side mode of action toothbrushes, while measuring plaque and gingival index reduction in patients without any motor disabilities. The two authors independently screened studies performed data abstractions and assessed risk of bias. The authors used random effects model meta-analysis and the Grading of Recommendations Assessment, Development and Evaluation approach to rate the certainty of evidence.

Results
This meta-analysis included a total of 2908 participants from 23 trials. At 4 weeks from baseline, the side to side toothbrushes may result in little to no difference in plaque index reduction when compared to oscillating rotating toothbrushes (Oscillating rotating (OR) vs side to side toothbrushes for plaque index reduction at 4 weeks from baseline. Standardized mean difference [SMD], 0.02 on a 2-point scale; 95% confidence interval [CI], -0.46 to 0.42).

Conclusions
Evidence does not suggest the superiority of either oscillating rotating or side to side toothbrushes in clinical practice for plaque or gingival index reductions.

Author List: Ali Younis, Hussein El-chami, & Romina Brignardello.

Affiliations (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** HTHSCI 4C15

**Abstract Title:** Associations between parental factors and changes in children’s preoperative anxiety from pre-operative assessment to same-day surgery

**Abstract Description** (maximum 250 words):

**Background:** Children typically spend a significant amount of time with their parents, who are part of their microsystem, according to the Ecological Systems Theory (Bronfenbrenner, 1979). While anxiety may be transmitted across generations from parent to child, parenting styles and rearing behaviours may contribute more to a child’s anxiety (Eley et al., 2015).

**Purpose:** This study investigates how parental factors affect the changes in preoperative anxiety of children undergoing elective surgery, using measurements at a pre-operative assessment as baseline.

**Methods:** Data were part of the Pediatric Anxiety Study, which was a pilot study using a randomized controlled trial to assess the effects of a tablet-based intervention on reducing children’s preoperative anxiety. The sample consisted of 101 children aged 8-13 years who were recruited from McMaster Children’s Hospital. Child measurements included: changes in anxiety using the self-report Children’s Perioperative Multidimensional Anxiety Scale (CPMAS) and stress using salivary cortisol. Parental factors included: anxiety using the self-report State-Trait Anxiety Inventory (STAI), parenting behaviours using the child-report Parental Bonding Instrument (PBI), and stress in the parent-child system using the self-report Parenting Stress Index—short form (PSI).

**Results:** Preliminary findings from this study showed that preoperative anxiety and stress reactivity is influenced by several factors relating to the parent.

**Conclusion:** These results suggest that it may be important to use a biopsychosocial model approach when researching child anxiety. The study findings may provide a direction for future research, for example targeting certain parental components in the design of interventions for reducing preoperative anxiety.

**Author List:** Yu, Christy; Chow, Cheryl H.T.; Van Lieshout, Ryan; Buckley, Norman; Schmidt, Louis A.

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown

**References:**
**Course Code:** HTHSCI 4A15

**Abstract Title:** The impact of a bisphosphonate drug holiday on bone mineral density (BMD) and bone fractures in patients with osteoporosis: A retrospective chart review.

**Abstract Description** (maximum 250 words):

**Background**
Bisphosphonates are commonly used in the treatment of osteoporosis to prevent bone fractures. It has been suggested that if the bone mass density (BMD) of a patient with osteoporosis improves and fracture risk decreases, they can be placed on a drug holiday to reduce drug side effects and improve drug allocation. This study explores the impact of a bisphosphonate drug holiday on L2-L4 and femur BMD T-scores and incidence of bone fractures in osteoporotic patients.

**Methods**
Charts from patients with osteoporosis on a drug holiday were reviewed retrospectively from a tertiary clinic. BMD T-scores of the L2-L4 region and femur as well as the incidence of bone fractures were extracted across the duration of the drug holiday.

**Results**
205 patient charts were reviewed. Women experienced a greater decrease in BMD T-scores and increase in fractures compared to men. Patients aged >75 saw an improvement in BMD T-scores but also experienced a higher frequency of bone fractures during their drug holiday. Patients who were on a bisphosphonate treatment for a shorter period of time saw greater improvements in BMD T-scores and reduced risk of fractures during their drug holiday compared to those who were on a treatment for a longer duration of time.

**Conclusion**
The duration of a bisphosphonate drug holiday should be individualized to each patient according to their BMD T-scores and fracture risk. Sex, age, and the duration of a previous drug treatment impact the disease outcome of a bisphosphonate drug holiday.

**Author List:** Yu, Yiyao J.; Adachi, Jonathan D.

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
**Course Code:** HTHSCI 4A09

**Abstract Title:** Quantum Supremacy: Fact? Fiction? Perhaps a superposition of both.

**Abstract Description** (maximum 250 words):
A quantum computer is a theoretical device which uses the properties of quantum mechanics such as superposition and entanglement to perform computations. It has been shown, as with Peter Shor’s famous factoring algorithm, that these theoretical machines would be able to perform computations which may not be computable classically. The recent publication in Nature entitled “Quantum supremacy using a programmable superconducting processor” makes bold claims on the current state of quantum computing. This review aims to provide the conceptual background to understand these bold claims of ‘quantum supremacy’, its challenges and the current hurdles in the way of reaching universal quantum computers.

