10th Annual

McMaster Medical Student Research Day

April 24th, 2019

MUMJ

MMSC
McMaster Medical Student Council

Michael G. DeGroote School of Medicine

McMaster University
HEALTH SCIENCES

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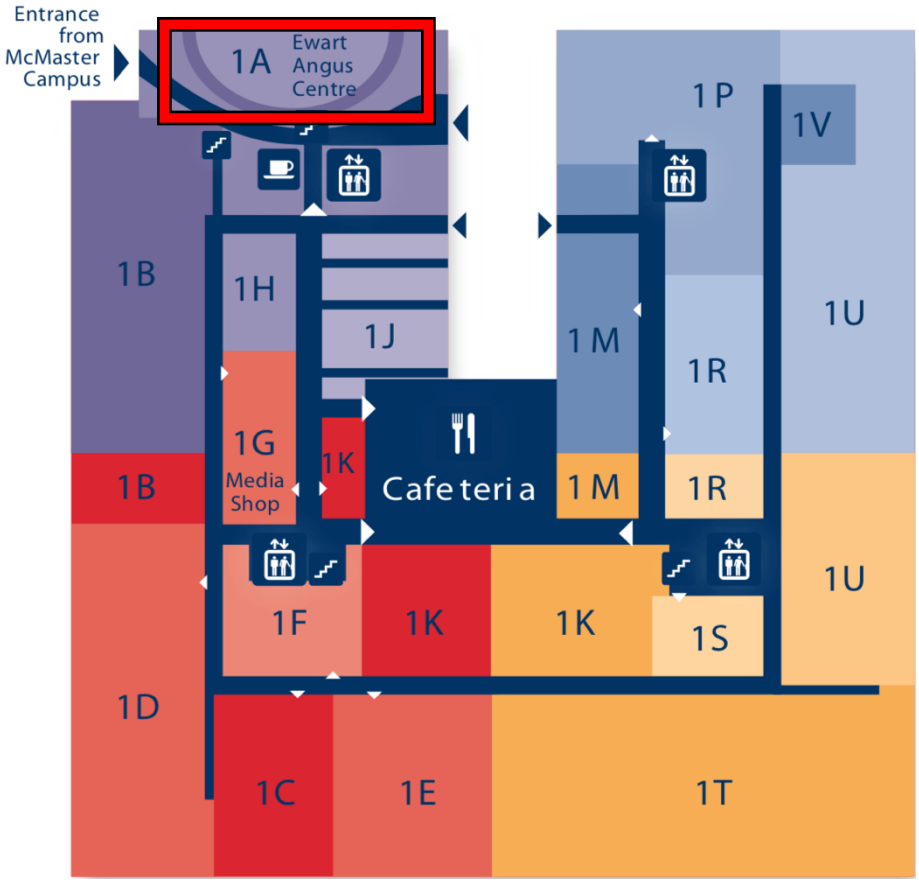
11:00 – 12:30pm	Poster Presentations - Morning Session	Foyer
12:30 – 1:30pm	Keynote and Lunch - Keynote starts 12:45pm	HSC 1A1
1:30 – 3:00pm	Poster Presentations - Afternoon Session	Foyer
3:00 – 4:30pm	Oral Presentations - Afternoon Session	HSC 1A1
4:30 – 5:00pm	Closing Remarks and Awards Presentation	HSC 1A1



McMaster University Medical Centre (MUMC) – 1st floor

PREP@McMaster Joins MMSRD

The **P**re-medical **R**esearch **E**ngagement **P**rogram at McMaster (**PREP@McMaster**) is a program designed to jumpstart research awareness and conference participation in undergraduate students considering a career in medicine.

PREP@McMaster 2019 will be an opportunity for advanced undergraduate health sciences students to interact with and observe medical students at the McMaster Medical Student Research Day (MMSRD). This conference will be a vital networking opportunity to connect undergraduate students with medical students, clinicians and researchers. This experience will also provide valuable exposure to current issues in medical research and study methodology.

Please join us in welcoming the students of PREP@McMaster to the MMSRD!

PREP@McMaster Schedule

8:30-9:15am	**Check-in**
9:15-9:30am	**Welcome Remarks**
9:30-11:00am	**Oral Presentations – Morning Session**
11:00-12:30pm	**Morning Panel: Ask a Medical Student** (applying to medical school, choosing medicine, life in medical school) Facilitator: Quinten Clarke Panel Speakers: Lena Dolman, David Shin, Darren Chai, Ashley Warnock, Kent Tang
12:45-1:30pm	**Keynote & Lunch**
1:30-3:00pm	**Afternoon Panel: Finding Research Opportunities** (identifying interests, tips & tricks for finding opportunities, advice when approaching a potential supervisor, research in medical school) Facilitator: Benjamin Wang Panel Speakers: Jonah Elfassy, Lauren Riehm, Terry Thach, Victoria McKinnon, Satyam Choudhuri
3:00-4:30pm	**Oral Presentations – Afternoon Session**
4:30-5:00pm	**Closing Remarks & Awards Presentation**

Acknowledgements

Keynote Speaker - Dr. Paul O'Byrne

Judges

Dr. Ellen Amster
Dr. Rae Brager
Dr. Brian Coombes
Dr. Brad Doble
Dr. Cagla Eskicioglu
Dr. Adam Fleming
Dr. Alison Fox-Robichaud
Dr. Kevin Jones
Dr. Mark Larche
Dr. Derek Lobb
Dr. John Lee
Dr. Jakob Magolan
Dr. Peter Margetts
Dr. Matthew Miller
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Dr. Alim Pardhan
Dr. Jeffrey Pernica
Dr. Ally Prebtani
Dr. Constantine Samaan
Dr. Mary Sherlock
Dr. Deborah Siegal
Dr. Fiona Smaill
Dr. John Whitney

Co-Chairs and Committee Chairs

Charlotte McEwan & Ali Zhang (MMSRD Co-Chairs)

Manan Ahuja (Communications Chair), Yosef Ellenbogen (Judging Chair)
Diana Varyvoda (Logistics Chair), Madelaine Leung (Scientific Chair)

Organizational Committees

Scientific

Megan Banting
George Hu
Edward Koo
Sophie Laramee
Cameron Leveille
Ryan O'Reilly
James Podrebarac

Logistics

David Beisel
Matthew Cooper
Maxwell Gelkopf
Jessica Gormley
Christopher Lee
Gaurav Talwar
Madison Walker

Communications

Jessica Gormley
Sophie Laramee

Judging

Sophie Laramee
Annphin Mathew
Ryan O'Reilly
James Podrebarac
Sophie Ramsden

Event Sponsorship and Special Thanks

McMaster Medical Student Council
McMaster Undergraduate Medical Journal
Undergraduate MD Office

MMSRD History

Welcome to the 10th Annual McMaster Medical Student Research Day (MMSRD)! MMSRD was first founded in 2010 by Alex Kaplan (MD Class of 2012) with the goal of highlighting 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), Roman Reznikov and Isabel Kim (2015/16), Karishma Manji and Marina Wang (2016/17), Aadil Bharwani and Jennifer Asselstine (2017/18), and Charlotte McEwen and Ali Zhang (2018/19).

