8th Annual

McMaster Medical Student Research Day

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MMSC
McMaster Medical Student Council

Michael G. DeGroote
SCHOOL OF MEDICINE

McMaster University
HEALTH SCIENCES

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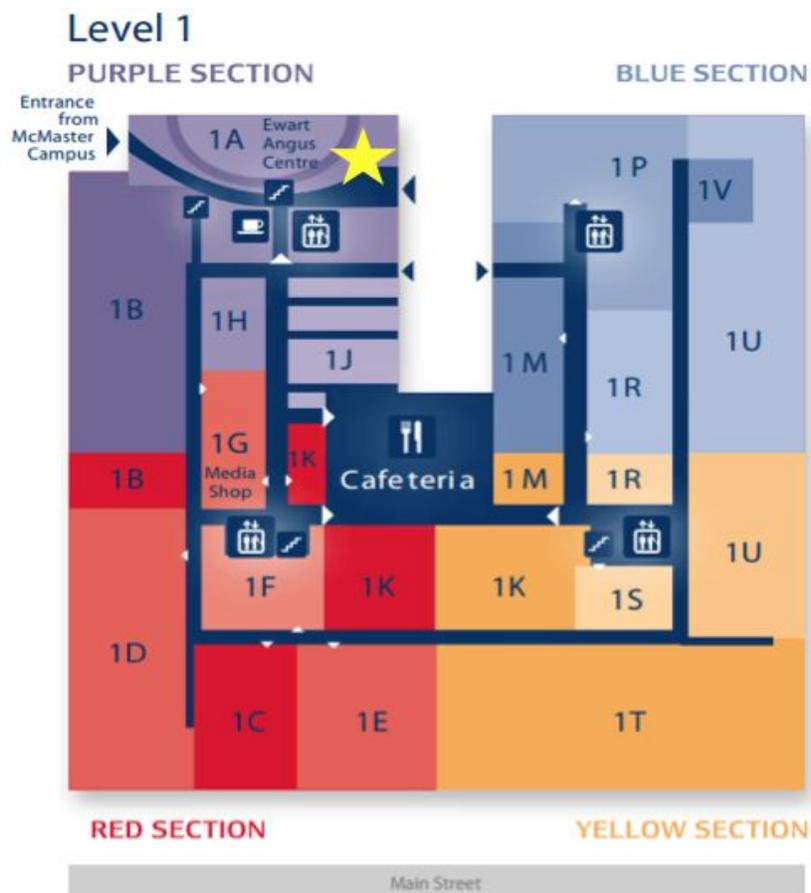
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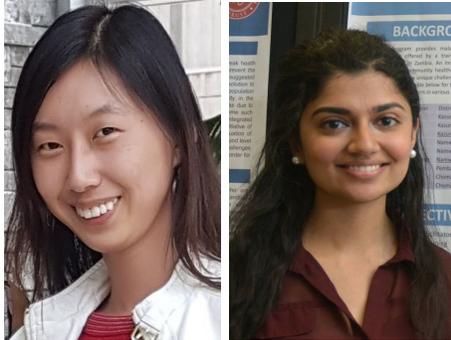
Marina Wang & Karishma Manji

Dear Medical Students, Faculty, and McMaster University community members,

Thank you for being here! We are pleased to welcome you to the 8th annual McMaster Medical Student Research Day (MMSRD).

Discoveries that change medical practice are constantly being made and clinicians play a large role in research today. Being at the front line of patient care place clinicians in a unique position to help guide and organize new research projects to better improve patient care and outcomes. Here at McMaster, evidence based practice is paramount and our medical students are imparted the importance of clinical trials and research from day one.

Many students at McMaster University's Michael G. DeGroote School of Medicine have already started being involved in research. From basic science to quality insurance

Thank you once again for your support of this year's MMSRD!

MMSRD History

McMaster Medical Student Research Day (MMSRD) was first founded in 2010 by Alex Kaplan (MD Class of 2012) to highlight the importance of research in bridging the bench-to-bedside gap. By providing a platform for interdisciplinary dialogue, critical appraisal and networking, MMSRD became an avenue to promote educational values that extended beyond the classroom, encouraging participants and attendees to harness both the scientific method and creative thinking to solve medical issues in all domains of health care.

MMSRD has now grown in scope and capacity, building upon previous years of experience led by the following medical student co-chairs: Alex Kaplan and Fareeha Qayyum (2010/11), Calvin Yeh and Stephanie Kletke (2011/12), Branavan Manoranjan and Zamin Ladha (2012/13), Ilana Hanes and Derek Chan (2013/14), Rebecca Rodin and Emerson Marinas (2014/15), and Roman Reznikov and Isabel Kim (2015/16).

The MMSRD committee is proud to showcase student's accomplishments in all avenues of research including the basic sciences, clinical research, medical education, population health, and health policy. This year, Karishma Manji and Marina Wang (2016/17) have recognized McMaster students' penchant for quality improvement research and introduced a separate award category for these projects given the distinct nature of this work and accessibility to medical students. Moving forward, MMSRD will hopefully continue to grow and provide important cross-talk opportunities for medical students and the broader community.

Keynote Speaker

Dr. Sonia Anand
B.A, M.D, Ph.D., F.R.C.P(C)

Dr. Sonia Anand is a Professor of Medicine and Epidemiology at McMaster University, and a vascular medicine specialist. She also holds the Heart and Stroke Foundation of Ontario/Michael G. DeGroote Chair in Population Health Research and a Canada Research Chair in Ethnic Diversity and Cardiovascular Disease. Dr. Anand conducts large population-based studies including two birth cohort studies funded by the CIHR and Heart and Stroke Foundation of Canada - one among South Asian women of the greater Toronto area and the second among Aboriginal women from the Six Nations Reserve, and she is a co-PI of the Canadian Alliance of Healthy Hearts and Minds study which is a national prospective cohort study using MRI to detect early vascular disease. Dr. Anand's work is widely published amongst academic journals and she teaches clinical epidemiology courses in methodology and cardiovascular disease at McMaster University. Her present research focuses upon the environmental and genetic determinants of vascular disease in populations of varying ancestral origin, women and cardiovascular disease.

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Abstracts - Oral Presentations

GridlockED: an educational board game for a simulated learning experience of patient flow through the emergency department

Joshua T. Rempel* (1), Paula E. Sneath (1), Daniel Tsoy (1), Alim Pardhan (2), Matthew Mercuri (2), Teresa M. Chan (2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) Division of Emergency Medicine, McMaster University, Hamilton, Ontario, Canada

Background: In the controlled chaos of the emergency department (ED) it can be difficult for medical trainees to recognize that there is definite order to the chaos, and many may never truly appreciate its complexity. How to best teach organization components of ED care to medical learners has not been examined. Didactic teaching cannot effectively portray the complexities of managing the ED. Much like education in cardiac arrest, trauma, and multi-casualty incident management, it is our belief that the management of patient flow through the ED can effectively be learned through simulation (1, 2, 3). Thus, we developed GridlockED, a board game that requires players to work cooperatively to manage a simulated ED to win the game.

Methods: Six months of iterative gameplay and review was used to develop GridlockED. Input from attending emergency physicians (for content validity), residents (fidelity), and medical students was integrated into the game through a Plan-Do-Study-Act (PDSA) model. We created a strategy game that allows learners to engage in high level decision-making about ED flow processes. The goal of the game is to work cooperatively with teammates to complete patient tasks and move patients through the ED to an ultimate disposition (e.g. admission, discharge). The final version of GridlockED includes all of the components necessary for gameplay, including a fully developed game board, game characters representing ED staff, patient cards, and win/loss conditions which have been finely tuned to allow for a challenge while maintaining engagement.

Conclusions: Initial responses to GridlockED from medical learners at various levels as well as staff physicians have been very positive, supporting it as both an engaging board game and potential teaching tool. We are excited to see it validated through future research trials and possibly incorporated into emergency medicine training at both student and postgraduate training levels.

ICU survival in mechanically ventilated stem cell transplant patients

Kira L Gossack-Keenan* (1), Mohammad Hamidi (2), Sangeeta Mehta (2), Bram Rochwerg (3)

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Background: The use of hematopoietic cell transplantation (HCT) in treating a variety of hematological malignancies has been steadily increasing. Historically, the survival rate for patients who become critically ill following HCT has been very poor1,2. Risk factors associated with higher mortality include requiring mechanical ventilation (MV) and renal replacement therapy (RRT). However, limited data is available to risk stratify HCT patients already on MV. This study aims to evaluate the relationship

between MV and mortality outcomes.

Methods: We conducted a retrospective chart review of all adult ICU patients who required MV within 90 days of HCT, over a 10 year period. Patients were excluded if they had previously been enrolled in the study, were intubated <24 hours, or were intubated primarily for procedure facilitation. Outcomes included complications of HCT, duration of MV, need for RRT, and mortality rates.

Results: A total of 37 patients met eligibility criteria (mean age 49.2 years, IQR=42-60, 62.1% male). Median duration of MV was 12.24 days in all patients; 9.22 days in patients who survived to hospital discharge, vs 13.2 days in non-survivors. The most common post transplant complications were: febrile neutropenia (81%), veno-occlusive disease (27%), cardiomyopathy (16.2%), cytomegalovirus reactivation (16.2%), and graft versus host disease (13.5%). Half of patients (51.4%) required RRT in the ICU, and the majority (78.4%) required vasoactive support during their first week of admission. Overall ICU mortality rate was 56.8%, with in-hospital mortality of 75.7%. One-year mortality was 81.1%, and was higher in the allogeneic versus autologous group (96.2% versus 45.5%). Importantly, among eight patients who required MV for over 21 days duration, none survived to be discharged from hospital.

Conclusions: This research provides important information in risk-stratifying patients who require MV post-HCT. While some patients may rapidly respond to treatments, others may fail to improve and require MV for extended periods. As demonstrated, none of the patients requiring MV for over 21 days survived to hospital discharge. This threshold provides important information for clinicians, patients and caregivers, who may consider a less aggressive and more comfort-directed approach to patient care following this period. This data will inform future research studies aimed at enhancing the care of this high-risk population.

Listening to the wazee and mamas: an environmental scan of the unmet needs of seniors in Matangwe, Kenya

Seema Emami (1), Samuel Yoon (1)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada

Background: The Matangwe Community Health and Development Program (MCHDP) serves 12 villages in the Lake Victoria region of Kenya. HIV/AIDS, unemployment, and access to nutrition represent significant challenges for virtually all members of this Luo community. Elderly villagers are at increased risk of poverty and poor health, in part due to high rates of urban migration and AIDS-related mortality of younger caregivers.(1,2) We conducted a qualitative environmental scan to identify the unmet needs of senior citizens in this region.

Methods: Vulnerable seniors were identified through consultation with village councils and interviewed over a three-week period. Two McMaster medical students conducted each interview; a Canadian-Kenyan MDHCP staff provided Luo-English translation. The AgeWell questionnaire, a validated South African scale, was adapted to assess demographics, socioeconomic status, independence, and psychosocial well being of interviewees. Descriptive statistics characterized group trends.

Results: Twenty-one female and seven male seniors were interviewed with a mean age of 73.6 years

and mean educational attainment of 3.73 years. Most seniors cohabited with grandchildren (70%) whereas 20% lived alone. 20% of participants reported no assistance from others for activities of daily living. Subsistence farming provided income for 40% of seniors, while three seniors did not have a reliable source of income. All respondents endorsed at least one subjective health complaint but only 5 reported regular access to healthcare. Assistance with agricultural labour was the most commonly expressed priority by seniors.

Conclusions: Seniors in the Matangwe region often endure multiple unmet health and financial needs. Women may be overrepresented in this group due to polygamy and widow-inheritance practices.(3) Increased food security and income supplementation emerged unanimously as priorities amongst or sample. We hope that our findings guide future grassroots projects through MCHDP such as senior meal delivery and health outreach clinics to improve outcomes and quality of life for seniors in the catchment area.

Understanding experiential interprofessional learning through the HEIGHTEN program (Horizontal Elective for Interprofessional Growth & Healthcare Team ENhancement)

Franziska Miller* (1), Paula E. Sneath* (1), Melanie Fortune (2), Laura Walmsley (2), Allison Brown (3)

(1) Michael G. DeGroote School of Medicine, Class of 2018, St. Catharines, Ontario, Canada; (2) Michael G. DeGroote School of Medicine, Class of 2017, St. Catharines, Ontario, Canada; (3) McMaster University – Niagara Regional Campus, St. Catharines, Ontario, Canada

Background: McMaster's undergraduate medical education program highly values the development of relationships with allied health professionals. A recent needs assessment found that, while understanding the role of other healthcare professionals is important to medical students, the existing interprofessional education (IPE) opportunities were generally poorly received. This was attributed to the underemphasis of two important qualities; 1) personal, and 2) interactive experiences. HEIGHTEN was developed by two c2017 undergraduate medical students to offer a one-on-one experiential IPE opportunity. HEIGHTEN participants, pre-clerkship medical students, work with a nurse on an internal medicine unit at the St. Catharines General Hospital, actively engaging in patient care. The pilot last year was received very positively; our goal this year is to understand how the program is experienced in order to embrace and nurture the aspects of the program that make it so successful.

Methods: Five participating pre-clerkship medical students and five nurses will be selected initially to participate in semi-structured interviews with a series of open-ended questions. Emerging themes will be identified initially through open coding. Relevant and important themes will then be selected for axial coding. Further participants may then be recruited to explore potential constructs. With this process, the hope is that a framework or theory for the HEIGHTEN experience can be developed in conjunction with existing literature and expert consensus. The framework will then be presented to a subset of participants to ensure that it is consistent with their experience.

Timelines: We will begin recruitment and initial interviews in May 2017. A framework is anticipated to be developed by September 2017.

Conclusions: We intend to disseminate our framework through conference presentations and manuscript submissions to peer-reviewed journals. A HEIGHTEN Implementation Kit was created last

year after the pilot period to assist other medical school programs in undertaking similar programs; the results here will also be incorporated into this package to ensure understanding and successful uptake.

A randomized comparative trial of the usage, knowledge retention and media preferences in undergraduate medical students using podcasts and blog posts

Kelly Lien* (1), Alvin Chin (1), Anton Helman (2), Teresa M. Chan (1)

(1) McMaster University, Hamilton, ON, Canada; (2) University of Toronto, Toronto, ON, Canada

Background: Podcasts and blog posts are gaining popularity in Free Open Access Medical education (FOAMed). However, there remains a paucity of research comparing the two media for undergraduate medical education. This study aims to investigate if there are differences in medical students' usage conditions, knowledge retention and preferences in the two types of media (podcasts, blog posts).

Methods: Medical students were block-randomized to either the podcast or blog post group according to their year of schooling. They completed an online assessment of their baseline knowledge on the subject matter and preferences within the various types of media. Participants then received access to learning materials and were given four weeks to complete the follow-up assessment. Simple descriptive statistical data were used to detail student preferences. Paired samples t-tests and a Repeated Measures Analysis of Variance (RM-ANOVA) were conducted to assess knowledge acquisition. A carry forward analysis was used to impute missing data from students lost to follow-up.

Results: A total of 65 medical students participated in our study (podcasts n=33, blog posts n=32). The initial survey suggests that students prefer general topic discussion and "approach-to" themes (68% and 84%, respectively). 55% of students in the podcast group preferred podcasts that were less than 30 minutes. None of the blog post group preferred a shorter text, and each blog post required a mean of 25 minutes to read. Completion of at least one follow-up assessment was comparable (68% podcasts, 70% blog posts). The podcast listeners tended to engage in multiple activities while using the learning material (e.g. at least 2-3 of the following: driving, eating, chores, taking notes, exercising), while the blog readers tended to do fewer activities (e.g. only 1 of the following: taking notes, eating, only reading). Both groups showed significant improvements in their test scores (Asthma: 22% improvement, Toxicology: 29%; p<0.01 for both), with blog posts demonstrating a larger but non-significant difference (RM-ANOVA, Topic*Modality F(1,59)=0.001, p=0.973).

Conclusions: This study suggests that podcasts and blog posts significantly improve medical student knowledge retention to a similar degree, but differ in usage conditions.

International law's effects on health and its social determinants

Steven J. Hoffman (1), Matthew Hughsam (1), Harkanwal Randhawa* (2), Lathika Sritharan (1), Gordon Guyatt (3), John N. Lavis (4), John-Arne Røttingen (5)

(1) Global Strategy Lab, Faculty of Law, University of Ottawa, Ottawa, Ontario; (2) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario; (3) Department of Health Research Methods, Evidence, and Impact, McMaster University, Hamilton, Ontario; (4) McMaster Health Forum, McMaster University, Hamilton, Ontario; (5) Division of Infection

Control and Environmental Health, Norwegian Institute of Public Health

Background: In recent years, there have been numerous calls for global institutions to develop and enforce new international laws. International laws are, however, often blunt instruments with many uncertain benefits, costs, risks of harm, and trade-offs. Thus, they are probably not always appropriate solutions to global health challenges. Given these uncertainties and international law's potential importance for improving global health, the paucity of synthesized evidence addressing whether international laws achieve their intended effects or whether they are superior in comparison to other approaches is problematic.