**Author List:** Zegarmistrz, Marcin; Speissegger, Patrick

**Affiliations** (at least for the primary supervisor, as well as any other collaborators who have other affiliations): Unknown
Abstract Description (maximum 250 words):

Background: Obesity affects over 650 million persons globally and up to 75% of BMI variation is explained by genetic factors. Genome-wide association studies and subsequent fine-mapping in Europeans highlight the association of 5 common, non-synonymous SNPs in the NPC1 locus (rs1805081, rs80358251, rs1788799, rs1805082, and rs1805084) with BMI and morbid adult obesity. To date, the association of these 5 variants with obesity in East Asian populations has not been assessed. This study investigates the association of NPC1 SNPs with BMI in 158,284 individuals from the BioBank Japan Project.

Methods: DNA was collected at baseline from patients enrolled at 12 medical institutes all over Japan, and BMI data was obtained from medical records. SNPs that were monomorphic in the East Asian population of the 1000 Genomes project were excluded. Association summary statistics were extracted for polymorphic SNPs.

Results: Four SNPs (s1805081, rs1788799, rs1805082, and rs1805084) were polymorphic in the Japanese population from 1000 Genomes with a minor allele frequency ranging from 5 to 26%. These SNPs display modest linkage disequilibrium in the Japanese population ($D' = 1$, $r^2$ between 0.015 and 0.144), but show stronger linkage disequilibrium in the European population ($D'$ between 0.91 and 1, $r^2$ between 0.015 and 0.729). Rs1788799 was the only polymorphic SNP to display an association with BMI in the Biobank Japan population.

Discussion: Consistent with studies, rs1788799 is a likely causal variant for the GWAS signal between NPC1 polymorphisms and BMI/obesity. This study also demonstrates the importance of multiethnic investigations and trans-ethnic transferability studies.

Author List: Zhang Jessie, Meyre David

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Course Code: HTHSCI 4C15

Abstract Title: Equal Association of the Triponderal Mass Index & Body Mass Index Z-scores with DEXA Measures of Adiposity in Pediatric Acute Lymphoblastic Leukemia Patients

Abstract Description (maximum 250 words):
Survivors of pediatric acute lymphoblastic leukemia (ALL) are at a significant risk of chronic health conditions including obesity, metabolic syndrome, and type 2 diabetes due to excess adiposity. Dual-Energy X-ray Absorptiometry (DEXA) scans are the gold standard for measuring adiposity but are not easily available. Tri-Ponderal Mass Index (TMI) (kg/m3), has been validated as a more accurate adiposity measure compared to Body Mass Index (BMI) z-score, in the general pediatric population. However, there are no data to determine if TMI is associated with adiposity in ALL survivors.

The objective of this cross-sectional study was to assess the validity of TMI as a measure of adiposity in survivors of pediatric ALL after completion of chemotherapy.

This was a retrospective chart review of survivors of pediatric ALL diagnosed in 2004-2017 at McMaster Children’s Hospital. One hundred and fifteen patients (n=54 female, n=61 male) had DEXA data available. Linear regression analyses were adjusted for age, sex, ethnicity and ALL risk status.

Both TMI and BMI z-scores had a medium correlation with the DEXA-measured fat mass (TMI and FM% ρ=0.567; p<0.01; BMI z-score and FM% ρ=0.560; p<0.01; TMI and FM% β=0.536; p<0.01; BMI z-score and FM% β=0.546; p<0.01; Adjusted R2 values: TMI and fat-mass=0.340; BMI z-score and fat-mass=0.342). Further research is needed to establish valid clinical measures of adiposity in childhood cancer survivors.

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Course Code: HTHSCI 4A12

Abstract Title: CaFG Study: Assessment of 2019 Canada Food Guide Influence on Dietary Behavior and Education in Adolescents: A Cross-Sectional Study

Abstract Description (maximum 250 words):

**Introduction:** The incidence of adolescents with obesity and chronic comorbidities is increasing. One reason is caused by the overconsumption of certain food groups such as meat, dairy, and carbohydrates. To tackle this issue, the Canada Food Guide has been updated on 2019. However, due to the lack of outreach in social media, we speculate many young adults are not aware of the new changes to the food guide, which require further investigation on how we can improve the outreach information methods employed by the Canadian government to reduce costs in chronic illnesses related to poor dietary habits.