The MMSRD committee is proud to showcase student accomplishments in all areas of research, including the basic sciences, clinical research, medical education, population health, and health policy. Moving into the next decade of MMSRD, we hope this conference will continue to grow and provide important opportunities for medical education about research, dialogue about new methods of research, and opportunities for interaction between medical students and the research community.

Welcome from the Co-Chairs

Dear students, faculty, and community members,

It is our pleasure to welcome you to the 10th annual McMaster Medical Student Research Day (MMSRD), which proudly showcases the tremendous efforts and achievements of McMaster University's MD and MD/PhD students. The 2019 MMSRD committees have put together an exciting program that features Dr. Paul O'Byrne as the keynote speaker.

Our scientific program again features both poster and oral presentations. We thank all the students who have submitted abstracts, and the abstract committee, who have had the difficult task of choosing twelve student speakers from the pool of excellent abstract submissions. Poster and oral presentations are divided into four categories: basic sciences, clinical research, community research, and quality improvement. These categories reflect the diversity and strength of research undertaken by students at McMaster.

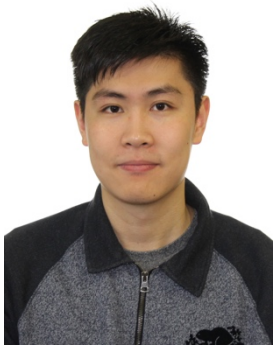
This year, we are changing the poster presentation sessions to be completed in a group format. Poster presenters will be placed in a group, consisting of several poster presenters and a faculty judge, according to their category of research. The students and the judge will rotate through each poster presentation within the group. Each student will have the chance to present their poster, answer questions, and receive feedback from both peers and the faculty. The presentations will be scored by the judge, and the top presenter from each group will receive a prize. We hope that this new format will prove engaging and provide a valuable learning and networking opportunity.

We would like to thank the McMaster Medical Student Council and the McMaster University Medical Journal for the funding provided, without which MMSRD would not have been possible. We would also like to thank Naznin Alam and Dr. Constantine Samaan, both of whom have helped immensely with planning and logistics. We would also like to thank all the organizing committee members for their hard work in making MMSRD 2019 a success.

Thank you for being a part of MMSRD 2019. We are extremely impressed by the quality of research and are thrilled to provide this platform to showcase it. We hope that you discover unique insights from a breadth of perspectives, and form ties that strengthen our ever-growing community.

Sincerely,

Charlotte McEwan
MD Candidate
Class of 2021



Ali Zhang
MD/PhD Candidate
Class of 2024

Keynote Speaker

Dr. Paul O'Byrne is the Dean and Vice-President, Faculty of Health Sciences at McMaster University, and the Dean of the Michael G. DeGroote School of Medicine. He is also a Distinguished University Professor of Medicine at McMaster, a world-renowned researcher and a practising respirologist. He became Dean and Vice-President in July 2016 after 14 years of service as the chair of the faculty's largest department, the Department of Medicine.

Dr. O'Byrne obtained his medical degree at University College Dublin in Ireland and completed his internal medicine and respiratory medicine training at McMaster University. He undertook research training at both McMaster University and the Cardiovascular Research Institute in San Francisco, California. He joined the faculty at McMaster in 1984.

His research interests are on the mechanisms and treatment of asthma, particularly the role of environmental allergens and the mechanisms by which these cause airway inflammation. He has published more than 400 peer reviewed papers, including papers in New England Journal of Medicine, Lancet, Nature Medicine, AJRCCM, JACI and Journal of Immunology. He has authored 98 book chapters and edited 12 books.

Morning Oral Presentations (HSC 1A1)

9:30 **Clinical Science: Antidepressants in the management of postsurgical pain: a systematic review and meta-analysis of randomized trials**
*Yvgeniy Oparin, Joshua S. Tobe, Li Wang

9:45 **Quality Improvement: Factors associated with surgeons' perception of distraction**
James Jung, *Jonah Elfassy, Teodor Grantcharov

10:00 **Clinical Science: High-Dose Ambroxol Pharmacokinetics in Parkinson's Disease Dementia Patients**
*Michelle Murdock, Rommel Tirona

10:15 **Basic Science: White matter inflammation in a transgenic Alzheimer's disease rat model with subcortical stroke**
*Vineeth Bhogadi, Seung-Hun Oh, Shawn N. Whitehead

10:30 **Clinical Science: Bradycardia and burn patient outcomes**
*Gaurav Talwar, Sarah Rehou, Marc G. Jeschke

10:45 **Community Research: Hepatitis C knowledge and training among people working in the alcohol and other drugs sector**
*Eilish Scallan, Robert Calder, Carla Treloar, Kyle R. Dyer

Afternoon Oral Presentations (HSC 1A1)

3:00 **Clinical Science: Association between the use of surrogate measures in pivotal trials and health technology assessment decisions: A retrospective analysis of NICE and CADTH reviews of cancer drugs**
*Ashlyn Pinto, Huseyin Naci, Emilie Neez, Elias Mossialos

3:15 **Quality Improvement: Getting youth and families "Back on Track": a retrospective chart review of patients in McMaster's Back on Track Program for children living with type 1 diabetes.**
*Kristen Salena, Hilary Swanson, Leigh Drong, Joanne Gibson, Burke Baird, Karen McAssey

3:30 **Basic Science: Staphylococcus aureus leukocidins target endothelial DARC to cause lethality in mice**
Ashira Lubkin, Warren L. Lee, Francis Alonzo 3rd, Jason Aligo, Matthew Keller, Changsen Wang, Natasha M. Girgis, Tamara Reyes-Robles, Aidan O'Malley, Rita Chan, Junjie Mei, Peter Buckley, Nikollaq Vozhilla, Marilyn Vasquez, *Johnny Su, Eric Chen, Patricia Martin, Cynthia Loomis, Russell Vance, G. Scott Worthen, Anthony Simon Lynch, Daniel Weinstock, P'ng Loke, Ken Cadwell, Victor J. Torres