Methods: Ten electronic bibliographic databases were searched using predefined search strategies, including MEDLINE, Global Health, CINAHL, Applied Social Sciences Index and Abstracts, Dissertations and Theses, International Bibliography of Social Sciences, International Political Science Abstracts, Social Sciences Abstracts, Social Sciences Citation Index, PAIS International, and Worldwide Political Science Abstracts. Two reviewers independently screened titles and abstracts using predefined inclusion criteria. Pairs of reviewers then independently screened the full-text of articles for inclusion using predefined inclusion criteria, and then independently extracted data and will assess risk of bias for included studies. Where feasible, results will be pooled through subgroup analyses, meta-analyses, and meta-regression techniques.

Results: The findings of this review will contribute to a better understanding of the expected benefits and possible harms of using international law to address different kinds of problems, thereby providing important evidence-informed guidance on when and how it can be effectively introduced and implemented by countries and global institutions.

This moral coil: medical student attitudes toward medical assistance in dying

Eli X. Bator* (1), Bethany J. Philpott* (1), Andrew P. Costa (1)

(1) Michael G. DeGroote School of Medicine, McMaster University, Waterloo Regional Campus, Kitchener, Ontario, Canada

Background: In 2015, the Supreme Court of Canada struck down the ban on medical assistance in dying (MAiD). On June 17, 2016, Bill C-14 became nationwide law permitting MAiD. The bill places responsibility for administering MAiD on physicians and nurse practitioners. Medical students will become the first cohort of physicians to enter a system permissive of MAiD, and will play an important role in ensuring equitable access to care. This study assessed their views regarding MAiD, factors influencing these views, and their educational needs.

Methods: An exploratory cross-sectional survey was developed and distributed to medical students across all three years of the McMaster University undergraduate medical program. The study utilized multiple choice and Likert-type questioning to assess the study objectives. The investigators E.B. and B.P. administered the survey to participants during academic lectures and events from November to December 2015.

Results: A total of 405 students completed the survey for a response rate of 87%. The majority of students (88%) supported the Supreme Court's decision, 61% would provide the means for a patient to end their life, and 38% would personally administer a lethal medication. Most respondents (82%) felt that patients' MAiD preferences should be included in advanced care directives. Respondents who

placed importance on patient autonomy and medical education were more willing to provide MAiD. Conversely, those who placed importance on religious teachings and the potential for negative consequences of MAiD were less willing to provide it. Educational training desired by participants included medico-legal (91%), communication skills (80%), technical skills (75%), and religious (49%).

Conclusions: Medical students generally support MAiD, and many indicated that they are willing to be involved in providing this service. However, most students indicate a need for further education to navigate the difficult ethical and practical issues surrounding the subject.

Graft Choice and Return to Sport after Revision Anterior Cruciate Ligament Reconstruction: A Systematic Review and Meta-Analysis

Kay J (1), Naji L (1), de SA D (2), Simunovic N (3), Peterson D (2), Samuelsson K (4), Musahl V (5), Ayeni OR (2).

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Background: For an athlete undergoing ACL reconstruction, regardless of their level of play, often the most patient-important outcome is the ability to return to sport. Various graft types are currently being used in revision ACL reconstruction, however it remains unclear how graft choice affects the ability of athletes to return to sporting activities.

Objective: To evaluate the rate at which patients return to sport after revision ACL reconstruction based on the graft choice.

Methods: The databases PubMed (MEDLINE), Ovid (MEDLINE), and EMBASE were searched from database inception until March 18, 2016 by two reviewers independently. The systematic electronic search yielded 2,666 studies. Inclusion criteria were English-language studies investigating revision ACL surgery on humans of all ages participating in sports of all levels with reported return to sport outcomes for patients stratified by graft choice. Conference papers, book chapters, review articles and technical reports were excluded.

Results: Eighteen studies (n=1001 patients) met the inclusion criteria for our analyses with a mean follow-up of 60.7 months (range: 12 to 1008 months). One study was of level II evidence, two were level III, and 15 were level IV. A meta-analysis of proportions was used to combine the rate of return to pre-injury level for each graft type using a random effects model. The pooled rate of return to pre-injury sporting level was 67% (95% confidence interval [CI]: 63% to 71%; I2 = 11.13%) for patients with a bone-patellar-tendon bone (BPTB) autograft, 55% (95% CI: 39% to 71%; I2 =76.71%) for patients with a hamstring tendon autograft and 64% (95% CI: 56% to 74%; I2 = 82.12%) for patients with allografts.

Conclusions: Pooled estimates suggest a higher rate of return to sport at the pre-injury level after revision ACL reconstruction using BPTB autografts in comparison to HS autografts and allografts. However, there is a lack of high quality, prospective, comparative studies evaluating rate of return to

sport from which to derive definitive conclusions on the efficacy of different graft choices.

Evaluating the usability of advance care planning e-modules for teaching undergraduate medical students

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Background: Advance care planning (ACP) is a process that helps individuals plan their healthcare for a time when they cannot make decisions for themselves. Although ACP has been shown to improve end-of-life experiences for patients and their families1, physicians have identified a number of barriers to these conversations and have indicated the need for specific ACP training2,3. My Health, My Wishes, My Plan is a set of e-modules created by the East Toronto Health Link (ETHeL) to increase knowledge of, improve attitudes towards, and enhance communication skills in ACP amongst healthcare providers. The goal of this project is to determine the usability (feasibility, acceptability, and clinical sensibility) of the ETHeL e-modules for teaching undergraduate medical students about ACP. To our knowledge, no such training tools have been evaluated for their impact on undergraduate medical students in Canada.

Methods: A sample of 12 undergraduate medical students participated in a 2-hour interview to review the ETHeL e-modules and complete an evaluation instrument comprised of Likert scale and open-ended responses.

Results: The ETHeL e-modules received high scores on their language and ease of use (mean score of 4.75 and 4.5 out of 5, respectively). Participants reported that the modules were very helpful for teaching undergraduate medical students about ACP (mean score of 4.67 out of 5). They were likely to recommend the tool to a colleague, but were less likely to use the tool themselves if it was recommended to them (mean score of 4.42 and 3.58 out of 5, respectively). Participants attributed this to the overwhelming number of resources presented to them in medical school, and suggested that the ETHeL e-modules become incorporated as a mandatory component of their Professional Competencies curriculum.

Conclusions: The ETHeL e-modules are easy to use and understand, and are helpful for teaching undergraduate medical students about ACP.

Increasing student feedback on medportal to enhance McMaster's medical education

Kathryn G. Chan (1), Julie La (1), Michael J. Nixon (1)

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Background: Student feedback is essential for the delivery of medical education. Both McMaster University and the Committee on Accreditation of Canadian Medical Schools formally identify that feedback is a necessary tool to monitor and improve the quality of MD programs. A close examination of the infrastructure for online feedback on Medportal reveals that the current system does not meet

student needs, with several gaps in the feedback process that when aligned lead to system failure.

Methods: Rates of feedback for Large Group Session evaluations were collected for the classes of 2016, 2017, and 2018 and the number of tutorial case reviews was extracted for the classes of 2017 and 2018. A needs assessment was collected to ascertain the student perspective.

Results: Overall, rates of feedback were extremely low, trending downwards over time to where on average only 3% of the class is contributing feedback by the end of MF3. However, patterns in the data show that feedback rates can change with intervention and add promise to the potential for improvement. Although 92.7% of students feel that feedback is important, only 20% feel that their feedback is valued by colleagues and peers. This disparity again points to a need to change the current feedback process at McMaster. From our needs assessment, students reported that providing evidence of change would be the intervention most likely to increase feedback rates. Barriers to feedback identified include submitter identification and an absence of evidence demonstrating change based on previously collected feedback.

Conclusions: This project recommends first anonymizing all Medportal feedback and subsequently demonstrating evidence of change during the introductory lecture of each subunit. These interventions are recommended for incorporation via Plan-Do-Study-Act cycles in a step-up approach with a goal of increasing feedback on Medportal by 25%.

Hyperchloremia in critically ill pediatric patients, the HyCCiP study

Adrian Bulfon* (1), Sorina Stef* (2), Hakem Alomany (3), Thuvaraha Vanniyasingam (4), Brooke Comrie (5), Katina Zheng (6), Samuel Laskey (6), Dr. Natalie Anton (7), Dr Karen Choong(3)

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Background: Although evidence suggests that isotonic solutions are safer than hypotonic for maintenance IV fluids in children, it is unclear whether this has translated into clinical practice. Furthermore, research suggests that normal saline may be associated with hyperchloremia, which is associated with morbidity and mortality. The objectives of this study were to determine IV maintenance fluid practices and the incidence of iatrogenic hyperchloremic metabolic acidosis (HCMA) in critically ill children.

Methods: A retrospective chart review was done in the Pediatric Intensive Care Units (PICUs) at McMaster and Stollery Children's Hospitals. All patients aged under 18 years admitted between January 1st 2015 – January 31st 2016, and receiving at least 50% of their maintenance fluid requirements parenterally, were included. The primary outcome of interest was IV maintenance fluid prescription practices. Secondary outcomes included the incidence of HCMA in the first 72 hours of admission, predictors of iatrogenic hyperchloremia and HCMA, the association between HCMA and clinical outcomes. We calculated that a sample size of 700 patients will enable us to achieve our primary and secondary outcomes. Descriptive analyses were used to present demographic data and the primary

outcome, and logistic regression was used to evaluate the predictors of HCMA.

Results: Of 771 patients admitted between January 1st 2015–January 31st 2016, 543 were eligible. Median age was 68 months and 56% were males. 402 (74%) were medical and 141 (26%) were surgical patients. 290 (29%) patients developed iatrogenic HCMA within 72h of PICU admission. Ongoing analyses are underway to determine predictors of HCMA and the association with adverse events.

Conclusions: Iatrogenic HCMA is common in PICUs and is associated with morbidity and mortality. This study will provide an understanding of current IV fluid practices, and how to minimize IV fluid associated morbidities.

Medication adherence among newcomers: a pilot study

Sarah Saliba (1,2), Sue Grafe (3) , Christian Kraeker (4), Tim O'Shea (5), Sue Troyan (6), Anne Holbrook (6)

(1) Bachelor Health Sciences Program, McMaster University; (2) Michael G. Degroote School of Medicine, McMaster University; (3) Refuge Center for Newcomer Health; (4) Division of General Internal Medicine, Department of Medicine, McMaster University; (5) Division of General Internal Medicine and Infectious Diseases, Department of Medicine, McMaster University; (6) Division of Clinical Pharmacology and Toxicology, Department of Medicine, McMaster University

Background: The Refuge Newcomer Clinic in Hamilton, Ontario provides free healthcare to low-income newcomers, including both primary health care and selected specialty services. Although some government coverage for drugs is available, there has been concern about cost-related non-adherence in this group. The objective of this pilot study was to identify the barriers faced by those who seek care at Refuge in accessing and maintaining medication regimens, with a focus on whether or not cost is a significant barrier.

Methods: We conducted in-person interviews with patients using a questionnaire modified from the Canadian Community Health Survey and the 'Beliefs on Medicines Questionnaire' (1). The questionnaire was developed in collaboration with several of the investigators based on consultation with staff and patients at Refuge, to address issues with obtaining and understanding a prescription, filling the prescription and taking the drug regimen. Interviews were conducted in both English and Arabic. Results were analyzed using descriptive statistics.

Results: Ten patients were recruited. All participants reported either picking up medications late, not picking up medications at all or skipping doses. Reasons included worries about side effects and medication dependency. Three of the ten participants reported cost as a reason for non-adherence, despite having IFHP or ODB coverage.

Conclusions: This small pilot study suggests problems with medication adherence amongst a newcomer population, including perceptions of adverse effects, dependence and cost. Despite the availability of government coverage, cost remains a significant barrier to medication adherence in this population.

Morning Poster Presentations

Perceptions of the effectiveness of advanced practice nurses on a neurosurgery unit
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Abstracts - Morning Poster Presentations

Perceptions of the effectiveness of advanced practice nurses on a neurosurgery unit

Kira L Gossack-Keenan* (1), Erin E. Mutterback (2), Alanna M. Keenan (3), Monika E. Pantalone (2), Kristi M. Velthuizen (4)

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Background: The Ottawa Hospital developed a framework for the Advanced Practice Nurse (APN) role to improve outcomes for complex patient populations through advanced nursing practice in five domains: clinical practice, consultation, research, education and leadership. 1,2 An innovative APN role was implemented in the Neurosurgery program to manage patients' medical conditions and maintain optimal communication within the team.

Methods: The goal of this study was to evaluate perceptions of the effectiveness of the implementation of an APN role on an in-patient Neurosurgery unit. A pre-and-post implementation survey design, incorporating both qualitative and quantitative data, was utilized. Three primary outcomes were measured: pre-implementation questionnaire (nurses), post-implementation questionnaire (nurses and residents) and number of pages to the on-call resident.

Results: Survey scores by nurses and residents indicated improvement across all aspects studied. Aspects included job satisfaction, delivery of patient care, time management, coordination of care and oral/written communication. Average scores increased from 1.1 to 2.6, reflecting an overall statistically significantly increase (on a scale from 0-3, with 3 indicating the most favourable score). The number of pages to the on-call resident physician also showed a decrease.

Conclusions: Perceptions of patient care delivery and interprofessional collaboration significantly improved following implementation of the APN role. Responses indicated that APNs had a significant positive impact on patient care and improved nurses and residents' job satisfaction. This study has important quality improvement implications, as the positive results provide a case for the implementation of APN roles in other units, as a way of improving overall patient care.

Improving student feedback in the MD program: a quality improvement study

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Michael G. DeGroote School of Medicine

Background: Feedback skills are a cornerstone of effective communication, and act as precursors to professionalism in practice and collaborative learning. The McMaster MD program expects students to provide and receive feedback in the tutorial, clinical skills, and professional competencies curricula that is consistent with the six domains of quality. However, there are no formal opportunities for students

to learn how to provide actionable and effective feedback, thus creating a quality gap. Our aim is to improve student knowledge of how to give and receive constructive feedback by 15%.

Methods: A need assessment of feedback competencies for first year McMaster Medicine students will be conducted using both survey and focus group approaches to ascertain the root causes of the feedback quality gap. All findings will be compiled in the forms of a fishbone diagram and process map to inform the development of a pilot intervention to be launched in MF4. The session will be evaluated using pre and post session surveys measuring student knowledge and confidence with feedback. A quality improvement methodology, drawing on the use of multiple Plan-Do-Study-Act (PDSA) cycles, will be used alongside feedback to modify the intervention prior to its potential implementation for the Class of 2020 in September 2017.

Results: The primary intervention will be to provide students with resources that introduce best practices in giving and receiving feedback. These may manifest as: online modules, a large group session, and/or integration with current tutorial and professional competencies curricula. Success will be assessed through outcomes, process, and balancing measures including: assessing knowledge acquisition, the use of new resources, and balancing time for feedback with coverage of tutorial content.

Conclusions: We anticipate that the proposed intervention will increase students' comfort and knowledge around providing and receiving constructive feedback, making theirs and their peers' group learning experiences more rewarding.

Sexually transmitted infections: a quality improvement initiative (STI-QI)

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Background: Sexually transmitted infections (STIs) continue to pose significant population burdens in Canada. Many STIs do not present with classic findings and thus go undiagnosed. Chronic infection, even asymptomatic, carries risks of life-altering morbidities such as pelvic inflammatory disease (PID). PID is a painful condition that causes infertility and higher risk of ectopic pregnancy. HIV and Hepatitis C virus transmission is also increased in the presence of an STI. A recent study published by Tomas et al. found that more than 20% of women presenting to the emergency department with genitourinary (GU) symptoms tested positive for a non-viral STI. Nearly 40% of these cases were misdiagnosed by the emergency physician and treated as a urinary tract infection (UTI).(1)

Methods: Our quality improvement (QI) project is designed to more accurately investigate and diagnose GU complaints. Currently, our project is based out of several local walk-in clinics. The intervention population includes all females aged 16 to 65 that present with any GU symptom to

participating walk-in clinics who are assessed by a physician affiliated with the project.

1. We abstracted data from existing clinic records over the previous year to determine the baseline UTI and STI testing rate.

2. We implemented a protocol to test the urine of all women in the study population for urine culture, Chlamydia trachomatis, Neisseria gonorrhea, and Trichomonas vaginalis. Patients with positive results are followed-up and treated per usual clinic/physician practice.