**Methods:** Students of McMaster University who were aged 18-24 were eligible to participate in a questionnaire that assessed two objectives: 1) if their dietary habits correlates with a high BMI, 2) if their lack of knowledge in the new CFG correlates to a high BMI, and 3) how can the CFG information be better implemented to attract the attention of adolescents, with an focus in how to incorporate the CFG in social media.

**Results:** Students are moderately aware about the new CFG recommended dietary habits. However, they claim that the CFG is not influential in their dietary habits or food choices.

**Conclusions:** To help reduce potential healthcare costs in Canada, it is essential that the feedback of the younger generation’s outreach preferences are followed. The CFG should thus consider adapting social media platforms to better influence the dietary habits of adolescents.

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Course Code: HTHSCI 3H06

Abstract Title: An Exploration of Herd Immunity in the Context of Phage-Bacteria Infection

Abstract Description (maximum 250 words):
Interest in phage therapy – the use of phages (bacterial viruses) to treat bacterial infections – continues to grow as the crisis of antibiotic resistance becomes increasingly urgent. However, as with antibiotics, bacteria can develop resistance to phages. Thus, the interplay between resistant bacteria and phages will only become more relevant as phage therapy advances. Some resistant individuals can waste viable phages in fruitless infection attempts by neutralizing any phages that attempt to infect them. Thus, resistant individuals may be able to protect their susceptible neighbours analogous to human herd immunity against human diseases. To test this hypothesis, a custom assay was designed to measure shifts from initial proportions of resistant to susceptible Streptococcus thermophilus after exposure to phage. In this context, the ratio of resistant to susceptible individuals that does not shift after exposure to phage represents the herd immunity threshold. Preliminary work confirms that the rates of phage infection are consistent between resistant and susceptible S. thermophilus. Preliminary calibration experiments have also confirmed the ideal growth-phase of the bacteria used to inoculate the assay and the concentration of phage needed to separate resistant from susceptible bacteria during measurement. The assay shows good reliability and validity, and it could be applied to study bacterial herd immunity. From medicine to food fermentation, this research lays the groundwork for better evaluating the effectiveness of phage-related interventions based on the bacterial community.

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Course Code: HTHSCI 4806

Abstract Title: Intake Processes of Hamilton Youth Employment Programs for Disadvantaged Youths

Abstract Description (maximum 250 words):

Objective: The purpose of this senior project is to use evidence-based design thinking principles to improve the intake process of youth employment programs operating in Hamilton.

Methods: The project used the design thinking methodology, an iterative research process aimed at creating user-centric solutions. Community research and interviews were conducted with various stakeholders operating within the youth employment space.

Results: Numerous community stakeholders were interviewed about their respective intake processes. Inputs from youth participants were below expectation due to the covid-19 situation. The results suggest that current intake processes lack standardisation, data collection, and user-friendliness. These inputs were compiled, and the team designed a new prototype employment program prototype.

Conclusion: Due to a variety of sources of competition, Hamilton’s youth employment resources lack sufficient collaboration – this is especially evident for the intake process of new youth clients. A standardised intake form that encompasses the best practices across stakeholders should improve the youths’ program experience, data collection, and further research.

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Contributions: Sahra Soudi, Nicole Walter, Christina Tarsitano, Simon Lebrun. Keywords: employment, NEET, youth, community research, YESS grant, Skills Link.

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Keywords: employment, NEET, youth, community research, YESS grant, Skills Link.
**Course Code:** HTHSCI 4R12

**Abstract Title:** Investigating the potential barriers in the genetic screening referral process for eligible patients with renal cell carcinoma in Canada

**Abstract Description** (maximum 250 words):
Approximately 3-5% of renal cell carcinomas (RCCs) are hereditary renal cell carcinomas (hRCCs). Mutations associated with hRCCs can be diagnosed using genetic testing. Receiving genetic testing would help physicians identify if the cancer is sporadic or hereditary, guiding treatment and management plans. Moreover, if a mutation is detected in a patient, their asymptomatic family member can be offered testing to determine if they harbour the same mutation which predisposes them to developing kidney tumours. A guideline published in 2013 outline the indicators of patient eligibility for hRCC genetic screening. Despite the publishing of the guideline, genetic referral rate in Canada remains low. This research project involves a systematic literature review to identify the potential barriers contributing to a low genetic referral rate among kidney cancer patients in Canada. The review suggested three main categories of barriers which include: 1) lack of physician awareness, 2) lack of time during appointment for referral, and 3) lack of access to genetic testing and results. The review concluded that there is limited literature investigating and addressing the barriers in genetic testing, especially ones for hRCC syndromes. In addition to increasing research effort in this field, several suggestions are proposed to address the aforementioned barriers, which include: 1) educational pamphlets and videos to increase physician and patient awareness, 2) printed guideline in physician office as visual reminders, 3) converting paper referral to online referral for a faster and easier referral process, and 4) developing regulatory framework and increasing funding towards genetic testing.

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