3:45 **Community Research: Assessing capacity to serve sex workers in Hamilton: a needs assessment**
*Ashley Warnock, *Shannon Brent, Dr. Robin Lennox

4:00 **Basic Science: Development of an Anthropomorphic Dynamic Heart Phantom**
*Sherif Ramadan, Narinder Paul, Hani E. Naguib

4:15 **Clinical Science: Oncologic Outcomes in Prone Compared to Lithotomy Positioning During Abdominoperineal Resection: A Systematic Review and Meta-Analysis**
Tyler McKechnie*, Yung Lee, Jeremy E. Springer, Aristithes G. Doumouras, Dennis Hong, Cagla Eskicioglu

Morning Poster Presentations - Basic Science

Andrew Cao:	"A potential mechanism underlying muscle pain in statin users"
Connor Lewicki:	"Investigating amyloid precursor protein signaling and internalization using antibody-coated beads in a mouse neuroblastoma cell line"
Daniel Lazzam:	"N-acetyl glucosamine analogues to probe polymerizing glycosyltransferases"
Daniel Levin:	"Green Templating of Ultraporous Cross-Linked Cellulose Nanocrystal Microparticles"
Lilian Laferriere:	"The impact of napping on the consolidation of clinically-relevant information: a comparison of depressed and healthy individuals"
Christopher Chiang:	"Evaluation of the efficacy of a peptide mimetic therapeutic on a human thioredoxin scaffold for the treatment of respiratory syncytial virus"
Jasper Ho:	"Sierra-local: a lightweight standalone application for HIV-1 drug resistance prediction"
Leanne Kim:	"Generation of single splice variant mutant Caenorhabditis elegans using CRISPR/Cas9 genome editing tool"
Michael Sun:	"The influence of microenvironmental factors on in vitro effector function of engineered T cells against multiple myeloma"
Rishi Sharma:	"Gene expression profile is different between intact and enzymatically digested equine articular cartilage"
Wajahat Syed:	"Caloric restriction, exercise, or both for weight loss in adults aged 18-50: a systematic review and meta-analysis"

Morning Poster Presentations - Clinical Science

Sama Anvari:	"Double-balloon enteroscopy for diagnostic and therapeutic ERCP in patients with surgically altered gastrointestinal anatomy: a systematic review and meta-analysis"
Betty Zhang:	"Fragility of Statistical Findings in Medicine and Surgery"
Manan Ahuja & Jessica Gormley:	"Rest-up: Researching the effects of sleep on step count during the postoperative period"
Steven Chen:	"Rapid response programs in supporting evidence-informed decision-making: A scoping review of current methods and models"
Terry Thach:	"Worked examples for teaching ECG interpretation: salient features or discriminating features?"

April (YiChen) Liu:	"Effectiveness of De-prescribing on Mobility: Systematic Review and Meta-analysis"
Arielle Geist:	"Delivery of palliative and end of life care to adolescents and young adults diagnosed with advanced stage cancer"
Michael Uy:	"Cemented Humeral Stem versus Press-fit Humeral Stem in Total Shoulder Arthroplasty: A Systematic Review and Meta-Analysis"
Teffran Chan:	"Type A botulinum toxin in the management of salivary otorrhea – a case report"
Victoria Liu:	"Retrospective study of ocular involvement in patients with candidemia"
Jared Cohen:	"Sugammadex in Ontario hospitals: Access and institutional policies"
Kevin Karivelil:	"Relationship between exposure to household air pollution and asthma in children: a systematic review and meta-analysis."
Kristin Wright & Maggie McNeill:	"The Impact of Uterine Size on Patterns of Recurrence in Patients Diagnosed with High-grade Endometrial Cancer Undergoing Minimally Invasive Surgery; A Multi-Centre Canadian Study"
Michael Parvizian:	"Association between dietary patterns and risk of COPD in adults: a systematic review"
Michael Parvizian:	"Neonatal Outcomes after Transfusion of ABO Non-Identical Blood (Neo-ABO)"
Arunachala (Ramana) Trivedi:	"Exploring MRI as a biomarker to support clinical observation in Parkinson's disease"
Max Zworth:	"The provision of medical assistance in dying: a scoping review"
Maxwell J Gelkopf:	"The Canadian Retinoblastoma Research Advisory Board: A Framework for Patient Engagement"
Meghan Glibbery:	"Characterizing the left and right atrial adaptations in middle-aged chronic endurance athletes: a cMRI study"
Amanda Lee:	"Benefits and risks of anaphylactic interventions: a systematic review and meta-analysis"
Olivia Lovrics:	"Metabolic outcomes after bariatric surgery for Indigenous patients in Ontario"
Ashlyn Pinto:	"Availability of evidence of benefits on overall survival and quality of life of cancer drugs approved by European Medicines Agency: retrospective cohort study of drug approvals 2009-13"
Dimitra Bednar:	"Rest for concussion in youth: a systematic review"
Marc Levin:	"Survival outcomes of marijuana users in p16 positive oropharynx cancer patients."

Morning Poster Presentations - Quality Improvement

Cameron Leveille:	"Feasibility of Standardizing Pre-operative Assessment Clinics Across a Hospital System"
Grace Xu:	"Gender disparities in pediatric critical care research"
Lauren Beals:	"Febrile neutropenia in the emergency department: a prospective threat and error analysis"
Lauren Beals:	"Ice cream rounds: exploring protected academic time for medical student wellness"
Lauren Riehm & Christina Ma:	"Assessing quality of goals of care conversations during the Serious Illness Care Program quality improvement Initiative"
Maxwell Ng:	"The McMaster Medical Compendium: Re-imagining medical education through a student-led initiative of self-directed learning and mentorship"

Morning Poster Presentations - Community Research

Erica Sacoransky & Franciska Shaw:	"The healthcare experiences of adults with substance use disorders in the perinatal period"
Keean Nanji:	"Traumatic Recreational Eye Injuries and the PROTECT Initiative"
Sejal Joshi:	"A narrative account of the experiences of people who use drugs while under hospital care in Hamilton, Ontario"
Shannon Brent:	"Effect of seasonal influenza vaccination on influenza severity in Hutterite communities: Follow-up study of a randomized trial"