Results: This is an ongoing QI initiative; data monitoring via the clinics' electronic medical records began at our project launch in November 2016. Results are being collected biweekly; scale up and monthly QI cycles are ongoing.

Conclusions: Sexual health is an important domain of public health that affects many Canadians. We anticipate our QI initiative improving the health and quality of life of women with asymptomatic or atypical presentations of STIs.

Investigating the efficacy of the images panel in tutorial cases -- a QI Approach

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(1) Michael G. DeGroote School of Medicine – McMaster University

Background: Tutorial cases form the crux of McMaster's problem-based learning curriculum, and the resources that accompany the case text-prompt are frequently used by students to facilitate their learning. These resources include a large variety of diagnostic and histology images. However, these images often lack clarity and are therefore underutilized by learners during tutorial preparation. We wish to improve upon student learning of content provided in the "Images Panel."

Methods: Needs assessment surveys will be sent to all students attending Michael G. DeGroote School of Medicine, irrespective of year and campus, to assess student comprehension and utilization of the Images panel. Upon a root-cause analysis using a fishbone diagram, it was determined that a major factor contributing to the underutilization of the Images Panel was inadequate clarity of the provided images. Two independent assessors subsequently evaluated existing images panels to identify images that could use additional supplementation. Furthermore, Plan-Do-Study-Act (PDSA) cycles will be used in tangent with ongoing feedback to monitor and evaluate the intervention before widespread implementation. Student satisfaction and self-reported efficacy will be assessed through questionnaires pre- and post-intervention, and will be repeated upon future iterations of the intervention.

Results: Through a preliminary analysis of existing images, gaps were identified across Medical Foundations (MFs), with major gaps in MF1 cases (44% of existing images). Based on results from the preliminary analysis, flagged tutorial images will be improved by juxtaposing pathological images with a normal image and highlighting relevant details of pathological images.

Conclusions: This intervention will streamline tutorial preparation and allow students opportunities to

apply medical knowledge to interpret pathological findings. Anticipated outcomes from this QI project include improved understanding of diagnostic and histology images, which may enhance interpretation of pathological findings in future clinical settings.

Introduction of online quizzes to enhance anatomy knowledge confidence: a quality improvement project in medical education

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Background: The current lack of feedback on retention of anatomy content in our curriculum compromises knowledge confidence and education satisfaction. Lab manuals vary between campuses, creating inequity in anatomy knowledge which heightens the importance of frequent and detailed knowledge checks. The resource-intensive limitations of an OSPE which necessitate its brevity and infrequency (one per Medical Foundation) suggest supplementation by a more resource-efficient mode of evaluation which can be implemented across campuses with greater frequency. The aim of this quality improvement project is to improve student confidence in anatomy education and knowledge through the implementation of optional online quizzes to complement each anatomy session.

Methods: Using a quality improvement fishbone diagram, we identified knowledge assessment as a quality gap in the anatomy program. We propose the implementation of online quizzes, consisting of 5-10 multiple-choice questions, to allow students to test their understanding of the content covered in that week's session. This would be effective as a learning check and long-term recall resource, as the quizzes could be retaken at any point during their medical education. A needs assessment survey completed by current McMaster medical students has confirmed the identified quality gap and the appropriateness of our intervention.

Results: This quality improvement project addresses the lack of confidence that pre-clerkship students have in their anatomy knowledge. Thus far, student feedback has indicated a desire for more frequent feedback on knowledge retention.The use of repeated surveys will evaluate the outcome measure of increased confidence in anatomy knowledge, the process measure of student usage of the proposed quizzes, and whether the intervention is found to be burdensome by administrators.

Conclusions: This intervention will increase knowledge confidence, providing a mode of self-directed evaluation which is both efficient and accessible for students. This standardizing consolidation tool is expected to improve student satisfaction with anatomy education.

Changes in the intra-abdominal fat depots and associations with glycemic parameters In patients with type 2 diabetes undergoing bariatric surgery

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Background: Bariatric surgery has been shown to induce remission of diabetes in the majority of patients. The objectives of this study were to characterize changes in the intra-abdominal fat depots in patients with type 2 diabetes undergoing bariatric surgery, and to explore associations between specific fat depots and glycemic response to a mixed meal.

Methods: We conducted a pilot observational study in 18 obese patients with type 2 diabetes undergoing bariatric surgery. Liver and pancreatic fat content, and abdominal visceral (VAT) and subcutaneous (SAT) adipose tissue volumes were determined by MRI before surgery and at 2 and 4 weeks after surgery. A liquid mixed meal test was also conducted at these time points. Generalized estimating equations were used to explore associations between variables.

Results: Seventeen participants completed the study; 12 underwent gastric bypass and 5 underwent sleeve gastrectomy. The AUCglucose0-150min declined from 1632.9±516.6 (mean±SD) at the pre-surgery visit to 1305.1±404.2 min*mmol/L at 4 weeks (p=0.02; 20% decrease). The percent liver fat content decreased from 18.2±7.7% before surgery to 10.2±3.6% at week 4 (p<0.0001; 44% decrease), while the pancreatic fat content did not change significantly (p=0.50). The intra-abdominal VAT and SAT volumes declined by 452.7±282.2 cm3 (p<0.0001 week 4 vs 0; 24% decrease) and 304.4±268.5 cm3 (p=0.0003 week 4 vs 0; 7% decrease), respectively. Lower pancreatic fat content (β coefficient -204.1 (95% CI -217.4, -190.9) min*mmol/L per 10% increase) and higher VAT (β coefficient 268.5 (95% CI 268.2, 268.7) min*mmol/L per 1000 cm3 increase), but not liver fat content (p=0.14) and SAT (p=0.27), were found to be significant univariate predictors of the AUCglucose0-150min measured at 3 time points.

Conclusions: There are substantial declines in liver fat and VAT in patients with type 2 diabetes shortly after bariatric surgery which are accompanied by reductions in glucose excursions after a meal.

Introduction of a self-assessment tool to enhance anatomy education

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Background: Comprehensive anatomy education is fundamental to learning medicine. It allows students to develop a better understanding of surgical procedures, medical physiology and the rationale for many clinical exams. McMaster's current anatomy program involves a self-directed approach where students are infrequently evaluated on their knowledge. This is concerning for reasons: 1) there is limited opportunity for active recall and test-enhanced learning, and 2) students cannot determine areas of weakness in a timely manner. Our group proposes the addition of several self-assessment ("mock-OSPE") stations to the bi-weekly anatomy sessions, which will preserve the

benefits of self-directed learning, while introducing an opportunity for active learning.

Methods: We intend to utilize quality improvement methodology to implement our intervention. To gauge student perspectives around the current anatomy program, we conducted a needs assessment survey. We will design a fishbone diagram and conduct a 5-Why's analysis to explore the systemic factors contributing to this gap. Class input and identification of contributing factors will allow us to optimize our mock-OSPE intervention, which will then be implemented in a graduated basis, as part of multiple Plan-Do-Act-Study (PDSA) cycles. Through such an approach, we will be able to progressively improve the intervention quality.

Results: Using data collected from the PDSA cycles, we intend to refine our intervention by addressing components such as the number of stations offered and the content being tested. We will assess whether the intervention improves the quality of the anatomy program and enhances student learning using post-intervention surveys. Ideally, the intervention could be implemented for a future class following optimization, provided it is found to be useful.

Conclusions: We believe that implementing this intervention will lead to increased student satisfaction with their anatomy knowledge with a parallel increase in OSPE scores, and pave the way for a more effective anatomy education program.

Integration of simulation-based learning to enhance the interprofessional education curriculum at McMaster University

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Background: Interprofessional education (IPE) is a vital aspect of healthcare education. There is a need to improve the timeliness, effectiveness, student-centeredness and equity of IPE in the current McMaster medical curriculum. This gap leads to silos being established around health professions at the student level. Poor interprofessional communication and collaboration jeopardizes patient safety and student integration within interprofessional teams in clinical settings. Simulated clinical experience has been shown to improve interprofessional perceptions, attitudes and competencies amongst health professional students1. We aim to design and implement a simulation program for medical and allied health students to enhance existing IPE, thus improving medical students' knowledge, skills and attitudes towards interprofessional collaboration.

Methods: Quality improvement methodology and tools, specifically the fishbone diagram approach, were used to identify gaps in the current IPE curriculum. A needs assessment is being conducted to identify medical students' attitudes and satisfaction regarding the curriculum to inform design of the simulation intervention and determine receptivity. After creating a preliminary plan, we will facilitate several Plan-Do-Study-Act (PDSA) cycles to refine our proposed intervention. Outcome measures of students' knowledge, skills and attitudes will be assessed using RIPLS (Readiness for Interprofessional Learning Scale). Balancing interventional impact on the existing curriculum will be assessed through

meetings and a survey of students and administrators.

Results: An overview of our proposed intervention's structure and timeline will be presented based on findings from our needs assessment, along with a framework detailing the pilot phase and plan for widespread implementation. Anticipated results include improved understanding of other health professionals' roles, perceptions and confidence in interprofessional collaboration.

Conclusions: We aim to enhance IPE by fostering engagement between medical and allied health students through a pre-clerkship simulation-based program. This will enable medical students to effectively integrate into health care teams in clinical settings, and develop competence in interprofessional care.

Patient perceptions regarding physician reimbursements, wait times, and out-of-pocket payments for anterior cruciate ligament reconstruction in Ontario

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Background: Currently, there is a lack of knowledge regarding patient perceptions surrounding physician reimbursements, appropriate wait times, and out-of-pocket payment options for anterior cruciate ligament reconstruction (ACLR). Our objective was to determine the current state of these perceptions in an Ontario setting.

Methods: A survey was developed and pretested to address patient perceptions about physician reimbursements, appropriate wait times, and out-of-pocket payment options for ACLR using a focus group of experts and by reviewing prior surveys. The survey was administered to patients in a waiting room setting.

Results: Two hundred and fifty completed surveys were obtained (79.9% response rate). Participants responded that an appropriate physician reimbursement for ACLR was $1000.00 and that the Ontario Health Insurance Plan (OHIP) reimbursed physicians $700.00 for ACLR. Seventy-four percent of participants responded that the OHIP reimbursement of $615.20 for the procedure was either lower or much lower than what they considered to be an appropriate reimbursement for ACLR. Over 90% of participants responded that an ACLR should occur within 90 days of injury. Thirty-five percent of participants were willing to pay $750.00 out-of-pocket to have an ACLR done sooner, while 16.4% of participants were willing to pay $2500.00 out-of-pocket to travel outside of Canada for expedited surgery.

Conclusions: This survey study demonstrates that patients' estimates of both appropriate and actual

physician reimbursements were greater than the current reimbursement for ACLR. Further, the majority of individuals report that the surgical fee for ACLR is lower than what they consider to be an appropriate amount of compensation for the procedure. Additionally, nearly all respondents believe that a ruptured ACL should be reconstructed within 90 days of injury. Consequently, a number of patients are willing to pay out-of-pocket for expedited surgery either in Canada or abroad.

Arthroscopic management of septic arthritis of the shoulder: a systematic review

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Background: To investigate the use of shoulder arthroscopy in the management of septic arthritis; specifically, indications for shoulder arthroscopy, patient outcomes following shoulder arthroscopy, and complications arising from the procedure.

Methods: Three databases, including PubMed, MEDLINE, and EMBASE, were used to search the literature from database inception to February 1st, 2017. Systematic literature screening and data abstraction was performed independently and in duplicate to present a review of the literature reporting on outcomes of shoulder arthroscopy for the management of septic arthritis in the native shoulder.

Results: Overall, 27 studies (19 case reports and 8 case series), were identified, including 115 patients (121 shoulders). The mean follow-up period was 29.1 months (range, 1-199 months). The indications for shoulder arthroscopy due to infection included pain; limited range of motion; swelling, erythema, and tenderness; fever; elevated leukocyte, erythrocyte sedimentation rate (ESR), and/or C-reactive protein (CRP) levels; synovial aspirate findings; and/or imaging findings. Overall, 46 patients (40%) achieved infection eradication and functional improvement after a single arthroscopic procedure. However, 43 patients (37%) experienced ongoing symptoms or complications, including 32 patients (30%) who required revision arthroscopic procedures and 7 patients (6%) who ultimately underwent an open arthrotomy procedure for septic arthritis management. Poor outcomes, including the need for revision surgery, were more frequently observed in patients with delayed diagnoses and management, as well as pre-operative immune-compromised states.

Conclusions: Arthroscopic management of native shoulder septic arthritis can yield can yield alleviation of pain symptoms, return to full range of motion, normalization of inflammatory markers and body temperature, and full return to daily activities and sports. However, current literature reports a high re-operation rate, which may correlate with poor patient prognostic factors, including the severity of the infection at the time of arthroscopy and the presence of an immune-compromised state.

Implementing an online self-assessment tool to improve knowledge retention in a self-directed undergraduate medical curriculum: a medical education quality improvement project.

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Background: Existing student assessment tools at the Michael G. DeGroote School of Medicine are resource-intensive, limited in comprehensiveness, and infrequently administered. Currently, a student-centred focus is lacking, as there are no assessment tools catering to the diverse learning styles of students. Furthermore, optional evaluations to gauge knowledge without evaluative pressure are absent. Research in cognitive psychology has demonstrated that repeated test-enhanced learning is more effective than repetitive or elaborative studying for knowledge retention, recall accuracy, and performance of skills (1-3). Thus, the proposed project involves introducing a comprehensive, online, self-directed assessment system with student-written, faculty-reviewed questions and immediate, detailed feedback. The objective is to measure changes in participants' knowledge retention and comfort with tutorial concepts over the course of one subunit.

Methods: Using a fishbone diagram approach, an opportunity for improvement in knowledge retention and confidence was identified. A needs assessment of McMaster medical students' experiences and attitudes towards current evaluation systems will be conducted. The proposed self-testing tool will be implemented in a pilot project. PDSA cycles will be used to continually monitor, improve and expand the project. Pre- and post-implementation surveys and assessments will measure changes in students' knowledge retention and perceived confidence of learned concepts. Student and faculty feedback about the self-testing tool and patterns of usage data will be collected.

Conclusions: Developing a comprehensive question bank facilitates student access to assessment materials. Other aspects of the curriculum, including anatomy and professional competencies, may be added to the question bank in the future. This initiative relies on student engagement to be completed, with minimal faculty resources required. Overall, introducing an optional, student-motivated, non-competitive testing system may improve student confidence and knowledge retention, translating to improved clinical reasoning and patient care with minimal expense of resources.

A survey to understand intensive care unit (ICU) nurses' perspectives on pain, agitation and delirium (PAD) management, a single center study

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Background: Delirium is a common manifestation of acute brain dysfunction in critically ill patients. It is associated with poorer clinical outcomes 1-2-3-4-5-6-7-8-9. The American College of Critical Care Medicine developed guidelines for PAD management in order to decrease delirium rate 10-11-12-13. The implementation of PAD guidelines in academic centers has been shown to improve clinical outcomes 14-15. However, the uptake of the PAD guidelines in community hospitals is unclear. Moreover, data on nurses' perspectives on PAD management in community ICU are inadequate.

Methods: We administered anonymous survey to understand nurses' perceived knowledge, practice, satisfaction, and barriers to PAD management. The survey consisted 23 questions (modified Likert scale, multiple choice or open ended) which addressed: level of experience, comfort in PAD assessment/treatment, scenario based questions, satisfaction towards nurses' and physicians' PAD management, and barriers to PAD management.

Results: We had a 99% response rate (81 nurses responded). The mean ICU nursing experience was 6 (3-15) years. The nurses felt equally comfortable with the assessment of pain and agitation but not of delirium. They felt more comfortable in treating pain than agitation and they did not feel comfortable in treating delirium. There were variable responses on what best PAD management should be. Only 50% of the nurses felt satisfied with PAD management. Most nurses were interested in a quality improvement (QI) initiative and believed it would increase satisfaction. Multiple barriers to optimal PAD management were identified.

Conclusions: Nurses are less comfortable with the management of delirium than of pain/agitation and satisfaction of PAD management can be improved. A QI initiative is perceived as beneficial in the improvement of PAD management in the ICU.

Endoscopist- versus anesthesiologist-administered propofol in gastrointestinal endoscopy patients: A systematic review of safety outcomes

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Background: Propofol is the ideal sedative agent for outpatient gastrointestinal endoscopic procedures. Recently, there has been controversy over who should administer propofol in these settings given that it is a respiratory depressant with a narrow therapeutic range and no reversal agent.1 Its potential for oversedation and adverse hemodynamic effects has raised questions on the level of expertise required to handle complications.2 This systematic review aims to evaluate whether non-anesthesiologist administered propofol (NAAP) leads to a number of adverse events no different than anesthesiologist-administered propofol (AAP) in patients undergoing gastrointestinal endoscopy.

Methods: MEDLINE, CINAHL, EMBASE, Web of Science, and the grey literature were searched for studies comparing NAAP and AAP in adults undergoing upper and/or lower endoscopy. Advanced

endoscopic procedures were excluded. Primary outcomes included airway interventions, cardiopulmonary events, mortality, and patient preference.

Results: From a total of 602 articles, five met our inclusion criteria. Among all five, NAAP and AAP were comparable in gender and ASA classification. Rates of airway intervention, hypotension, and bradycardia were similar between AAP and NAAP in the studies that reported these outcomes. 3 - 7 In three studies, there was no mortality with AAP or NAAP.3 - 5 In another three studies, patients were surveyed about their willingness to repeat the procedure under identical circumstances. In two of those three, there were no differences between NAAP and AAP.3, 6 In one study, there was a higher proportion of patients in the AAP group who would not repeat the procedure.7

Conclusions: In this systematic review, we gathered the evidence comparing patient safety and preference in AAP versus NAAP. We concluded that there is no convincing evidence to suggest a difference. However, our review is limited by inconsistency of outcome reporting among the included studies. Future studies should aim to standardize patient-important outcomes.

Development of an interprofessional education event using experiential learning from a patient's perspective: a quality improvement in medical education project

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Background: Interprofessional education (IPE) happens when two or more professions learn with, from or about each other in order to cultivate collaboration and understanding with the aim of improving quality of care (1). Many of the current pre-clerkship IPE events are not effective for learning, not timely, and do not align with student preferences (2). The aim of this Quality Improvement project is to ensure that pre-clerkship students improve their understanding of the scope of practice of other healthcare professionals before clerkship by 50%.

Methods: We seek to implement a clinical IPE event that pairs a student with a patient throughout multiple clinical encounters with different healthcare professionals in order to gain an appreciation of their role in patient-centered care. Our project uses a quality improvement methodology to identify a gap in IPE programs currently offered to medical students at McMaster University. First, we used a fishbone diagram to identify the root causes of poor pre-clerkship student understanding of the role that allied health professionals play in patient-centered care. Next, we will use a needs assessment survey to understand the quality gap and modify our proposed solution. We will also use Plan-Do-Study-Act cycles to adjust our intervention as it is progressively implemented.

Results: The anticipated outcomes of our intervention include increased understanding of scope of practice for each allied healthcare professional, increased enthusiasm for IPE events, and increased awareness of patient perspective.

Conclusions: We propose a quality gap in IPE education, which we will confirm using a needs

assessment survey. We anticipate our IPE event will better complements students' preferences and allows more effective IPE education at the Michael DeGroote School of Medicine.

Using a quality improvement approach to enhance curriculum domain integration within the McMaster Undergraduate Medical Education (UGME) program COMPASS curriculum

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Background: Upon entering clerkship, medical students are expected to integrate and apply medical science, clinical, ethical, and social skills learned in pre-clerkship to patient care. McMaster's UGME curriculum embraces integration with the implementation of problem-based learning (PBL) during pre-clerkship. Longitudinal outcomes of PBL during medical school show positive effects on physician competency. However, an assessment of the curriculum using the six dimensions of quality identified a quality gap in curriculum integration within Medical Foundations (MF). We aim to increase self-reported student comfort with knowledge/skill assimilation between pre-clerkship curriculum domains by 20% prior to the start of clerkship by providing a PBL interactive exercise at the end of each MF.

Methods: In order to identify an area of quality improvement within McMaster's UGME curriculum, a process map was created. The map outlined the way in which various aspects of the curriculum are learned, tested, and integrated in the pre-clerkship period. Based on this map, areas where integrative exercises could be implemented were identified. Moving forward, a needs assessment survey will be distributed to students which will elicit their self-perceived comfort in integrating information acquired in all domains of the curriculum.

Results: A proposed change that will address the aforementioned quality gap is the implementation of an interactive exercise in a small group session. Students would work together to solve a medical problem that would require them to draw on their scientific knowledge, history taking and physical exam skills, and understanding of medical ethics. Needs assessment surveys will be used to inform in which class this case should be implemented in and how often this exercise should be undertaken.

Conclusions: The proposed interactive exercise will help students become more adept at assimilating information from all aspects of the preclerkship curriculum and apply this information in the clinical setting as clerks.

Steroids In Cardiac Surgery (SIRS) – Wound infection substudy

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Background: Infections following cardiac surgery result in significant morbidity, mortality and healthcare cost. To target populations for prophylactic interventions, clinicians are interested in predictors of post-operative infections.

Methods: Steroids in Cardiac Surgery (SIRS) was a multi-centre randomized controlled trial assessing the intraoperative use of methylprednisone during cardiac surgery. 7507 patients were enrolled in 80 centers and 18 countries. Using the participants as a cohort, we aimed to identify independent risk factors for post-operative wound infections. We excluded those who did not undergo surgery, died intraoperatively or within 48 hours of operation. Patients were identified as having developed "surgical site infection" or not by postoperative day 30. Using hypothesized and known risk factors, we created a binary logistic regression model using a forward step-wise entry model.

Results: Follow-up at 30 days was complete for all patients; 7406 were included in the cohort. Risk factors significant at the $p<0.05$ level include: diabetes managed with insulin (aOR: 1.53, 95%CI:1.12-2.10), oral hypoglycemics (1.58, 1.16-2.13), or diet (1.66, 1.05-2.62), female gender (1.32, 1.04-1.70), renal failure with (2.05, 1.07-3.95), and without (1.52, 1.06-2.17) dialysis, >96 minutes cardiopulmonary bypass (CPB) time (1.86, 1.45-2.38), BMI >30.49 (1.56, 1.22-1.99), peak ICU blood-sugar (mmol/L) (1.02, 1.00-1.04), dual-antiplatelet therapy (1.44, 1.01-2.05), CABG operation type (2.55, 1.84-3.54).

Conclusions: Being at higher risk of surgical site infection, diabetic patients, those requiring longer CPB, with higher BMI or undergoing CABG (likely due to saphenous vein harvest) may benefit from additional prophylactic interventions. Intensive postoperative glucose control may reduce surgical site infections.

Surgical ablation of atrial fibrillation: A systematic review and meta-analysis of randomized controlled trials

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Background: Surgical ablation for atrial fibrillation (AF) improves maintenance of sinus rhythm and is recommended as a concomitant procedure in patients undergoing cardiac surgery. Current trials lack power to assess for patient-important outcomes including mortality, stroke and pacemaker

requirement.

Objective: To assess the effect of concomitant surgical AF ablation on post-operative freedom from AF and patient-important outcomes.

Methods: We searched Cochrane CENTRAL, MEDLINE and EMBASE from inception to May 2016 for RCTs evaluating surgical AF ablation using any lesion set versus no surgical AF ablation in adults with AF undergoing cardiac surgery. We performed screening, full-text assessment, risk-of-bias evaluation and data-collection independently and in duplicate. We evaluated risk-of-bias for individual studies with the modified Cochrane tool, quality of evidence with the GRADE framework and pooled data using a random effects model.

Results: Of 23 included studies, only one was considered at low risk-of-bias. Surgical AF ablation was associated with more freedom from AF at 12 months (RR=2.32, 95%CI[1.92, 2.80], p<0.001, low-quality). However, no difference was seen in mortality (RR=1.07, 95%CI[0.72, 1.52], p=0.41, moderate-quality), stroke (RR=1.19, 95%CI[0.59, 2.39], p=0.63, moderate-quality) or pacemaker implantation (RR=1.28, 95%CI[0.85, 1.95], p=0.24, high-quality). Comparing biatrial and left-sided lesion sets, no difference was seen in mortality (p-interaction =0.60) or stroke (p-interaction=0.12). At 12 months, biatrial procedures led to more freedom from AF (RR=2.80 95%CI[2.13, 3.68], p<0.0001) when compared to left-sided ablation (RR=2.00 95%CI[1.68, 2.39], p<0.0001) (p-interaction=0.04) Biatrial procedures also increased risk for pacemaker (RR=2.68, 95%CI[1.41, 5.11], p=0.002) compared to no ablation while left-sided ablation did not (RR=1.08, 95%CI[0.67, 1.74], p=0.76) (p-interaction=0.03).

Conclusions: Surgical AF ablation during cardiac surgery improved freedom from AF, however, patient-important outcomes including mortality and stroke did not differ. Biatrial when compared to left sided lesion sets showed no difference in mortality or stroke but was associated with significantly increased risk of pacemaker requirement.

Integrating the social determinants of health into the McMaster undergraduate medical clinical skills curriculum: A quality improvement in medical education pilot project

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Background: The importance of social determinants of health (SDoH) is increasingly emphasized in Canadian medical education. However, there is a quality gap regarding the translation of theoretical knowledge of SDoH into clinical practice (Daghofer, 2016). This gap can be defined in terms of effectiveness and efficiency. For instance, there is inadequate opportunity to practice skills for SDoH risk assessment and intervention, and there is often unused time in Clinical Skills sessions. By integrating SDoH skills with knowledge acquisition in pre-clerkship, we aim to improve medical students' clinical skills and comfort with assessing SDoH risk factors by 50% by the end of pre-clerkship.

Methods: We will use quality improvement tools (fishbone diagram and five-why's) to identify a gap in the integration of Professional Competencies in medical education. Collaborating with relevant student groups, we will conduct a needs assessment regarding the integration of SDoH into Clinical Skills sessions to gain insight into potential interventions. We will also conduct a literature review and environmental scan to help guide our intervention. Plan-Do-Study-Act (PDSA) cycles will be conducted to pilot and revise our intervention prior to full implementation. We will administer pre/post surveys and objective assessments (e.g. a station in the mock objective structured clinical exam [mOSCE]) to evaluate changes in knowledge, comfort, competence, and readiness to incorporate SDoH into clinical practice. Statistical analyses will be performed using paired t-tests.

Results: We identified various factors contributing to the quality gap, including limited opportunities to practice SDoH, clinical skills manual not containing SDoH exams, and SDoH training not occurring until clerkship.

Conclusions: Quality patient care requires knowing how to navigate the interaction between social factors and health. Providing undergraduate medical students the opportunity to apply their SDoH knowledge in Clinical Skills could strengthen the application of SDoH in clinical practice.

Using a quality improvement approach to amend the guidelines surrounding the accessibility and availability of scrub sessions for pre-clerkship medical students at McMaster University

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Background: Under the current guidelines, pre-clerkship medical students at McMaster are discouraged from registering in scrub sessions. This has led to inequitable experiences in the operating room (OR) and diminished student and patient safety. Furthermore, students arrange scrub sessions with OR educators individually with varying attendance causing inefficiency.

Methods: Following quality improvement (QI) methodology, a needs assessment survey was administered to first-year medical students in the Hamilton (H), Niagara (N), and Waterloo (W) campuses. It probed their understanding of current guidelines and the resultant quality gap, and assessed the impact of scrub sessions on their OR experiences. Our first Plan-Do-Study-Act (PDSA) cycle will involve designing an online registration platform for five Hamilton tutorial groups. Feedback from PDSA cycles will be used to improve the platform.

Results: The preliminary response rate for the needs assessment survey was 34.0% (70 responses: 57H, 8N, 5W). When asked about current guidelines, only 13 respondents (18.6%) identified them correctly, 8 of whom still completed a scrub session in direct contravention of the guidelines. Unsurprisingly, "unclear guidelines" was indicated as the most challenging aspect about registering for a scrub session (33 of 70). In the Niagara campus, there is a mandatory requirement that students complete a scrub session at the regional campus. Although the sample size is small, 3 of 8N (37.5%) responded that there

was nothing challenging, compared to 5 of 62H,W (8.06%). In other words, the needs assessment survey identified demonstrable confusion and dissatisfaction among pre-clerkship students about current guidelines.

Conclusions: This project aims to increase medical student satisfaction in the accessibility of scrub sessions to 40% by the class of 2022. Our proposed change is to (1) implement an open policy for pre-clerkship students to complete scrub sessions and (2) design an online registration platform for scrub sessions.

Genotype/Phenotype correlations in 103 children from 87 families with hereditary spherocytosis

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Background: Hereditary spherocytosis (HS) is the most common congenital hemolytic anemia in Caucasians. Patients with HS show a high degree of phenotypic variability from asymptomatic to transfusion dependence. Much of this variability stems from HS not being a single uniform disorder but instead being a collection of disorders involving mutations in 5 different genes (ANK1, SPTB, SPTA1, SLC4A1, and EPB42) encoding for the 5 major cytoskeletal proteins in red blood cells (ankyrin, β and α spectrin, band 3, and protein 4.2 respectively). These proteins are responsible for maintaining the biconcave disk morphology of red blood cells. Traditionally the diagnosis of HS has been made without genetic testing. We believe that knowledge of the HS subtype may impact future clinical management decisions, e.g. what type of splenectomy to perform-partial vs total and impact on genetic counseling needs. As a result we are now pursuing genetic testing on all our patients with HS.

Methods: Over the past 16 years at Sick Kids Hospital (Toronto, Canada), we have followed 257 children with HS. In the past year we have also been offering genetic testing (following informed consent) to all children (<18 years old) still being followed in our center. DNA is sent to Prevention Genetics (Wisconsin, USA) where Next Generation sequencing is performed. Mutations are verified by Sanger sequencing.

Results: In total, we have genetic test results on 103 children from 87 families to date. Mutations in ANK1 were most common (50 children/43 families); followed by mutations in SPTB (32 children/26 families); SLC4A1 (7 children/7 families) and finally SPTA1 (6 children/3 families) EPB42 mutations were not found to be causative for HS in our cohort. In 8 children (8 families) no causative mutation for

HS was found. In 23% of children multiple mutations were found –particularly heterozygous mutations of SPTA1 in combination with ANK1 or SPTB mutations. The majority of mutations in our patients were nonsense, frameshift, or splice site mutations. Most were novel – not previously described mutations, and unique to families. There were 5 exceptions to this; 1) c.4339-99C>T in SPTA1 (referred to as the α LEPRA mutation) in 4 children/2 families with an α spectrin form of HS, and in another 2 children (1 family) with an ankyrin form of HS; 2) an ANK1 c.5097-33G>A (8 children/6 families); 3) an ANK1 c.1405-9G>A (4 children/3 families); 4) SPTB c.6037C>T (3 children/2 families); and 5) SPTBc.5266C>T (3 children/2 families). The ANK1 c.5097-33G>A mutation had not been previously identified and yet was the most frequently detected mutation in our HS population. Most children (68/103) were found to have autosomal dominant (AD) HS: 33 children with the ankyrin subtype, 26 with the β spectrin subtype, 4 with the band 3 subtype and 5 in whom no mutation could be found but where there was a clear history of AD inheritance. Autosomal recessive (AR) inheritance was confirmed in 7 children – all 6 with α spectrin form of HS and 1 with a β spectrin form of HS. Twenty-eight children were spontaneous new mutations for HS: ANK (n=17), β spectrin (n=5), band 3 (n=3) and 3 in whom no mutation could be found. In all AR forms of HS, the index case had initially been thought to be a spontaneous new mutation for an AD form of HS; genetic testing resolved the inheritance pattern. Patients were categorized according to disease severity, primarily on the basis of their need for transfusions (a reflection of baseline hemoglobin) and splenectomy. The proportion of children that have required transfusions and needed splenectomies was: 83%/83% (α spectrin); 48%/18% (ankyrin), 23%/10% (β spectrin) and 29%/0% (band 3). Most children in our center undergoing splenectomy have undergone partial splenectomy; few have required subsequent total splenectomy. However, of the 5/6 children with α spectrin form of HS that underwent partial splenectomy 3 have subsequently needed, or are being considered for, total splenectomy. This suggests that due to the extreme severity of the α spectrin subtype of HS, children with this form of HS may not do well long-term with partial splenectomy and are likely to eventually require a total splenectomy.

Conclusions: Our study to date represents one of the largest and most comprehensive genetic analyses of a cohort of HS patients. Our findings will add to the growing understanding of the disease, and will be important to provide comprehensive genetic counseling and possibly in the future to guide management of selected cases.

Design and implementation of inclusive sexual history taking education: a quality improvement in medical education pilot project

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Background: Inconsistent exposure to sexual history taking between clinical skills groups is a current quality gap in pre-clerkship education. Students are not exposed to extensive sexual history taking in a timely manner, as their main exposure is often not until clerkship. Most pre-clerkship education and exposure is minimal, and not effective in increasing student comfort with regards to sexual history taking. Additionally, this exposure is not equitable as it varies greatly between clinical skill groups, and

is largely based on the comfort level of the different preceptors. Many students are sent into clerkship feeling unprepared and uncomfortable with regards to sexual history taking, which enhances their anxiety, and is thus not student-centered. This anxiety can also result in an unsafe environment for both medical learner and patient.