Afternoon Poster Presentations - Basic Science

Christopher Chiang:	"Development of a novel peptide mimetic therapeutic for respiratory syncytial virus"
Darren Chai:	"Interaction between NBEAL2 and P-selectin"
Hannah Kearney:	"Exploring Interoception"
John Kim:	"Myelin-related protein expression and oligodendrocyte-lineage cell populations in the uncinate fasciculus of depressed suicides"
Yu Fei Xia:	"Maternal diet-induced obesity (mDIO) alters maternal and fetal hepatic gluconeogenesis at embryonic day 14.5"

Afternoon Poster Presentations - Clinical Science

Anisha Dubey:	"Appendectomy in surgical management of mucinous ovarian neoplasms"
Candice Luo:	"Cannabis and Methadone Maintenance Treatment for Opioid Use Disorder: A Systematic Review and Meta-Analysis"
Dimitra Bednar:	"Determining the effects of return to activity and return to school guidelines on children with concussion: A systematic review."
Ashlyn Pinto:	"Clinical Outcomes of Intravitreal Bevacizumab compared to Laser Photocoagulation in Retinopathy of Prematurity: 11-Year Retrospective Study"
Cameron Leveille:	"Reporting Outcomes and Outcome Measures in Open Rhinoplasty: A Systematic Review"
Connor Lewicki:	"Physicians' opinions and patients' treatment outcomes following genetic testing for psychiatric medications"
Lauren Beals:	"Pediatric cyclic vomiting syndrome – ten years of emergency department data"
Tyler McKechnie:	"Extended thromboprophylaxis following colorectal surgery in patients with inflammatory bowel disease: A clinical review"
Giuliana Guarna:	"Gestational diabetes, obesity and hypertension among Ontario midwifery clients: a mixed methods study"
Marc Levin:	"Pediatric Pre-Tonsillectomy Education Programs: A Systematic Review"
Michael Uy:	"Bariatric surgery in patients with a history of nephrolithiasis: 24-hour urine profiles and radiographic changes after roux-en-y gastric bypass versus sleeve gastrectomy"

Sama Anvari:	"Urgent versus Standard Colonoscopy for Management of Acute Lower Gastrointestinal Bleeding: A Systematic Review and Meta-Analysis of Randomized Controlled Trials"
Teffran Chan:	"Transorbital endoscopic resection of a metastatic orbital paraganglioma: a new approach to a rare disease"
Keean Nanji:	"A Review Evaluating Retinal Detachments Post Endophthalmitis"
Keean Nanji:	"Involvement of the Posterior Intracranial Circulation in Giant Cell Arteritis"
Lena Dolman:	"International BRCA1/2 variant data-sharing practices"
Manreet Dhaliwal:	"Relationship between dietary patterns and asthma in children: a systematic review and meta-analysis"
Maroof Khalid:	"Patients on maintenance dialysis with a Family History of Kidney Disease have more Transplant Knowledge"
Oluwatobi Olaiya:	"Post-market modifications of high-risk plastic surgery devices"
Sally Lin:	"Can Epstein-Barr virus be sexually transmitted? A case report"
Shannon Gui:	"Acute management of pediatric cyclic volume syndrome: a systematic review"
Sureka Pavalagantharajah:	"The prevalence of obstetric risk factors in pregnancies with vasa previa: a systematic review and meta-analysis"
Zechen Ma:	"The impact of vocational interventions on vocational outcomes, quality of life, and community integration in adults with childhood onset disabilities: a systematic review"

Afternoon Poster Presentations - Quality Improvement

Stefano Lopiccolo:	"Evaluation of strategies to accomplish universal BRCA1/2 testing for women with high grade serous ovarian cancer at the Juravinski Cancer Centre"
Chloe Wong:	"Increased postoperative cardiac events in Hamilton: early detection or over estimation? Findings from our institution and review of recommended clinical practice guidelines"
Kent Tang:	"Do active assist transfer devices improve transfer safety for patients and caregivers in hospital and community settings? A scoping review."
David Shin:	"Testing the effectiveness of a virtual reality versus traditional bell ringer examination format"
Sarah Forbes:	"Building resilience: the conceptual basis and research evidence for Resilience Training Programs"

Afternoon Poster Presentations - Community Research

Alison Knapp:	"The intergenerational effects of HIV in rural Kenya"
David Beisel:	"Flexible bodies, vulnerable minds: Analyzing the context of mental health policy in theatre and performance employment"
Nadia Igdoura:	"Young Muslim women's perceptions of sexual health: a qualitative study"
Satyam Choudhuri & Hassaan Abdel Khalik:	"Revisiting Canadian Medical School Efforts to Increase Class Diversity: A Statistical Analysis"

Morning Oral Presentations - 9:30am

Clinical Science: Antidepressants in the management of postsurgical pain: a systematic review and meta-analysis of randomized trials

***Yvgeniy Oparin** (1), Joshua S. Tobe (2), Li Wang (2)

(1) Michael G. DeGroote School of Medicine
(2) McMaster University, Department of Anesthesia

Current multimodal analgesia for postsurgical pain often employs opioids, acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs), and other adjuncts such as gabapentin or pregabalin. Nevertheless, inadequate pain control and adverse effects are still common. Antidepressant medications demonstrate effective analgesia in chronic pain treatment, suggesting potential for their use in postsurgical pain. Recent randomized control trials demonstrate that selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs) provide benefit when added to a multimodal analgesic in postsurgical patients. We conducted a systematic review and meta-analysis to assess efficacy.

We searched MEDLINE, EMBASE, CINAHL, PEDro and CENTRAL, for randomized trials that enrolled adult patients undergoing any surgery and randomized to perioperative SSRI or SNRI as intervention, or control (active comparator or placebo). We assessed certainty of evidence using the GRADE approach. We performed random effects meta-analysis and pooled pain intensity after converting all pain scales to the 10cm Visual Analogue Scale (VAS).

We identified 791 citations, of which 13 trials (n=1382) were eligible for review. Preliminary analysis demonstrated that SSRI/SNRI intervention significantly reduced postsurgical pain at 24h, with a -0.8 cm change on a 10cm VAS (95% CI: -1.31 to -0.29). Postsurgical pain at other analyzed time points was also reduced: 6h (-0.40, 95% CI: -0.81 to 0.01), 12h (-0.45, 95% CI: -1.29 to 0.38), 48h (-0.61, 95% CI: -1.34 to 0.11), and 72h (-0.83, 95% CI: -2.11 to 0.45), although these results were not significant.

We found moderate quality evidence that perioperative SSRI/SNRI administration reduced postsurgical pain at 24h, and low quality evidence that pain at 6h, 12h, 48h, and 72h was also reduced. Further analyses will include chronic postsurgical pain and adverse effect profile. We will conduct subgroup analyses for type of surgery (e.g. general, orthopedic, gynecological etc.), duration of surgery, and ASA physical status classification.