Methods: To better understand the contributing factors to the perceived gap in inclusive sexual history taking, we used the 5-why's as a root cause analysis. Using a needs assessment, we will present preliminary findings of medical students sexual history taking comfort levels in the current curriculum. This assessment helps us better understand our quality gap and gauge student interest in future resources. Using multiple plan-do-study-act (PDSA) cycles and quality improvement methodology, we will implement an online resource for inclusive sexual history taking at the Niagara Regional Campus. Ongoing feedback will be used during implementation across campuses.

Results: The study is still in progress. Using pre and post intervention surveys, we will assess any changes in student comfort level with inclusive sexual history taking.

Conclusions: Early exposure and consistent practice of inclusive sexual history taking will both help students feel more comfortable utilizing these skills in a clinical setting, and will help them to provide improved patient-centered care.

Methodology Framework using Open Source Model for Screening Grey >>and Peer Reviewed Literature for Public Health Systematic Review

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Background: Systematic reviews are recognized as the highest level of evidence in health assessment yet their undertaking is often hampered by methodologic challenges including extensive yield, management, sifting and assessment strategies. Despite technological advances and willingness for international collaboration, challenges remain in how to operationalize coordinated efforts. The objective of this study is to outline an open source methodology to conduct a systematic review.

Methods and Results: Fourteen electronic sources including grey public health databases (e.g. Canadian Public Policy website) were searched between 1980-2016. The literature was collected by six international researchers and uploaded into open source reference manager, Zotero, which allows multiple users to manage bibliographic data. The initial search yielded N=52,786 which was converted to an XML file and exported into R (R-project.org) and JMP Pro 12.0 (Cary, NC, USA) to effectively remove duplicates. 31,446 entries were exported into Microsoft Excel where four raters individually assessed 8,255 titles. To ensure screening conformity, raters were paired to overlap 5% (N=1572). Inter-rater reliability between raters ranged kappa= 0.75, 0.96 and 0.98, with overall kappa=0.95. Articles were reduced 72% (N=8690), by removing duplicates (4 %) and articles not related to objectives

(69 %). A revised spreadsheet was re-uploaded into Zotero where full articles were accessed for further data extraction.

Conclusions: Optimizing open source technology is easily accessible, can be used to synthesize large amounts of data which facilitates multi-institutional coordination efforts, ultimately making the undertaking of systematic reviews more manageable.

Helping introverts integrate into group-based learning: a quality improvement in medical education pilot project

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Background: McMaster University's medical school curriculum pioneered the usage of Problem-Based Learning (PBL) in small group settings. PBL relies on active participation by learners. As such, individuals with introverted personalities may find it difficult to engage in the PBL process. Haight et al. reported that pressure on introverted learners to be constantly outspoken can be damaging to learners' psychological health. Furthermore, Davidson et al. noted that introverted students who are unable to speak up in tutorials fail to demonstrate their learning. Current small group practices are not respectful of students' preferences to observe before responding and evaluations appear to favour extraversion. Thus, there exists a quality gap where introverted learners are ineffectively integrated into the curriculum. Our goal is to improve introverted students' feelings of preparedness at the beginning of medical school by 25% and improve feeling of adequate participation in tutorial by 50% at the end of Medical Foundation 1.

Methods: A needs assessment survey will be conducted to identify the impact of introversion on learner participation and comfort with PBL. In addition, a fishbone diagram will be created and both survey and diagram will identify possible areas to be targeted by an intervention. Plan-Do-Study-Act cycles will then be used to refine the intervention before widespread implementation throughout all McMaster campuses.

Results: Using the methods outlined above, an intervention will be designed to better integrate introverts in a tutorial setting. Though our intervention will specifically involve McMaster University, the intervention can be adapted for any medical school using PBL, thus helping to better integrate all student personalities into their curriculum.

Conclusions: Our study aims to better integrate introverted learner into the medical school curriculum and we anticipate that our intervention will improve students' feelings of preparedness and participation.

A case of left hemiplegia, spatial neglect and anosognosia: a classic neurological syndrome

revisited.

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Background: This case report describes an 85 year old right handed man presenting with a large right MCA stroke. This resulted in dense left sided hemiplegia, hemineglect and anosognosia. Anosognosia is the denial of hemiplegia and functional impairment that can affect those with spatial neglect. Left spatial neglect has been found in two thirds of right hemisphere strokes typically involving the MCA territory at the temporoparietal junction,[1] although frontal and subcortical areas have also been implicated.[2] Right MCA strokes may also result in left visual field hemianopia, which can be confused for neglect. However they can be clinically distinguished as those with pure neglect tend to deviate their head and eyes to the right, whereas those with pure hemianopia will scan the visual field to compensate for their deficit.[3]

Assessment: Simple bedside tests useful in detecting hemineglect including clock drawing, figure copying, line bisection and stimulus cancellation (Bells) tests, with sensitivities ranging from 27% (clock drawing test) to 52% (Bells test). A combination of these tests can detect up to 85% of cases of neglect .[4] The Bisiach Anosognosia Scale grades the severity of denial on a scale of 0-3. Those with mild anosognosia can recognize their deficits if their attention is drawn to the fact (score of 1-2), whereas others will never do so (score of 3). [5]

Rehabilitation and treatment: Rehabilitation of hemineglect includes bottom-up methods that passively draw attention to the neglected side through limb immobilization, prism adaptation of visual field, right-hemifield eye patching and contralateral vestibular system stimulation. Top-down techniques are also used, using behavioural modification such as visual field scanning. The presence of anosognosia is associated with poor prognosis for rehabilitation. Techniques that have been moderately effective in improving anososgnosia include education and feedback (video feedback of patient as they complete tasks) to increase understanding of their functional deficits. [6]

How does fluoxetine reinstate critical period plasticity?

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Background: Fluoxetine reinstates critical period-like plasticity and promotes total recovery of visual acuity in adult animals. Translating these results from animal models to clinical therapies has been challenging because of the lack of mechanistic understanding. For example, shifts in the physiological excitatory/inhibitory (E/I) balance are necessary to open and maintain the critical period, but fluoxetine's impact on the E/I balance remains unclear

Methods: Here, we studied the effect of fluoxetine treatment in adult rats, alone or in combination with visual deprivation (monocular deprivation, MD), on a set of highly conserved pre- and post-synaptic proteins (Synapsin, Synaptophysin, PSD-95, Gephyrin). Synapsin and Synaptophysin contribute to exo- and endo-cytosis of neurotransmitter vesicles, respectively, and support normal patterns of neural firing by affecting neurotransmitter release. The glutamatergic and GABAergic receptor scaffolding proteins, PSD-95 and Gephyrin respectively, interact to regulate the number of excitatory and inhibitory synapses thereby affecting the physiological E/I balance. To test if the effects of fluoxetine and MD were global or localized to the primary visual cortex (V1), we compared the frontal cortex, somatosensory cortex, and V1, contralateral and ipsilateral to the deprived eye.

Results: We found that MD caused an overall loss of synaptic proteins and a shift in favor of PSD-95. Surprisingly, fluoxetine alone had no impact on protein expression, but when it was combined with MD it prevented the MD-induced changes. Furthermore, we found that these effects were restricted to the contralateral V1.

Conclusions: Our results support two conclusions. First, MD causes a homeostatic shift towards greater excitation in the cortical area that lost the greatest amount of neural activity. Second, despite reported changes in gene expression, fluoxetine alone does not change protein expression. Rather, fluoxetine's latent effects are only revealed when it is combined with a strong manipulation of neural activity.

Utilization of a quality improvement approach to enhance pre-clerkship electives at McMaster University

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Background: McMaster Medical School Pre-clerkship electives are an opportunity for students to be exposed to various medical specialties. In preparation for booking electives students receive information from multiple formal and informal sources which adds to confusion and anxiety during a time when decision making is critical. The limited information reduces timeliness, effectiveness, and efficiency as students spend time finding their own resources or making requests for programs that do not accept pre-clerks. The process is not student centered: the lack of clarity increases students' anxiety levels and forces them to accept non-preferable electives in order to fulfil the program requirements. There needs to be a more equitable means of informing students that ensures all students have sufficient resources. The aim of this project is to provide a resource document that improves student satisfaction with the pre-clerkship elective selection process by 50% and reduces the number of requests submitted by 20% by July 2018.

Methods: Quality improvement methods and tools were used to identify a quality gap within the pre-clerkship electives booking process. We used a fishbone diagram as a root cause analysis to understand the contributing factors to the perceived gap in information dissemination.

Results: We will present preliminary findings from our needs assessment of medical students to better

understand our quality gap and gain insight into potential interventions for pilot testing. The PDSA framework will be used in which surveys will be conducted after each cycle to assess student satisfaction and improve the document.

Conclusions: A student manual would provide a concrete resource for students, decreasing anxiety surrounding the elective booking process, decreasing the number of rejected requests and the amount of requests received by administrative staff. This project was completed during pre-clerkship as part of the Program for Improvement in Medical Education (PRIME).

Using a quality improvement approach to enhance the integration of professional competencies and tutorials in the McMaster medical school curriculum

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Background: Within the pre-clerkship curriculum, there is inconsistent integration of social determinants of health (SDOH) discussed in professional competencies (PC) into tutorial cases. This issue affects various domains of quality. Students who cannot appreciate the social situation of their patients present a risk to patient safety and comfort. Integrating PC concepts into tutorial helps consolidate information from multiple components of the program in a timely and relevant manner. This would lead to more effective education and increased student confidence in engaging patients in an equitable and holistic way. This project aims to have 100% of pre-clerks discuss one relevant social aspect of every tutorial case and indicate an overall increased level of self-reported comfort with SDOH.

Methods: A process map was used as a QI framework to delineate the factors contributing to the quality gap in PC and tutorial integration. We will conduct a needs assessment survey of our class to gauge interest in integrating SDOH topics in tutorial. These findings will inform any potential interventions that will be initiated. Plan-Do-Study-Act cycles will help pilot our chosen intervention with 1-2 tutorial groups to evaluate its effectiveness before large-scale implementation.

Results: The outcomes we wish to affect are frequency of discussion and student comfort surrounding social aspects of tutorial cases. As it dictates mandatory tutorial topics, adding socially-focused objectives into the tutor guide will provide a more structured platform to explore SDOH. Constraints that must be balanced are time for creating these objectives, tutor training, and tutorial time. Pre- and post-intervention surveys will assess changes in outcomes and receive feedback on the implementation of this intervention.

Conclusions: By making SDOH a mandatory component of tutorials, we hope to integrate the various components of the curriculum to enhance the knowledge and skills of medical students, allowing them to approach patients holistically.

Surgical Management of Deep Gluteal Syndrome: A Systematic Review

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Background: The purpose of this systematic review was to assess the etiologies, surgical indications, patient-reported clinical outcomes, and complications in patients with deep gluteal syndrome.

Methods: Three databases: PubMed, Ovid (MEDLINE), and EMBASE, were used by two reviewers independently from database inceptions until September 7, 2016 to search for all studies reporting surgical management of deep gluteal syndrome. Inclusion criteria were English language studies, studies on humans of all ages, studies with reported clinical outcomes, and those with levels of evidence I to IV. Systematic reviews, conference abstracts, book chapters, and technical reports with no outcome data were excluded.

Results: The search identified 1,539 studies, of which 28 (481 patients) were included for assessment. The most commonly identified etiologies were iatrogenic (30%), piriformis syndrome (26%), trauma (15%), non-piriformis (hamstring, obturator internus) muscle pathology, (14%), and skeletal injury/entrapment (7%). The decision to pursue surgical management was made based on clinical findings and diagnostic investigations alone in 50% of studies whereas surgical release was attempted only after failed conservative management in the other 50%. Outcomes were generally encouraging with an improvement in symptoms at final follow-up reported in all 28 studies. The incidence of complications from these procedures were low with <1% and 8% of open surgeries, and 0% and <1% of endoscopic procedures resulting in major and minor complications respectively.

Conclusions: Although most of the studies identified were case series and reports, the results consistently show improvement in pain and low incidence of complications, particularly for endoscopic procedures. These findings lend credence to surgical management as a viable option for buttock pain caused by deep gluteal syndrome and warrants further investigation.

Using MacAnatomy as a tool to enhance student learning of pathology: a qualitative analysis

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Background: MacAnatomy has been successfully used as an online portal for the Education Program in Anatomy at McMaster University. The utility of this resource is now being explored as a method to enhance students' learning of pathology through the use of an online specimen database. The focus of this analysis was to evaluate the perceived usefulness of MacAnatomy as a platform for this area of learning and to obtain feedback that will be used to develop a new pathology learning tool.

Methods: Data was collected from interviewees (n=24) spanning various programs at McMaster including, Bachelor of Health Sciences, Undergraduate Medicine, Midwifery, and Biomedical Engineering who had participated in the anatomy curriculum. Transcripts were analyzed by five independent assessors based on a predetermined protocol.

Results: Six main themes emerged related to design and layout, user interface, learning approach, assessment, multimedia, and maintenance. These themes explored concepts such as the visual appeal and organization of the online content, the user-friendliness of the tool, the relevance of specimens to various case studies, and clinical backgrounds and diagnostic imaging. Students placed an emphasis on learning pathogenesis and pathophysiology and better integration of learning objectives and different resources within their courses.

Conclusions: Students appreciate the accessibility and utility of an online learning tool for pathology, with more emphasis being placed on a good user interface and the relatability of the content to each student's curriculum. This thematic analysis has allowed for the development of two learning tools, one that presents information in the form of a self-testing game, and another that focuses on comparing normal and pathological specimens and providing more contextual information on their pathogenesis and clinical presentation. Next steps for this research project include the complete development of these learning tool prototypes and the evaluation of their efficacy.

Easing the transition to medical school for students without a working knowledge of basic biological sciences: a quality improvement in medical education pilot project

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Background: The Michael G. DeGroote School of Medicine's acceptance of students from diverse educational backgrounds is a hallmark of its innovative approach to medical education. However, the transition to the medical curriculum has anecdotally been challenging for many without a working knowledge of basic biological sciences, leading to a unique quality gap for these students. First, it is inequitable, as it disadvantages a specific group of students. It also reduces the efficient learning of curriculum content, as student spend scarce time identifying and filling knowledge gaps. They may be subjected to additional anxiety during this already challenging transition, compromising psychological safety.

Methods: After utilizing a quality improvement approach to identify and define a quality gap in

medical education at McMaster, we used a fishbone diagram to understand the complex systemic factors contributing to this gap, and an environmental scan to assess how other medical schools approach this issue. We will use the results of a needs assessment to inform the design of our pilot intervention. We will use Plan-Do-Study-Act (PDSA) cycles to pilot test, spread and scale our intervention.

Results: The development and implementation of a medical school transition program, with the aim of equipping students with the knowledge, resources, and mentorship to feel confident as they begin their first MF, has been identified as a testable solution to this quality gap. The program will facilitate the learning of basic, high-yield scientific concepts in a learning space that will simulate the problem based learning tutorial environment. Confidence in material will be measured with pre/post-intervention surveys following spread and scale of the program.

Conclusions: Students without an educational background in the biological sciences experience additional stresses while transitioning to medical school. Our proposed change would promote confidence and reduce stress associated with the transition to medical school for non-traditional students.

An Assessment of Surgical Specialty Candidate Readiness for the Canadian Resident Matching Service (CaRMS) Application

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Background: The Canadian Resident Matching Service (CaRMS) process has become increasingly competitive in recent decades, and there is limited literature on preparative resources. This study aims to identify available resources and assess the efficacy of two workshops in improving student readiness for the CaRMS application and interview, focusing on surgical specialties.

Methods: Two workshops were developed for McMaster University medical students. The first targeted the written application, with advice offered by program directors (PDs) from four surgical specialties; the second targeted residency interviews, with advice offered by surgical residents. Pre- and post- surveys were conducted at the first, and a post-survey at the second, to assess the perception of available resources, student preparedness, and the benefits of these workshops. Student demographics and survey responses were analyzed.

Results: 35 students attended one of two workshops, of which 9% were first-year, 76% second-year, and 37% third-year medical students. 34% listed general surgery as their primary specialty of interest, 23% urology, and the remainder listed other surgical specialties. Only 13% of students believed that existing resources offered by the medical school were sufficient. Students identified the following resources offered by McMaster: career counsellors, talks and drop-in sessions, CV editing, the Surgery Interest Group, and online resources. 93% of attendees reported that they would find an information session from PDs beneficial for completing the CaRMS application, and one-on-one MMI-style interview

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practice beneficial for residency interviews. Post- workshops most students agreed that the information provided by the PDs and surgical residents was indeed beneficial (97% and 83% respectively), and that the workshops should be held annually.

Conclusions: Our study contributes to the limited literature on student resources for the CaRMS application and interview preparation. Adjunct resources including workshops with guidance from PDs and surgical residents are necessary to better prepare students for the competitive surgical residency match.