Morning Oral Presentations - 9:45am

Quality Improvement: Factors associated with surgeons' perception of distraction

James Jung(1,2), ***Jonah Elfassy**(2), Teodor Grantcharov(1,2)

(1) Department of Surgery, University of Toronto, Toronto, Ontario, Canada
(2) International Centre for Surgical Safety, St. Michael's Hospital, Toronto, Ontario, Canada

Distractions in the operating room (OR) can create stress among surgeons and lead to higher chances of errors and adverse events. The objective is to determine intraoperative factors that are associated with surgeons' perception of distraction.

We conducted a prospective cohort study in 287 consecutive patients undergoing elective laparoscopic general surgery during the 2 years after the implementation of a data capture system called the OR Black Box to identify intraoperative sources of distraction. At the end of each operation, human factor surveys were administered to assess whether surgeons felt distracted. Using a multivariable logistic mixed model with random intercepts for individual surgeons, we determined which intraoperative sources of distraction were associated with the surgeons feeling distracted in the OR.

Surgeons reported feeling distracted in 125 of 287 operations (44%). Auditory sources of distraction, such as the OR door opening, occurred at a median of 41 times per case (interquartile range [IQR] 32–54) and external noise occurred at
median of 95 times per case (IQR 65–133). Cognitive distractions such as teaching (155 operations [54%]), device malfunction (100 [35%]), irrelevant conversations (75 [26%]), management of the next case (44 [15%]) and time pressure (22 [8%]) occurred in a significant number of operations. In a multivariable analysis, the presence of irrelevant conversations (odds ratio 1.89, $p = 0.03$) and longer procedure duration (1.02, $p < 0.01$) were independently associated with increased likelihood of the surgeons feeling distracted.

Morning Oral Presentations - 10:00am

Clinical Science: High-Dose Ambroxol Pharmacokinetics in Parkinson's Disease Dementia Patients

***Michelle Murdock,** Rommel Tirona

Department of Physiology and Pharmacology, Schulich School of Medicine and Dentistry, The University of Western Ontario, London, Ontario, Canada

Parkinson's Disease Dementia (PDD) is associated with heterozygous mutations in GBA1, which codes for the enzyme glucocerebrosidase (GCase). In PDD, alpha-synuclein aggregates accumulate in the brain, leading to the formation of Lewy Bodies. Currently, here are no effective treatments for this disease. Ambroxol is an over-the-counter mucolytic, often co-administered with antibiotics to treat lung infections. Following the discovery of Ambroxol's ability to restore the activity of GCase, the drug's application in treating Gaucher Disease, a disorder in which patients have homozygous null mutations in GBA1, showed promising results. While Ambroxol has been effective in reversing PDD in cell culture models, no human trials have taken place. Specifically, very little is known regarding high-dose Ambroxol pharmacokinetics, nor its interactions with the enzyme cytochrome P450 3A4 (CYP3A4). We seek to fill this void in scientific knowledge in hopes of applying Ambroxol as a safe and effective treatment for PDD patients in the future. We hypothesize that high-dose Ambroxol will demonstrate first-order pharmacokinetics and that it will act as an inhibitor of CYP3A4.

Plasma samples were collected from PDD patients enrolled in a phase II, double-blinded, placebo controlled trial. Liquid chromatography-Tandem Mass Spectrometry was used to determine plasma drug levels. Cell culture assay was performed with a midazolam probe to determine if Ambroxol inhibits CYP3A4.

As predicted, Ambroxol demonstrates first-order pharmacokinetics. Contrary to our prediction, Ambroxol does not inhibit CYP3A4, but appears to increase midazolam metabolism.

The first result suggests that Ambroxol will be easily and safely prescribed with predictable pharmacokinetics. Our second experiment suggests that Ambroxol may have more nuanced interactions with CYP3A4 which have yet to be uncovered, but could be equally meaningful to potential drug-drug interactions.

Morning Oral Presentations - 10:15am

Basic Science: White matter inflammation in a transgenic Alzheimer's disease rat model with subcortical stroke

***Vineeth Bhogadi**(1,2), Seung-Hun Oh(2), Shawn N. Whitehead(2,3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Department of Anatomy and Cell Biology, Schulich School of Medicine and Dentistry, Western University, London, Ontario, Canada
(3) Department of Clinical Neurological Sciences, University Hospital, Western University, London, Ontario, Canada.

Alzheimer's disease (AD) and stroke co-exist and reciprocally interact to differentially affect cognitive outcomes. Yet, how they interact is not sufficiently understood. Executive dysfunction, a key clinical manifestation of both stroke and AD, is heavily dependent on functional white matter connectivity between different brain regions. Thus, it is possible that white matter inflammation could explain the clinical connection between these two disorders. We hypothesized that white matter inflammation and executive dysfunction are positively correlated in the rat, and both are exacerbated in a transgenic Fischer rat with subcortical stroke.

Transgenic Fischer 344-APP21 (TgF344) rats overexpress human amyloid precursor protein (hAPP) but do not spontaneously develop overt amyloid-beta (Aβ) pathology, making them ideal to model the effect of ischemic stroke in early stages of AD. A subcortical ischemic stroke was modeled using a single injection of endothelin-1 (ET-1) into the striatum. Immunohistochemistry was then performed on the brains of these animals to assess white matter inflammation and neuronal degeneration. Correlations were drawn between behavioral parameters from Levit et al. (2017) and the immunohistochemistry performed on the same cohort of animals.

We demonstrate that the injection of endothelin-1 (ET-1) into the dorsal striatum of TgF344 rats produced a significant exacerbation of white matter inflammation that was distinct from the saline injected wildtype and TgF344 rats as well as ET-1 injected wildtype rats. Additionally, we showed a positive correlation between white matter inflammation in the corpus callosum/internal capsule and regressive/perseverative errors made during set-shifting.

Our findings indicate that white matter inflammation plays a key role in mediating the complex interaction between AD and stroke. As a result, great potential could arise for the use of anti-inflammatory agents to prevent and reduce the cognitive consequences of white matter injury following stroke and AD. These future studies have the potential to hold tremendous clinical importance.

Morning Oral Presentations - 10:30am

Clinical Research: Bradycardia and burn patient outcomes

***Gaurav Talwar**(1,2), Sarah Rehou(1), Marc G. Jeschke(1,3,4)

(1) Ross Tilley Burn Centre, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada
(2) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(3) Division of Plastic and Reconstructive Surgery, Department of Surgery, University of Toronto, Toronto, Ontario, Canada
(4) Department of Immunology, Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada

Severe burn injury causes hemodynamic derangement and cardiac stress. This is marked by a decrease in cardiac output and stroke volume, followed by compensatory tachycardia. Cardiac stress is associated with high rates of morbidity. However, the effect of relative bradycardia, defined in this study as an average heart rate ≤85bpm for ≥8 consecutive hours, remains unknown. The objective of this study is to evaluate the incidence and prognostic significance of relative bradycardia during the acute phase post-burn. It is hypothesized that episodes of extended bradycardia may be associated with poorer outcomes.

We included all patients (age >18 years) admitted to the Ross Tilley Burn Centre between 2006 and 2016 for treatment due to a burn ≥15% total body surface area (n=476). Outcomes including hemodynamic measurements, volume of fluid resuscitation, cardiac agents, multi-organ dysfunction scores, length of hospital stay and survival were recorded for the first 96 hours post-burn. Data were analyzed using the Student's t-test, Mann-Whitney U test, Fisher's exact test and multivariable logistic regression adjusting for patient and injury characteristics.

Preliminary analysis of 130 patients is presented. The mean age of the relative bradycardia group (n=46) and comparison group (n=84) was 56 years (SD=16) and 45 years (SD=15) respectively. There were no significant differences in other demographic variables and in mortality rate (13%). Median length of hospital stay and mean length of hospital stay per %TBSA were significantly lower ($p<0.05$) in the relative bradycardia group (29 days IQR=16-37, 1.0 day/%TBSA SD=0.5) than the comparison group (44 days IQR=22-62, 1.3 days/%TBSA SD=0.8).

Contrary to what was hypothesized, relative bradycardia in burn patients during the acute phase post-burn seems to have better outcomes, including a shorter length of hospital stay. Our findings indicate that relative bradycardia may be a more effective response post-burn in comparison to a state of tachycardia.

Morning Oral Presentations - 10:45am

Community Research: Hepatitis C knowledge and training among people working in the alcohol and other drugs sector

***Eilish Scallan** (1, 2), Robert Calder (3), Carla Treloar (2), Kyle R. Dyer (3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Centre for Social Research in Health, UNSW, Sydney, Australia
(3) Institute of Psychiatry, Psychology & Neuroscience, King's College London, England

In the United Kingdom, the majority of hepatitis C (HCV) infection is attributable to the injection of drugs. While alcohol and other drug (AOD) services are effective tools for linking people who inject drugs (PWID) to care, further examination of workforce training and knowledge is needed.

A survey examining workforce training needs was distributed to employees of five AOD treatment providers in the United Kingdom.

Of 115 participants, 71 (62%) had received no HCV training or had expressed desire for additional training. Participants demonstrated a range of low (25%), medium (44%) and high (31%) knowledge about HCV. Forty percent of participants incorrectly reported that there is no curative treatment for HCV. Knowledge of the HCV cure was associated with a longer time working in the field [AOR = 1.11, 95% CI (1.02, 1.20)] and not carrying a caseload [AOR = 4.85, 95% CI (1.88, 12.49)].

Overall, knowledge scores were variable. There are significant gaps in knowledge and training among AOD workers. A high number of participants were unaware of the curative treatment for HCV. Targeted training is required for the AOD workforce to ensure that people living with HCV are effectively linked to care.

Afternoon Oral Presentations – 3:00pm

Clinical Research: Association between the use of surrogate measures in pivotal trials and health technology assessment decisions: A retrospective analysis of NICE and CADTH reviews of cancer drugs

***Ashlyn Pinto**(1,2), Huseyin Naci(1), Emilie Neez(1), Elias Mossialos(1)

(1) LSE Health, Department of Health Policy, London School of Economics and Political Science, London, UK
(2) Department of Medicine, McMaster University, Hamilton, Ontario, Canada

Drug licensing agencies face pressure to expedite the approval of new cancer medicines. A common strategy to accelerate approval is to use surrogate measures of clinical benefit, despite their debated validity. This study assessed whether using surrogate versus clinical endpoints in pivotal trials of cancer drugs was associated with health technology assessment (HTA) recommendations in England (National Institute for Health and Care Excellence – NICE) and Canada (Canadian Agency for Drugs and Technologies in Health - CADTH).

Cancer drug market authorisations from 2012-2016 were categorized by demonstrating benefit on overall survival (OS), progression-free survival, disease response, or having no comparator. Approvals were analysed by benefit category and HTA recommendation. The association between benefit (OS versus surrogate) and a positive recommendation was examined using descriptive statistics and linear probability models controlling for unmet need, orphan designation, and cost-effectiveness.

Of 42 cancer indications that received a positive recommendation from NICE, 15 (36%) demonstrated OS benefit. Cancer indications with OS benefit were less likely to receive a positive recommendation from NICE than those without ($p=0.0398$). In linear probability models, availability of OS benefit was no longer associated with a different recommendation from NICE ($p=0.318$). Cost-effective cancer drugs had a 55.6% [95% CI: 38.9% to 72.3%] higher probability of receiving a positive recommendation from NICE than those that were not. In Canada, 15 of 37 (41%) cancer indications that received a positive recommendation showed OS benefit. There was no detectable association between surrogate measures and CADTH recommendations based on descriptive statistics ($p=0.8356$) or linear probability models.

Surrogate endpoints, unmet need, orphan status, and cost-effectiveness did not explain CADTH recommendations. When cost-effectiveness was considered, clinical trial measures were not associated with NICE recommendations. This raises questions about assumptions made in cost-effectiveness models, as multiple studies have demonstrated the lack of a relationship between surrogate and clinical endpoints.

Afternoon Oral Presentations - 3:15pm

Quality Improvement: Getting youth and families "Back on Track": a retrospective chart review of patients in McMaster's Back on Track Program for children living with type 1 diabetes.

***Kristen Salena** MSc (1), Hilary Swanson MSc NP-PHC (2), Leigh Drong MSW CDE (2), Joanne Gibson RD CDE (2), Burke Baird MD FRCPC (2), Karen McAssey MD MEd FRCPC (1,2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Department of Pediatrics, McMaster Children's Hospital, Hamilton, Ontario, Canada.

Back on Track (BoT) is a multidisciplinary health care program offered at McMaster Children's Hospital in Hamilton, Ontario, Canada. The program is tailored towards children with T1DM who have difficulty reaching their target glycosylated hemoglobin (HbA1c) levels and, inherently, achieving optimal glycemic control.