An audit of pain, agitation, and delirium (PAD) management in the Niagara Health (NH) St. Catharines Site (SCS) intensive care unit (ICU)

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Background: In 2013, the American College of Critical Care Medicine published updated guidelines on ICU PAD management.1 They strongly recommended routine assessment of PAD using validated tools and the prevention/ treatment of these modalities. The implementation of PAD guidelines in academic hospitals has been shown to improve patient outcomes by decreasing length of hospital stay, duration of mechanical ventilation, mortality, long-term complications, and cost.2,3,4,5,6 However, the uptake of the guidelines in community hospitals is unclear; therefore, this project aims to review current management practices and to design interventions to improve PAD management.

Methods: All patients admitted to NH SCS ICU for >24 hours were included in this audit. Demographic data, clinical information, process of care data and medication information was collected daily for 20 weeks. Weekly aggregate data was converted into an Excel run chart. Process measures included PAD assessment using the numeric pain scale/Richmond Agitation-Sedation Scale (RASS)/Confusion Assessment Method for the Intensive Care Unit (CAM-ICU), benzodiazepine use, and physical restraint use. Outcome measures included rate of pain, over-sedation, and delirium. The balancing measure was self extubation.

Results: There was no difference in baseline data between day and night shifts. The pain, RASS, and CAM-ICU assessment, was done for a median of 53/100 patients, 73/100 patients, and of 24/100 patients, respectively. A RASS score less than -1 was given to 36/100. The use of medications is wide-spread, especially the use of narcotics (antipsychotics, benzodiazepines, and narcotics were used use for a median of 29/100 patients, 24/100 patients, 69/100 patients, respectively). Furthermore, physical restraints were applied to a median of 38/100 patients.

Conclusions: Our audit data suggests a care gap that could be targeted using a multifaceted and multidisciplinary intervention with the aims to increase the uptake of PAD guidelines and to decrease

delirium rate in the ICU.

Engaging nurses in developing a multifaceted and multidisciplinary approach on pain, agitation, and delirium (PAD) management in the Niagara Health (NH) St. Catharines Site (SCS) intensive care unit (ICU)

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Background: Critically ill ventilated patients have a high prevalence of delirium and they often experience pain and agitation during their stay in the Intensive Care Unit (ICU). Sedation and analgesics are used[1] but are associated with the development of delirium and adverse outcomes such as prolonged hospital stay[2], and increased mortality[3,4,5,6,7]. The implementation of PAD guidelines in academic hospitals has been shown to improve clinical outcomes[8,9]. More importantly, nurses are fundamental to patient care[10,11] and multidisciplinary strategies should be developed to effectively assess, prevent, and manage PAD.

Methods: A qualitative study of focus group sessions with nurses from a site-specific ICU was used to explore important themes and understand ways to engage nurses in quality improvement (QI) in the ICU. Discussions were facilitated with a pre-set of questions that explored nurses' perceptions of ideal and problematic ICU patients, sedation management, contributors of delirium, and challenges to management. After completion of these sessions, all data was merged and analyzed to identify common themes.

Results: Nurses reported that a preferred management algorithm would involve minimal sedation as that would allow PAD clinical tools to be used effectively. Common themes that arose during the focus group sessions included reducing environmental stressors, increasing communication between physicians and nurses, and providing educational resources for nurses in order to better understand the rationale behind patient PAD assessment and management.

Conclusions: The focus group sessions allowed nurses to express concerns regarding over-sedation, iatrogenic stressors, and lack of consistency among healthcare professionals. This feedback shed insight onto steps that can be taken to improve PAD management in the ICU.

Afternoon Poster Presentations

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Afternoon Poster Presentations – Abstracts

Evaluating the effectiveness of the digital rectal exam in prostate cancer screening in the primary care setting: A systematic review and meta-analysis

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Background: The digital rectal exam (DRE) is commonly used to screen for prostate cancer in both the primary care and specialty (primarily urology) settings. Although the DRE is recommended as a screening tool for prostate cancer by numerous guidelines, it is neither a sensitive nor specific exam, with limited data to support its routine use in primary care. We evaluated the diagnostic accuracy of the DRE in screening for prostate cancer in primary care.

Methods: MEDLINE, Embase, DARE, CENTRAL, Cochrane Database of Systematic Reviews, and CINAHL were searched from their inception to June 2016. Six reviewers, in pairs, independently screened citations for eligibility and extracted data. QUADAS-2 was used to assess quality of included studies. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of the DRE in primary care settings were meta-analyzed.

Results: Our search yielded a total of 8,217 studies, only seven of which were included after the screening process. Four employed a retrospective study design, and three were conducted prospectively. Six studies provided adequate data to calculate sensitivity and PPV of the DRE, whereas four allowed for calculation of specificity and NPV. Pooled sensitivity of the DRE among primary care physicians was 0.51 (95% confidence interval [CI] 0.36-0.67; I2 = 98.4%) and pooled specificity was 0.59 (95% CI 041-0.76; I2 = 99.4%). Pooled positive predictive value was 0.41 (95% CI 0.31-0.52; I2 = 97.2%), and pooled negative predictive value was 0.64 (95% CI 0.58-0.70; I2 = 95.0%). Substantial between-study heterogeneity was evident for all pooled estimates.

Conclusions: This analysis supports previous studies that have shown overall low diagnostic accuracy of the DRE and demonstrates that this exam may have limited clinical utility in the primary care setting.

A Historical Analysis of Randomized Controlled Trials in Anterior Cruciate Ligament Surgery

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Background: The purpose of this systematic review was to comprehensively assess the quality of reporting of randomized controlled trials (RCTs) relating to anterior cruciate ligament (ACL) reconstruction. Specifically, this review explored factors related to the quality of the RCTs and trends in the quality of reporting over time.

Methods: The online databases PubMed, Ovid (MEDLINE), and EMBASE were used to search for all RCTs on the topic of ACL reconstruction from 1985 until April 14, 2016. Quality of reporting was evaluated using the Detsky quality index and the Consolidated Standards of Reporting Trials (CONSORT) checklist for reporting trials of nonpharmacologic treatments. A multivariate regression analysis was used to assess predictors of quality reporting.

Results: The online search yielded 2,933 articles, of which 412 met the inclusion criteria and were assessed for quality of reporting. There was a significant (p<0.0001) increase in the number of RCTs published over time. The mean (standard deviation) Detsky score across all included RCTs was 68.9% (13.2%). The strongest predictors of quality reporting were the inclusion of a CONSORT flow diagram (β-coefficient: 10.0, 95% confidence interval (CI): 8.45 to 11.61, p < 0.0001) and being published in the year 2009 or later (β-coefficient: 5.2, 95% CI: 3.87 to 6.45, p < 0.0001). The factors demonstrating the greatest improvement over time were the inclusion of a full description of the randomization procedure (p=0.001) and prospective calculation of the sample size (p=0.002).

Conclusions: There has been a significant increase in both the quantity and quality of RCTs relating to ACL reconstruction over time. Specifically, the reporting of a methodologically sound randomization process, and prospective calculation of sample size have significantly improved in recent years. However, since the year 2009, the number of trials and reporting in these trials have remained relatively consistent. The use of a CONSORT flow diagram is a strong predictor of high quality reporting.

Using a quality improvement approach to increase diversity and accessibility of HEIGHTEN at McMaster Medical School

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Background: Interprofessional Education (IPE) at Michael G. DeGroote School of Medicine allows students to develop essential interdisciplinary skills. HEIGHTEN (Horizontal Elective for Interprofessional Growth and Healthcare Team Enhancement) was started in 2016 at Niagara Regional Campus (NRC) to fill a gap in experiential learning in the IPE curriculum. HEIGHTEN has been successful, but has a quality gap that spans two dimensions: equitability and effectiveness. The current program is not equitable, as it is only available at NRC. Additionally, HEIGHTEN would be more effective if there were diverse healthcare professionals available for shadowing. We have two aims

regarding improving and expanding the HEIGHTEN program. Firstly, we aim to make HEIGHTEN equitable for 100% of McMaster Medicine students by implementing HEIGHTEN at Hamilton and Waterloo campuses. Secondly, we aim to make HEIGHTEN more effective in achieving the goals of IPE by expanding the number of allied healthcare professions available to shadow.

Methods: A preliminary literature review of IPE was conducted. A process map was used to highlight areas of improvement in the HEIGHTEN program. A needs assessment of current McMaster medical students will be conducted to quantify the suggested quality gaps. Multiple PDSA cycles will be used to implement and adjust the expanded HEIGHTEN program at all campuses before implementation on a larger scale.

Results: We have identified that there is a quality gap in the equitable and effective administration of the HEIGHTEN program. The findings from our needs assessment survey will quantify this gap.

Conclusions: We propose that HEIGHTEN be implemented at all three campuses and more allied healthcare professions be incorporated. By addressing these gaps, more students will have the opportunity to develop their interprofessional skills in a meaningful way.

Adherence to Standards for Reporting Diagnostic Accuracy in Emergency Medicine Research

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Background: Diagnostic tests are used frequently in the emergency department (ED) to guide clinical decision-making and, hence, influence clinical outcome. The Standards for Reporting of Diagnostic Accuracy (STARD) criteria were developed to ensure diagnostic test studies are performed and reported to best inform clinical decision making in the ED.

Objective: To determine the extent to which diagnostic studies published in emergency medicine journals adhered to STARD 2003 criteria.

Methods: Diagnostic studies published in 8 MEDLINE-listed, peer-reviewed, emergency medicine journals over a 5-year period were reviewed for compliance to STARD criteria. Results: 12649 articles were screened and 114 studies were included in our study. 20% of these were randomly selected for assessment using STARD 2003 criteria. Compliance to criteria ranged from 4.35% adherence (criteria: reporting adverse events from performing index test or reference standard) to 100% (multiple criteria).

Conclusions: Just over half of STARD criteria are reported in more than 80% studies. As poorly reported studies may negatively impact clinical outcomes, it is essential that studies of diagnostic test accuracy be performed and reported adequately. Future studies should assess whether studies have

improved compliance with the STARD 2015 criteria amendment.

Using a quality improvement approach to enhance diversity exposure at McMaster University through implementation of minority-group standardized patients in clinical skills education.

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Background: The population of visible minority groups will approximate 29% to 32% of the Canadian population by 2031 (1). However, when matched for confounders, minority patients received fewer recommendations for management of diseases such as AIDS, cancer, and heart disease (2). Cultural diversity in patients poses specific health challenges and it has been shown that cultural competency training in medical education improves patient care and clinical outcomes (3,4).

Cultural diversity in the standardized patient (SP) population has been observed as a quality gap in medical education. This project aims to use minority-group SPs to provide safe and effective learning opportunities prior to clerkship. Therefore, the objective of this project is to improve comfort levels amongst medical students in providing care for diverse groups by 25% before clerkship.

Methods: A needs assessment will be performed to measure student exposure and comfort with minority groups in order to develop potential interventions for pilot testing. A root-cause analysis will be performed using an Ishikawa diagram to identify factors contributing to cultural diversity in education. Additionally, a process map will be used to determine current SP recruitment and hiring strategies. A quality improvement intervention will be implemented in multiple Plan-Do-Study-Act (PDSA) cycles at a local level prior to implementation across campuses.

Results: Baseline data will be used to design an intervention that will be piloted using 1:1:1 methodology at a local level. Currently, 6.3% of SPs at the Waterloo Regional Campus belong to visible minorities. The project will be followed using balancing measures (student and SP satisfaction), outcome measures (student exposure and comfort levels), and process measures (SP recruitment).

Conclusions: Disparities between student comfort and exposure with minority groups will demonstrate a need for cultural diversity in education. The implications of the proposed change will provide concurrent exposure to minority groups during medical education.

Program for the Advancement of Clinical Epidemiology (PACE): a quality improvement initiative

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Background: Clinical epidemiology (CE) is a critical component of evidence-based medicine and a strong grasp of its tenets aids in guiding best practices to ensure patient safety and positive health outcomes. The MD program primarily utilizes online CE modules to facilitate student learnings. These modules are underutilized by students due to unclear expectations and lack of perceived content relevance. The CE curriculum also lacks sufficient integration with the general curriculum leading to sub-optimal learning, retention, and application of CE concepts. Program for the Advancement of Clinical Epidemiology (PACE) aims to increase student confidence in clinical epidemiology by 30% by the end of MF4

Methods: PACE proposes developing problem sets and related local objectives that prompt in-depth discussion about high yield clinical epidemiology concepts. By doing this, students and tutors will be made aware of expectations regarding content requirements and its importance. We will begin a small scale trial with three Hamilton tutorial groups and ten control tutorial groups which will not receive the intervention. Before this intervention, we will administer a needs assessment to better understand student attitudes towards CE curriculum.

Results: The intervention and control groups will respond to a series of questions assessing their confidence within multiple CE domains on a 7 point likert scale. We expect greater improvements of confidence in the intervention group compared to the control group. If deemed necessary through feedback between Plan-Do-Study-Act cycles, more focus on CE topics can be emphasized through global objectives, provision of resources, and tutor guide supplementation.

Conclusions: PACE proposes a greater focus on objective setting and discussion on important CE concepts to address a quality gap in the current curriculum. PACE offers a prudent addition to the existing CE curriculum that will allow students to develop appropriate foundational knowledge prior to clerkship.

Body mass index is not associated with the risk of liver biopsy-related complications in children

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Background: The effect of body habitus on post liver biopsy complication risk is unclear. We hypothesized that liver biopsy-related complications are more common in children with higher BMI, and that the risk is higher for confirming the diagnosis of non-alcoholic fatty liver disease (NAFLD).

Methods: This retrospective, single-center study reviewed medical records of all children, ages 2-19 years, who had image-guided, percutaneous liver biopsies at the Hospital for Sick Children. Data extracted included demographics, anthropometrics, biopsy indication, needle size, number of passes,

and laboratory values (hemoglobin, platelets, and INR) pre- and post-biopsy. Complications were classified using the Society of Interventional Radiology system. Univariable and multivariable logistic regression was used to determine association between complications and covariates of interest.

Results: Seven hundred patients (53% male, median age 12 [IQR 7-15] years) were reviewed. The most common indication for liver biopsy was abnormal liver chemistry (42%), with 5% of biopsies confirming a NAFLD diagnosis. There were 44 minor complications (6%): pain (n=37), cutaneous hematoma (n=3, 1 of which developed after 24 hours), fever (n=3), vomiting (n=2), and 5 major complications in 5 different patients (prevalence 0.4%): bleed requiring blood products (n=1), sepsis (n=2), hospitalization (n=2). Two of the 3 patients who had bleeding complications post biopsy had normal platelets (>150 x109/L) and INR (≤1.1) prior to the procedure; the third patient was in acute liver failure at the time of biopsy (INR 1.8, PLT 152 x109/L). Significant predictors of post-biopsy complications on univariable analysis included lower height and weight z-scores. After controlling for confounders, such as age, BMI z-score, and needle gauge, a diagnosis of NAFLD was associated with a 3-fold decreased odds of complications (OR=0.23, p=0.05).

Conclusions: BMI z-score is not associated with increased risk of complications from liver biopsy, while a NAFLD diagnosis is associated with decreased risk of complications.

Arthroscopic management of suprascapular neuropathy of the shoulder: a systematic review

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Background: The purpose of this study was to systematically assess the arthroscopic management of suprascapular neuropathy, including the etiology, surgical decision-making, clinical outcomes, and complications associated with the procedure.

Methods: Three databases, namely PubMed, Ovid (Medline), and EMBASE, were searched on February 17th, 2017. Systematic literature screening and data abstraction was performed in duplicate to present a review of studies reporting on arthroscopic management of suprascapular neuropathy.

Results: In total, 40 studies (17 case reports, 20 case series, 2 retrospective comparative studies, and 1 prospective comparative study) were identified, including 259 patients (261 shoulders) treated arthroscopically for suprascapular neuropathy. The etiologies of suprascapular neuropathy included suprascapular nerve compression by a cyst at the spinoglenoid notch (42%) or suprascapular notch (4%); the transverse scapular ligament at the suprascapular notch (21%); a massive rotator cuff tear (19%); the spinoglenoid ligament at the spinoglenoid notch (6%); a bony, stenotic suprascapular foramen (1%); branches of the suprascapular artery (1%); and an intraosseous glenoid cyst (1%). In 45% of studies, arthroscopic surgery was pursued after failed non-operative management, while in 47% of

studies, surgical decision-making was based on clinical findings and investigations only, and in 8% of studies, arthroscopy was pursued after failed ultrasound-guided needle aspiration of cysts. Overall, 97% of patients reported significant improvement in or complete resolution of their pre-operative symptoms (including pain, strength and subjective function of the shoulder) over a mean follow-up period of 23.7 months. Further, there was a low overall complication rate (4%) associated with the arthroscopic procedures.

Conclusions: While most studies evaluating arthroscopic management of suprascapular neuropathy are case reports and series', results indicate that such management provides patients with significant improvements in pain, strength, and subjective function of the shoulder, and has a low incidence of complications.

Implementation of optional post-tutorial self-assessment quizzes to highlight knowledge gaps and enhance self-directed learning: a quality improvement in medical education pilot project

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Background: Despite its benefits, small-group Problem-Based Learning can result in a lack of student confidence in material covered as well as inconsistency between tutorial groups. Current assessment tools such as the Concept Application Exercises are limited in scope and administered infrequently, and thus may not be the most effective and timely method to identify these inconsistencies. Recognizing learning gaps in a timely manner is vital in student-centred medical education as it facilitates efficient independent learning. The aim of this quality improvement pilot project is to achieve a 25% improvement in student satisfaction over one MF with the effectiveness of program-provided assessment tools in helping them identify and diminish learning gaps.

Methods: To better understand factors contributing to the perceived gap in students' learning of tutorial material, we employed fishbone diagrams. Our proposed intervention involves implementing optional online self-assessment quizzes after each tutorial with immediate feedback. We have disseminated a needs assessment to students to better understand our quality gap and gauge response to our intervention for pilot testing, and will present preliminary findings. A quality improvement methodology will be applied to implement the intervention at a local level. Multiple Plan-Do-Study-Act (PDSA) cycles will be used in conjunction with ongoing feedback to modify the intervention before widespread implementation across campuses.

Results: Student satisfaction will be measured before and after implementation of the pilot to assess the efficacy of this proposed curricular addition. We anticipate that use of this tool will enhance student confidence in effective and equitable knowledge acquisition between tutorial groups.

Conclusions: Our proposed intervention seeks to equip students with a resource that can be used at their discretion to enhance self-directed learning by promptly identifying gaps in understanding and

providing an opportunity to reinforce knowledge.

Complication and reoperation rates of pedicled gracilis flap and vertical rectus abdominis myocutaneous flap for the reconstruction of perineal defects

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Background: The anatomy of the perineum, as well as patient and disease factors from underlying malignancy, make for a hostile environment for wound healing of reconstructed perineal defects following abdominoperineal resection (APR). Previous studies have compared the vertical rectus abdominal myocutaneous (VRAM) flap to the gracilis flap with conflicting results. Our primary research question is to determine the rate of reoperation, requiring an alternate flap, following perineal reconstruction with VRAM versus gracilis flap.

Methods: A retrospective chart review was performed on patients who underwent gracilis (n=14) or VRAM flaps (n=31) for perineal reconstruction following APR for genitourinary or colorectal cancer. Operative data from two surgeons at Hamilton Health Sciences from 2000 until present was collected. Patient demographics, indications for operative management, comorbidities, complications, and type of reoperation were compared between the two groups.

Results: No significant differences were found between the two groups with respect to patient demographics and comorbid conditions. One gracilis (7%) and four VRAM (13%) had significant loss of flap requiring a second pedicled flap for repeat reconstruction. Three gracilis (21%) and five VRAM (16%) required a secondary operative procedure of any nature. Generally, these were debridement of a necrotic area of flap or dehiscence. Finally, no gracilis and four VRAM (13%) suffered complete skin paddle necrosis and loss.

Conclusions: Many flaps in our series suffered minor dehiscence or wound healing issues due inherent challenges of wound healing environment in this population. However, more flaps in the VRAM group suffered complete skin paddle necrosis requiring a new flap reconstruction. This is a potential complication of the VRAM flap that has not been elucidated in previous studies. Although this did not reach statistical significance, the reconstructive surgeon should be aware of this potential pitfall and take it into consideration when choosing the most optimal reconstructive option post APR.

An expertise-based prospective feasibility study comparing trapeziectomy with ligament reconstruction and tendon interposition (T+LRTI) and partial trapeziectomy and tendon

interposition arthroplasty (PT) in patients with advanced basal thumb joint arthri

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Background: This feasibility study aimed to determine the practicality of recruiting participants for, and performing, a larger-scale study comparing the health-related quality of life (HRQOL) and functional outcomes of patients who received either complete trapeziectomy with ligament reconstruction and tendon interposition (T+LRTI) or partial trapeziectomy (PT) at six months post-surgery.

Methods: 60 patients with advanced stage arthritis of the thumb, willing to undergo either T+LRTI or PT were approached; 34 (57%) were eligible, and 100% consented. Feasibility outcomes included: 1) Process: recruitment, patient eligibility, retention and compliance rate (HRQOL questionnaires, DASH, EQ-5D, and SF-36, and functional measurements, grip, key pinch, and tip pinch strength, at 1-week pre-operatively and 1, 3, 6, and 12 months post-operatively), 2) Resources: practices' capacity, 3) Management: determining the practices' commitment to the study and handling of patients' queries, and 4) Scientific: calculation of the variance and effect size (ES) of differences between procedures.

Results: Of the ineligible patients, 21 (81%) were excluded for concomitant hand pathology and previous/future surgery on same hand, particularly carpal tunnel release. Of those who participated, 14 (41%) attended at least one of the four follow-up visits, 24% and 89% from the T+LRTI and PT group, respectively. The highest compliance rate was at 6 months. Attrition rate was 59%. There were large differences in missed appointments between the two practices (16/25 vs 1/9); authors attribute differences to patient-staff rapport and high turn-over of research assistants during the study. The estimate of treatment effect is large for some outcomes and minimal or small for others.

Conclusions: A large-scale study is feasible; however, the following changes are recommended: 1) increase sample size to account for attrition 2) remove exclusion of participants with carpal tunnel syndrome, 3) ensure rapport between office personnel and study patients, and 4) maintain stability with research assistants or ensure overlap during transition.

Increasing student confidence in PBL's consistent coverage of curricular concepts across tutorials: a quality improvement in medical education pilot project

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Background: The PBL approach, a cornerstone of medical education at McMaster, enables students to master self-directed learning of core concepts. Although case-by-case local objectives exist, the lack of standardization around the depth and breadth of content across and within tutorial groups leads to

anxiety and limited confidence among students(1). This quality gap can lead to decreased student mental health safety, ineffective and inefficient studying, inappropriately timed feedback, inequity between tutorial groups, and a lack of inclusivity for students of different backgrounds. This quality improvement projects aims to increase student confidence that tutorials are covering foundational curricular concepts and will be monitored and assessed on a weekly basis as the intervention is incrementally implemented in tutorial groups using PDSA cycles, starting with a 1:1:1 approach at regional campuses, with a complete assessment after it is scaled to include the entire student base.

Methods: Quality improvement methodology including a fish bone diagram and process map were used to understand the perceived gap in student confidence regarding adequate coverage of curricular concepts. A needs assessment of tutors and students will establish a baseline and provide evidence for refining our intervention.The identified gap will be addressed by implementing a detailed checklist of core concepts at the end of each tutorial, maintaining the student-led PBL approach to tutorial preparation but increasing confidence of students in tutorial learning.

Results: Through the post-intervention assessments, we expect to see tutorial-by-tutorial increases in student confidence regarding coverage of foundational curricular concepts. Once a class wide needs assessment has been completed and a baseline established, an evidence-informed target can be set and results can be measured against this target.

Conclusions: The incorporation of a descriptive checklist of objectives at the end of tutorials can yield significant gains in student confidence in the curriculum while maintaining the self-directed aspect of PBL.

Surgical ablation of atrial fibrillation evaluation (SAFE): a cost analysis.

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Background: International guidelines currently recommend concomitant surgical ablation of atrial fibrillation (AF) in patients with known AF undergoing cardiac surgery. However, recent meta-analyses of randomized controlled trials (RCTs) show no significant difference in clinically meaningful outcomes including mortality and stroke in patients who undergo surgical ablation of AF compared to those who do not. Surgically forced maintenance of sinus rhythm, of dubious clinical relevance, is the only observable benefit; and is not achieved in all patients. Based on LAAOS II data, 10 percent of patients undergoing cardiac surgery have a history of AF.

Purpose: Given the absence of clear clinical benefit, we aimed to assess the incremental costs associated with current practice patterns of surgical ablation of AF.

Methods: We describe the additional cost incurred at hospital discharge by performing surgical AF

ablation per 1000 cardiac surgeries in patients with known AF. To estimate clinical outcomes, we used results from a recent systematic review of 23 RCTs which demonstrated no difference in mortality or stroke with surgical AF ablation, but an increase in hospital length of stay (LOS) of 1.67 days. We used data from the ongoing LAAOS III trial to assess the proportion of cardiac surgery patients with AF who undergo concomitant AF ablation (33%) and the breakdown of technique used (69% radiofrequency, 19% cryoablation, 10% cut-and-sew). Incremental costs incurred included the ablation device costs, professional fees, increase in LOS, and increased requirement for pacemaker implantation. Institutional costs were based on average costs for large academic centers in Ontario, professional fees based on Ontario fee schedule and device costs based on Canadian industry data.

Results: The estimated average extra cost of surgical ablation of AF is $4269.05 CAD (95% CI 4096.91 to 4598.19) per patient ablated. Given observed rates of ablation, the gross cost associated with these procedures per thousand AF patients undergoing cardiac surgery is therefore $1,408,786.78 CAD (95% CI 1,351,981.28 to 1,517,401.97). The majority of this is contributed by initial procedure costs (82.3%), while a smaller portion is related to the increased need for pacemaker (3.9%) and increased hospital LOS (13.8%).

Conclusions: With ever increasing health care costs and the need for fiscal responsibility in health care systems, a $4250 CAD procedure with no proven clinical benefit such as surgical ablation of AF is difficult to justify until research demonstrates its impact on clinically meaningful outcomes.

Supplemental learning strategies for McMaster Medicine students - A PRIME QI Project

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Background: There is currently a quality gap in the ability of students to effectively evaluate their content knowledge throughout the program. Currently, 3 assessment strategies are available for students to do so: tutorial time, CAE's, and PPI's. Tutorials cover a broad scope of concepts due to the problem-based learning approach. Students have expressed areas for potential improvement in the current structure of tutorials. Anecdotal evidence suggests tutorials are not always an effective means of evaluating one's knowledge. CAEs, although certainly helpful, have a limited scope that we find is inadequate to fully allow students to test their knowledge. Not all students have the same learning style, so we acknowledge that a question-based approach may not work for all students in the class. That being said, studies have reported that students find that their learning is enhanced when they learn in a multiple choice format. Furthermore, additional short/long answer questions more akin to those of CAE's (but covering a larger scope) can be designed. The premise of our project is based on research findings that repeatedly suggest that repeated assessments lead to better retention and understanding of material.

Methods: The final version of this project will be a standardized resource available through medportal to students to supplement their learning. Each case will have an associated "mastery module" that provides questions that assess concepts relevant to each tutorial case. A recent randomized control trial

found that repeated testing with feedback improves long-term retention to a greater degree than additional studying, and that testing should as a learning tool along with as an assessment tool.

Conclusions: With this program students will have an opportunity to evaluate their understanding concepts with a number of questions. This resource could be a great way to focus tutorial time toward application of problems and review of (now) identified weaknesses.

Health in the shadows: a PRIME initiative to improve the clinical applicability of professional competencies

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Background: McMaster University's medical education program recognizes the importance of the social and cultural aspects of health by including them in its Professional Competencies curriculum. This encourages a holistic understanding of illness by allocating three hours of lecture and discussion per topic. However, there remains a multi-dimensional quality gap. For instance, the time-constrained nature of the weekly sessions results in a mostly theoretical understanding of concepts that are difficult to apply in clinical settings. Additionally, curriculum content is not necessarily timely or student-centered - it is not always tied to current events nor does it allow students to focus on specific concepts of interest. Altogether, this lack of direct applicability could result in a superficial understanding of the social and cultural determinants of health, potentially negatively impacting the care of future patients.

Methods: To address this quality gap, we would like our quality improvement (QI) intervention to enable students to have increased confidence and skill in applying these concepts and navigating clinical scenarios before entering clerkship.A fishbone diagram was used to better understand the quality gap. Each (Plan-Do-Study-Act) PDSA cycle will focus on one particular topic, determined by a needs-assessment survey reflecting the opinions of the Class of 2019.

Results: Our QI intervention is the addition of shadowing experiences relevant to the social and cultural dimensions of health (e.g. Indigenous health and refugee/newcomer health). Shadowing will occur with physicians, allied health professionals and community organizations such as food banks.We hope to implement a variety of opportunities that are relevant to the social determinants of health covered in Professional Competencies. We will assess participant learning using a self-reported proficiency survey.

Conclusions: Ultimately, we aim to improve the competency of medical students so they are better equipped to serve the diverse patients they will see in years to come.

Addressing medical student mental health crises with peer-to-peer engagement: a quality

improvement in medical education initiative pilot project

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Background: Recent studies indicate that mental health issues are prevalent amongst medical students, with 27.2% exhibiting depression or depressive symptoms and 11.1% experiencing suicidal ideation. Of this population, only 15.7% seek out mental health care.1 The wellness curriculum in McMaster's medical program attempts to address the prevalence of mental health concerns. However, it is ineffective and not student-centered as students are not taught the skills to recognize and provide support to peers with mental illness and suicidality. Curriculum timing is problematic: it is only delivered once and not when mental health crises may be most prominent. Existing resources are underutilized, limiting their efficiency and potentially leading to significant harm. This creates an unsafe environment for both students who are struggling and their peers who are unable to recognize a friend or colleague in need. Absence of peer-to-peer recognition of and support for students experiencing mental health issues and suicidality is a significant quality gap. Our aim is to increase comfort and confidence in 100% of pre-clerks with recognizing mental health concerns and suicidal ideation, and providing appropriate peer-to-peer support.

Methods: We used a fishbone diagram to elucidate contributing factors to the identified quality gap. We will conduct a needs assessment surveying all classes to identify and design possible interventions to be piloted in Niagara. Plan-Do-Study-Act cycles will refine our intervention and determine feasibility for wider dissemination.

Results: Surveys will be used to assess the planned intervention on the following measures.

Outcome: knowledge acquisition and student confidence assessed pre and post intervention
Process: utilization of intervention
Balancing: resources (time, cost), additional benefits (student engagement in wellness)

Conclusions: We anticipate that an intervention targeting student comfort and confidence with recognizing mental health concerns and suicidal ideation, and providing appropriate peer-to-peer support will increase utilization of mental health resources.

Quality improvement in pharmacology education at McMaster's pre-clerkship medical program

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Background: Since physicians are the primary prescribers of medications, medical students must a have strong foundation in pharmacology. Currently at McMaster's pre-clerkship medical program, pharmacology is not taught in a systematic or accessible manner. Pharmacology objectives are rarely

included in tutor guides, so students are unaware of the depth of pharmacology knowledge that should be achieved. Furthermore, pharmacokinetic and pharmacological concepts are not evaluated to assess students' knowledge acquisition. Mandatory pharmacology lectures are intermittent, and the optional Clinical Pharmacology Elective series (CPES) has poor student turnout because sessions runs on a pre-determined schedule and are not recorded nor publicized. The specific aim of this project is to improve teaching and accessibility of pharmacology in medical education at McMaster University.

Methods: A fishbone diagram was the quality improvement tool used to deepen our understanding of potential areas with a quality gap for pharmacology teaching in medical education. Multiple iterations of Plan-Do-Study-Act cycles is the methodology of choice for implementation of incremental improvements to the quality gap. A needs-based assessment will be conducted on medical students to gain further insights on perceived knowledge gaps in pharmacology education and methods to address this issue.

Results: This project aims to introduce incremental changes to the pre-existing CPES structure to address the quality gap in pharmacology education. To increase its accessibility, the first change we hope to implement is to record and upload CPES sessions on Medportal. The effectiveness of this project will be measured using CPES student awareness and engagement levels, pharmacology knowledge tests before and one year after implementing the changes, and assessment of unintended problems that may arise.

Conclusions: By increasing awareness and accessibility of the elective series, we hope to increase the number of students who attend CPES and improve the level of students' pharmacology knowledge at the pre-clerkship level.

Evaluation of family history screening for Lynch Syndrome in patients with colorectal cancer

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Background: Colorectal cancer (CRC) is the third most common cancer diagnosis and second most common cause of cancer death in Canadians. The most common genetic cause of CRC is Lynch syndrome (LS), a hereditary cancer syndrome with defects in the DNA mismatch repair genes (MLH1, MSH2, MSH6, and PMS2) (Matloff 2013, Bonadona 2011). LS patients have a 12-48% lifetime risk of CRC and identification of LS in patients can reduce their incidence of CRC and their mortality (de Vos 2013). In Ontario, the current standard of care for genetic testing of LS in CRC patients involves screening the patient for a family history of LS-related cancer. Immunohistochemistry-based (IHC) testing of LS is then only offered if a significant family history is elicited. Family history screening, however, may have limited sensitivity and specificity for detecting LS (EGAPP 2009).