A retrospective chart review was conducted to determine patient demographics and health-related outcomes. The sample included a cohort of youth enrolled in the BoT program from January 1, 2017 to December 31, 2017. This sample (n = 54) included both children who were newly referred to the program and children who were continuing in the program during the specified timeframe. Two reviewers accessed medical records using Patient Link, an electronic medical record system used in many outpatient pediatric clinics at McMaster Children's Hospital. Descriptive statistics were generated for each of the measured variables.

The mean age at diabetes diagnosis was 8.66 years (0.43-15.81) and youth had a mean diabetes duration of 2.2 years (0-9.8) before referral. 30 participants (55.6%) were male and 24 (44.4%) were female. 43 participants were on multiple daily injections of insulin (MDI), 10 participants were on insulin pump therapy and 1 patient was on three daily injections of insulin. On average, each youth had 5 visits to the program and spent 10.6 months in the program before discharge. The average number of visits per patient in the 6 months before starting BoT was 2.43, whereas 6 months after starting BoT it was 4.94. The average HbA1c before beginning the BoT program was 11.4% (7.7 - 15.1). 6 months after starting BoT, the average HbA1c was 10.9% (6.5 - 14). There were 14 episodes of diabetic ketoacidosis (DKA) in the 6 months prior to starting the program and there were 7 episodes 6 months after participating in the program. 23 youth (42.6%) experienced parental separation or divorce. Child protection services were involved in care of 11 youth (20.4%) participating in the program.

Understanding patient demographics and outcomes are important components of health care program quality improvement. This retrospective chart review provided a snapshot of the patient population accessing BoT programming. It is important to know the characteristics of patients who are more likely to have difficulties with glycemic control, such that these patients can be targeted for more intensive programming. In this way, health care related outcomes can be improved and long-term sequelae can be prevented.

Afternoon Oral Presentations - 3:30pm

Basic Science: Staphylococcus aureus leukocidins target endothelial DARC to cause lethality in mice

Ashira Lubkin(1), Warren L. Lee(2,3), Francis Alonzo 3rd(1), Jason Aligo(4), Matthew Keller(1,5), Changsen Wang(2), Natasha M. Girgis(1), Tamara Reyes-Robles(1), Aidan O'malley(1), Rita Chan(1), Junjie Mei(6), Peter Buckley(4), Nikollaq Vozhilla(1), Marilyn Vasquez(1), ***Johnny Su**(2), Eric Chen(7), Patricia Martin(5), Cynthia Loomis(8), Russell Vance(7), G. Scott Worthen(6), Anthony Simon Lynch(4), Daniel Weinstock(4), P'ng Loke(1), Ken Cadwell(1,5), and Victor J. Torres(1)

(1) Department of Microbiology, New York University School of Medicine, New York, NY 10016, USA.
(2) Keenan Research Centre, St Michael's Hospital, 30 Bond Street, Toronto, ON, Canada, M5B 1W8
(3) Institute of Medical Sciences, University of Toronto, Toronto, ON, Canada.
(4) Janssen Research & Development LLC., 1400 McKean Road, Spring House, PA 19477, USA.
(5) Kimmel Center for Biology and Medicine at the Skirball Institute, New York University School of Medicine, New York, NY 10016, USA.
(6) Division of Neonatology, Children's Hospital of Philadelphia, Philadelphia, Pennsylvania, USA.
(7) Department of Molecular and Cell Biology, University of California, Berkeley, Berkeley, CA 94720
(8) Office of Collaborative Sciences, NYU School of Medicine, New York, New York, USA

Staphylococcus aureus is a Gram-positive bacteria that infects skins, lung and soft tissues. Despite the high mortality rates associated with S. aureus bacteremia, the molecular mechanisms for its lethality are unclear. S. aureus employs a large repertoire of membrane-damaging toxins that target host cells. Among these, the bi-component, pore-forming leukocidins are the most complex. Two of these leukocidins, Leukocidin ED (LukED) and Hemolysin gamma AB (HlgAB), are necessary and sufficient to cause lethality of mice upon intravenous delivery in both infection and toxin challenge models. Given the importance of these leukocidins, we are interested in elucidating the mechanism by which they cause derangement in vascular fluid distribution and rapid death.

LukED and HlgAB together target five chemokine receptors: CXCR1, CXCR2, CCR5, CCR2, and DARC1. We challenged mice deficient in each of these receptors to determine which were necessary for lethality. This revealed that lethality requires DARC (Duffy Antigen Receptor for Chemokines) on non-hematopoietic cells, likely endothelial cells. Next, to determine whether vascular endothelial damage could be directly mediated by the toxins, we addressed whether endothelial cells are susceptible to leukocidins in vitro. Since DARC is not expressed by endothelial cells in culture, we transfected primary human pulmonary microvascular endothelial cells (HPMECs) with a plasmid expressing GFP-DARC. Transfection of DARC rendered HPMECs susceptible to leukocidin-induced membrane damage.

Whole blood exposed endothelial cells are susceptible to HlgAB. Importantly, the increased susceptibility to HlgAB caused by whole blood exposure is abrogated when DARC expression is depleted by siRNA. These data show that leukocidins directly target primary human endothelial cells that express DARC.

LukED and HlgAB directly injure primary human endothelial cells, hence endothelial cells are an important cellular target for S. aureus bi-component leukocidins and have an unexpected role in pathogenesis.

Afternoon Oral Presentations – 3:45pm

Community Research: Assessing capacity to serve sex workers in Hamilton: a needs assessment

***Ashley Warnock** (1), ***Shannon Brent** (1), Dr. Robin Lennox (2)

(1) Department of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) McMaster Family Practice, Hamilton, Ontario, Canada

Hamilton is home to a population of women who work in the street-level sex trade, yet there is a paucity of knowledge on the lives of these individuals, including their health and healthcare needs. Studies performed in other Canadian cities describe street-level sex workers as a highly marginalized population with prevalent comorbidities and much higher morbidity and mortality relative to the general population. Little is known about this population of women in Hamilton except that they are the "most vulnerable of the vulnerable", being very difficult to care for since they tend not to access traditional forms of healthcare. In 2015, a local community group recognized that the healthcare needs of sex workers are unmet in our community and recommended that further investigation be done to determine how these needs can be addressed. Thus, the purpose of this research is to determine how to provide better access and patient-centred care to women that work in street-level sex work, while improving health outcomes and quality of life for this at-risk population. Through this study we will also further our understanding of this hidden group and, specifically, determinants of health that influence their health outcomes.