Objectives:

1) Determine the rates of LS in CRC patients presenting to Hamilton Health Sciences using IHC.

2) Determine the sensitivity and specificity of family history screening for LS detection.

Methods: We prospectively offered patients diagnosed with CRC (stage I-IV) IHC-based LS testing in addition to family history screening. Appropriate genetic referrals were made in cases positive for LS. Calculations were conducted in STATA.

Results: A total of 287 CRC patients were recruited for the study and were tested for LS using IHC. IHC testing confirmed 21 patients (7.3%) had defective LS-related proteins. Family history screening for LS yielded 8 true positives and 68 true negatives for a sensitivity and specificity of 38.1% and 68.4% respectively. Tumor location (p=0.001), stage at diagnosis (p=0.013) and presence of medullary growth patten on histology (p=0.001) differed significantly between LS positive and LS negative patients (Pearson's Chi2).

Conclusions: Family screening, as the standard of care for LS screening alone, may be insufficient for LS detection.

Using a quality improvement approach to reinforce basic science concepts at the beginning of each medical foundation in the Degroote School of Medicine's curriculum

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Background: McMaster medical students come from an eclectic range of backgrounds. While divergent academic backgrounds provide a rich array of perspectives in the classroom, it is evident that not all students are beginning their medical school education on an even footing. Students from non-science backgrounds tend to experience some turbulence at the start of each subunit; unlike most of their peers, they are encountering new concepts. Not only does this have an effect on students' synthesis of subject matter during the first few weeks of each subunit, but it can impair group functioning as some individuals lack the scientific fluency to contribute effectively to discussion. Improving this quality gap will make tutorials more effective, efficient, and timely by bringing everyone to the same level of basic scientific fluency; non science students will be more engaged in early tutorials because they have a basis on which to contribute. In improving this quality gap, we also hope to better the wellbeing of non-science students by reducing the potential stress associated with transitioning to medical school without familiarity in the basic sciences. Furthermore, addressing this quality gap will make the medical school curriculum more student-centered and equitable by better tailoring it to the needs of non-science students. Our primary objective is to improve non-science students' self-reported confidence levels at the start of MF1.

Methods: We used the fishbone method to better understand the needs of non-science medical

students. We will conduct and present the preliminary findings of our needs assessment survey to better understand the extent to which a quality gap exists during the initial transition to medical school. Various Plan-Do-Study-Act (PDSA) cycles will be used to improve our proposed intervention before campus-wide implementation.

Results: We hypothesize that non science students will favour the introduction of optional modules that will be provided on Medportal at the beginning of each MF. These modules will provide students with an introduction to key terminology and foundational concepts that are needed to understand pathologies.

Conclusions: By identifying the gaps in the medical school curriculum, we can develop modules that are appropriate for incoming medical students who lack a science background.

Foundations for medical foundations

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Background: Currently, McMaster medical students coming from non-science educational backgrounds (i.e., students with undergraduate degrees other than B.Sc., BHSc., etc.) experience a significant knowledge gap in the basic sciences as compared to their peers. As foundational knowledge in the basic sciences is essential in understanding concepts covered in tutorials, differences in scientific knowledge between students presents a major source of stress for students and a challenge to equity within the program. A quality gap exists in the ability of the current Pre-clerkship curriculum to meet the needs of learners from non-science background. The difficulty experienced by non-science learners in keeping up with Medical Foundations (MF) content is a consequence of: (1) the lack of resources provided on rudimentary science concepts, despite an abundance of higher-level resources; (2) a busy schedule at the start of each MF unit which limits the time available for learning basic concepts required for success in tutorials; and (3) the lack of significant support systems for students coming from non-science backgrounds.

Aim statement: Use QI methodology to improve foundational knowledge of medical students with non-science backgrounds in their understanding of basic sciences during pre-clerkship by creating a guideline for gaining foundation science knowledge that is accessible to students prior to the start each MF unit.

Methods: The testing, implementing, and spreading/scaling this intervention will be approached using a PDSA cycle. The implementation of this project will take into account perspectives from various stakeholders (e.g., MD program office, MF tutors, students) in order to produce a set of guidelines for essential topics covered in the "basic sciences". These guidelines will be used to create a standardized resource containing the essential basic science concepts pertinent to the overarching learning goals of MF1. The standardized resource will also include a consolidated list of links for further reading for each of the concepts and provide an easy-to-navigate directory for accessing additional materials. This

resource will be created in collaboration with stakeholders (students and faculty). Assessments of student engagement with the new resource will be conducted using mid-MF and end-MF surveys beginning with the class of 2020, and will include metrics of student awareness about the resource, use of the resource, and feedback on continued improvement of the tool. Feedback will be implemented into future iterations of the resource designed for each of the subsequent MFs. An anticipated challenge is that students may lack awareness of, or question the utility of this resource because higher-level resources are already available. It will be important to clearly define the objectives of the resource as being pertinent to establishing an understanding of basic science concepts, especially for students lacking such a background in their pre-medical studies.

The impact of incorporating resource stewardship into undergraduate medical curriculum: a quality improvement pilot project for medical education

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Background: Problem-based learning at McMaster allows medical students to explore disease process, presentation, diagnosis, and treatment. However, students receive limited formal education covering resource stewardship, an ethic that guides clinicians to make evidence-based and cost-conscious choices when selecting tests and treatments for patients. With increasing healthcare costs and wait-times, it is imperative that students are trained to make choices that minimize unnecessary tests and treatments to decrease potential harms to patients and reduce healthcare spending. Our quality improvement (QI) project aims to expose 100% of McMaster medical students to resource stewardship before clerkship and increase their confidence in applying it to practice. We will accomplish this by incorporating Choosing Wisely Canada (CWC) recommendations on appropriate resource use into tutorial cases.

Methods: We used QI tools, an environmental scan and fishbone diagram, to identify the gap in coverage of resource stewardship in medical school. We administered a needs assessment survey to clarify this gap, focusing on students' exposure to, attitudes towards, and confidence applying resource stewardship principles. We will use our survey findings to implement Plan-Do-Study-Act cycles to modify our intervention for optimal impact before widespread implementation.

Results: We will use results from the survey to conduct a pilot study that incorporates CWC recommendations into a few tutorial groups' cases, where applicable. After conducting a post-study assessment, we can determine if the intervention improves students' confidence in applying resource stewardship principles. If effective, we aim to incorporate CWC recommendations across all tutorial groups.

Conclusions: Including resource stewardship in the curriculum provides an opportunity to train students to recognize when tests and treatments may be unnecessary. By incorporating CWC recommendations into tutorials, students will have earlier exposure to, and more confidence applying resource stewardship principles; ideally, this will translate to decreased patient exposure to

unnecessary tests and treatments, and reduced healthcare spending.

Design and implementation of a differential diagnosis activity

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Background: Through many years of training, physicians refine the clinical diagnostic reasoning skills required to generate an appropriate differential diagnosis(DDx). This skill takes many years to hone, however medical clerks are expected to be able to generate a limited DDx at the start of clerkship. This skill is not directly taught or tested within the pre-clerkship curriculum. This lack of explicit exposure to generating DDxs makes the chance of a clerk generating an incomplete DDx likely, which could carry into residency highlighting a gap in safety (Norman, Trott, Brooks, Smith, 1994). An issue of equity arises where some students have preceptors who integrate explicit practice in generating DDxs and others do not.

Methods: A fishbone diagram was used to identify invisible causes of the quality gap and to elucidate the systemic issues within the program. A needs assessment survey will be administered to medical students to better understand their experiences with formal training in clinical diagnostic reasoning. Using the information garnered from the quality improvement tools, several Plan-Do-Study-Act (PDSA) cycles will be implemented to monitor the effectiveness of the intervention in fostering clinical diagnostic reasoning skills.

Results: We identified pre-clerk students' exposure to generating DDxs as an area for improvement. We hope to address this gap by integrating a differential diagnosis activity into the curriculum which will be improved via post-intervention surveys. We aim to incorporate balancing measures such as the time needed to generate questions and edit tutor guides as well as use of tutorial time through the use of surveys to be completed by tutors and students.

Conclusions: By implementing this proposed change, we hope to increase student confidence in generating DDxs by 75% as measured by surveys after MF1 and MF5 for the class of 2020. Addressing this learning gap will help pre-clerkship students become more effective clerks.

Improving student self-confidence in knowledge acquisition: quality improvement (QI) in benchmarking at the Michael G. DeGroote School of Medicine

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Background: McMaster medical student evaluations have various drawbacks: only some learning objectives are tested and students cannot view answers after an initial take-up. Consequently, students poorly self-assess their knowledge, hindering efforts to identify steps to better meet learning objectives,

and affecting their confidence and stress. Thus, a quality gap exists in that McMaster medical students are unaware whether they meet tutorial knowledge standards. This gap affects student education due to lack of timeliness of objective feedback reducing students' awareness of knowledge gaps, inefficiency in student tutorial preparation due to lack of comprehension of the expected depth, and variation in tutorial groups leading to inequity in learning. We aim to address this quality gap by proposing an intervention to improve students' ability to benchmark how well they are meeting tutorial knowledge-based learning expectations.

Methods: Using QI methodology, we identified the above-mentioned quality gap, then used a fishbone diagram and the 5-why's tool to better understand factors creating this gap. We conducted an environmental scan, identifying resources at other medical schools that address similar quality gaps. Additionally, a needs assessment will be conducted to better understand McMaster medical students' perception of this quality gap. Plan-Do-Study-Act cycles will be used to improve upon our intervention in response to feedback.

Results: Based on our assessments, we propose the development of an online, multiple-choice self-assessment tool for students. This quiz will be student-curated with faculty approval, containing questions relevant to learning expectations after each Medical Foundation. Immediate feedback and solutions after quiz completion allows students to gauge their performance and identify specific unmet learning objectives to guide subsequent studying.

Conclusions: This proposed learning and self-assessment resource could be used by McMaster medical students to identify knowledge gaps, better master tutorial material, and develop confidence during pre-clerkship.

Understanding and Enhancing Medical Students' Perception of Patient-Centred Care Principles in Medical Education: A Quality Improvement Project

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Background: Physicians are expected to participate in patient engagement and quality improvement initiatives, thus having the knowledge to apply patient centred care (PCC) is essential. PCC is an approach to planning and delivering health care, services or education, that recognizes patients expertise and experience as equal to that of health care providers [1]. The quality improvement project we propose is to increase students who identify PCC principles as valuable by 50% within the current class. This project addresses many aspects of quality, including:

Safety - Appreciating patient's perspectives creates a safer environment, encouraging respect for broad opinions.

Effectiveness - Adopting PCC principles improves patient satisfaction with care [2].

Efficiency - Integrating PCC principles into Professional Competencies requires minimal resources.

Timely - Exposure to PCC will prepare students to be leaders in this field.

Equitable - Ensuring medical students value patient input is essential for representation of population groups in healthcare.

Student-Centred - PCC will deliver on students' interest to have diverse perspectives represented.

Methods: We determined the need for emphasis on PCC within the medical curriculum. We will conduct a survey of the medical class to gauge understanding of PCC principles and gather recommendations from students for integrating PCC into the curriculum. Additional surveys will be completed following implementation of improvements to assess effectiveness of the PCC content.

Results: An intervention to increase PCC principles in medical curriculum will be designed and implemented. The indicators of improvement that will be measured include:

Outcome: perceived importance of PCC among students

Process: satisfaction with the change in Professional Competencies

Balancing measures: satisfaction with Professional Competencies before and after the intervention.

Conclusions: This project seeks to measure medical students' perspectives of PCC before and after improvements have been implemented in Professional Competencies sessions. This project aims to foster awareness among medical students about the importance of PCC in practice.

The relationship between selective serotonin reuptake inhibitors and incidence of bone fractures: a systematic review and meta-analysis

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Background: Selective serotonin re-uptake inhibitors (SSRIs) are used to treat depression, a common mental health concern amongst the elderly. However, studies have reported an association between SSRIs and an increased risk of fracture. Since the last systematic review on this issue, several large prospective cohort studies have been published, thus requiring an updated systematic review and meta-analysis.

Methods: We identified relevant studies published by February 1, 2015 through grey literature and electronic databases (MEDLINE, Embase, CINAHL and PsycINFO). Randomized controlled trials and observational studies examining the incidence of fracture or changes in bone mineral density (BMD) in patients over 18 being treated by an SSRI were included. Studies with less than 10 patients or without a

comparator group were excluded. Two reviewers independently extracted the data.

Results: We identified 26 cohort and case-control studies and 11 met the criteria for a meta-analysis. The inter-rater reliability was Kappa = 0.865, 95% CI (0.760, 0.970). The primary outcome was the risk of any self-reported fracture(s) at any site associated with SSRI use. A random-effects meta-analysis was conducted due to the heterogeneity of the populations (I2 = 92.0%). Results showed significant positive association between SSRI use and risk of fracture at any site (OR = 1.63, 95% CI 1.50, 1.78). Analysis of secondary outcomes showed a higher risk associated with hip fractures (OR=1.61, 95% Cl 1.35, 1.91) compared to vertebral fractures (OR=1.14, 95% Cl 1.00, 1.29). Effects on BMD and subgroup analyses were also conducted.

Conclusions: Our findings indicate that SSRIs may play an important modifiable role in fracture development. Clinicians should be aware of these possible effects and carefully consider their decision to prescribe SSRIs, especially for patients at an elevated risk. It may also warrant bone density testing for those already on SSRIs.

Increasing confidence in POCUS technique and interpretation among medical students: a quality improvement in medical education initiative

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Background: Point of Care Ultrasound (POCUS) is an increasingly useful diagnostic tool used by multiple disciplines to complement traditional clinical examinations. Several studies have shown that teaching POCUS in the undergraduate medical curriculum is beneficial to student confidence in a clinical setting. While McMaster University's pre-clerkship curriculum introduces students to POCUS, there is a need amongst students for increased program-wide competency in POCUS. Anecdotal evidence suggests that POCUS skill development could be more equitable across groups and campuses. POCUS education could be delivered more efficiently, effectively, and timely, such that it is concurrent with relevant clinical examination. Ultimately, addressing these quality gaps may also improve student confidence when performing POCUS.

Methods: A systematic approach using quality improvement (QI) methodology and tools was implemented to identify a quality gap in McMaster University's pre-clerkship POCUS curriculum. Factors contributing to this gap were retrospectively analysed using a 5 Why's Analysis and resource deficiencies were identified using a Fishbone Analysis. A needs assessment survey of c2019 students provided preliminary data on students' perceptions of POCUS curriculum. Feedback informed development of a clinical skills-centered intervention, which will be implemented during Medical Foundation one through three. PDSA cycles were implemented and refined iteratively based on student feedback. Optimization of the intervention will be achieved before widespread implementation across all three campuses.

Results and conclusions: We aim to improve student confidence in POCUS by 50% through Medical

Foundation one to three. Success of the intervention will be assessed using a post-intervention survey of student knowledge and confidence in using POCUS. Subjective outcome measures of student confidence will include self-assessment of ability to identify and locate structures, manipulate the ultrasound probe, and interpret ultrasound images. Implementing a small-group, student-centred POCUS curriculum has the potential to benefit all McMaster University medical students regardless of specialty interest and skill level.

Undergraduate dermatology education in Canada: a national survey

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Background: Canadian dermatology curriculum was reviewed in 1983, 1987, 1996 and 2008 (1, 2, 3, 4). All these surveys highlighted the disproportionately low level of dermatology teaching in relation to the significant amount of skin disease seen by physicians. An American study showed that close to 90% of medical students felt they received inadequate dermatology training (5), and a survey of Canadian internal medicine residents found that >80% of respondents were either uncomfortable or very uncomfortable in diagnosing and managing skin lesions (6). Since the official adoption and dissemination of the Canadian Professors of Dermatology (CPD) core curriculum and competencies, there has been no assessment of how these changes have influenced dermatology curriculum.

Objective: This survey gathered information on the current status of undergraduate dermatology education across Canadian medical schools.

Methods: A survey was sent electronically to all undergraduate dermatology directors at each of the 17 Canadian medical schools.

Results: Between 2008 and 2017, dermatology teaching has increased 25% to 25.6 ± 17.2 hours of teaching. However, 75% of this teaching is delivered in pre-clinical years. The number of faculty members, both dermatologists and non-dermatologists, has also increased. A growing number of schools are now using electronic formats of teaching. A majority of schools (59%) are covering all the CPD core curriculum topics.

Conclusions: Dermatology education is demonstrating positive trends with regards to teaching hours and faculty members. Nevertheless, a more even distribution of content so that students have increased clinical exposure should be achieved. Furthermore, an online atlas of resources would be greatly helpful in standardizing curriculum.

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