Using a community-based, inductive approach, we will collect both quantitative and qualitative data using semi-structured questionnaires and interviews from women with experience working in the street-based sex trade. We will engage peers with lived experience to participate in the process, including leading the interviews. Study results will be disseminated to the community of Hamilton through public forums, social media, and scholarly publication.

This project is still in its development, so we do not have results at this time, but will present on findings from the literature that are guiding our research.

Afternoon Oral Presentations – 4:00pm

Basic Science: Development of an Anthropomorphic Dynamic Heart Phantom

***Sherif Ramadan** (1,5), Narinder Paul(1,4), and Hani E. Naguib(1-3)

(1) Institute of Biomaterials and Biomedical Engineering, University of Toronto, Toronto, Ontario, Canada
(2) Department of Mechanical & Industrial Engineering, University of Toronto, Toronto, Ontario, Canada
(3) Department of Materials Science & Engineering, University of Toronto , Toronto, Ontario, Canada
(4) Joint Department of Medical Imaging, Peter Munk Cardiac Centre, University Health Network, University of Toronto, Toronto, Ontario, Canada
(5) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada

Dynamic anthropomorphic heart phantoms are a developing technology which offer a methodology for optimizing current computed tomography coronary angiography techniques. This work focuses on the development of a synthetic myocardial tissue material that can be utilized in a dynamic phantom. The replication of mechanical and CT properties will allow the material to mimic the motion profile of the heart throughout a cardiac cycle.

First, the mechanical properties of porcine/ovine myocardial tissue were studied to determine the static (young's modulus) and viscoelastic (storage/loss modulus) properties of the tissue. A Bis(2-ethylhexyl) phthalate (DEHP) plasticizer/PVC material was then developed and validated to mimic myocardial tissue utilizing tensile testing, dynamic mechanical analysis and computed tomography. The material was then molded to create a heart/coronary artery model which can be integrated with a dynamic heart phantom in a cardiac CT simulation scan.

The mechanical properties of ovine/porcine myocardial tissue were found to be a mean = 0.05/.06 MPa, SD = 0.02/0.03 MPa. The storage/loss modulus varied from = 0.02/0.003 MPa at 0.5 Hz (30 BPM) to 0.04/0.008 MPa at 3.5 Hz (210 BPM). The developed DEHP-PVC material was then tested to find a modulus of .069MPa, a storage/loss modulus =0.02/0.003 MPa at 0.5Hz to 0.04/0.008 MPa at 3.5Hz. Finally, the CT attenuation was found to be 40-100HU based on the kVp utilized. The material was then successfully molded and integrated with a dynamic phantom apparatus.

Through this study it is seen that the developed phantom material provides a dynamic simulation to myocardium and can be used as a plaque analysis tool. The replication of cardiac motion in a controlled manner will allow for the optimization of CT scanning through development of new scanning algorithms and protocols. Ultimately this can lead to ultra-high resolution, ultra-low dose CT scans of the heart and coronary arteries.

Afternoon Oral Presentations - 4:15pm

Clinical Research: Oncologic Outcomes in Prone Compared to Lithotomy Positioning During Abdominoperineal Resection: A Systematic Review and Meta-Analysis

***Tyler McKechnie** BSc (1,2), Yung Lee BHSc (1,,2), Jeremy E. Springer MD MSc (2), Aristithes G. Doumouras MD MPH (2,3), Dennis Hong MD MSc (2,3), Cagla Eskicioglu MD MSc (2,3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada.
(2) Division of General Surgery, Department of Surgery, McMaster University, Hamilton, Ontario, Canada.
(3) Division of General Surgery, Department of Surgery, St. Joseph Healthcare, Hamilton, Ontario, Canada.

Abdominoperineal resection (APR) is the primary surgical approach to low rectal cancers. Both prone and lithotomy patient positioning during the perineal dissection are currently acceptable approaches. There is no consensus on whether patient positioning has an impact on operative and oncologic outcomes. The objective of this review is to compare the perioperative and long-term oncologic outcomes between prone and lithotomy patient positioning.

Search of Medline, EMBASE, Web of Science, CENTRAL, PubMed and ClinicalTrials.gov databases was performed. Articles were eligible for inclusion if they compared prone and lithotomy positioning for the perineal portion of APR for rectal cancer in one of the primary outcomes. Quality of included studies were assessed using Newcastle-Ottawa Scale and Cochrane Risk of Bias Tool.

Nine studies with 888 patients in the prone group and 897 in the lithotomy group were included. Compared to lithotomy position, prone position had significantly lower rate of positive circumferential resection margin (CRM) involvement (RR 0.66, 95% CI 0.44 to 1.00, P=0.05) and perforation rate (RR 0.50, 95% CI 0.32 to 0.79, P=0.003). Prone position also had a significantly shorter operative time than lithotomy position (MD -45.20, 95% CI -63.03 to 27.36, P<0.00001). Positioning did not affect 5-year overall survival or local and distal recurrence.

Prone positioning may lead to lower rates of perforation and CRM involvement than lithotomy positioning in APR. Additionally, it may lead to shorter operative time. Larger randomized studies are required to confirm the superiority of prone positioning in APR and examine the difference in long-term outcomes.

Morning Poster Presentations - Basic Science

A potential mechanism underlying muscle pain in statin users

***Andrew W. Cao** (1), Irena Rebalka (1), Jonathan Schertzer (2), Mark Tarnopolsky (3), Thomas Hawke (1)

(1) Department of Pathology and Molecular Medicine, McMaster University, Hamilton, Ontario Canada
(2) Department of Biochemistry and Biomedical Sciences, McMaster University, Hamilton, Ontario, Canada
(3) Department of Medicine, McMaster University, Hamilton, Ontario, Canada

Myalgia is the most common side effect associated with statin therapy, yet the underlying mechanisms of statin-induced myalgia are unknown. Reactive oxygen species (ROS) are increased in skeletal muscle following statin treatment and are known to initiate signalling cascades that induce expression of system xC-, a cell membrane antiporter that typically imports cystine while exporting glutamate. Glutamate has been implicated in nociception, therefore, we hypothesized that increased system xC- activation in response to ROS would lead to a rise in extracellular glutamate levels and concomitant nociceptor activation leading to myalgia. Thus, our aim was to investigate system xC- as a potential mechanism underlying statin-induced muscle pain.

C2C12 murine myotubes were treated with either atorvastatin (7.5uM), combination atorvastatin and alpha tocopherol (100uM; antioxidant molecule) or combination atorvastatin and sulfasalazine (20uM; system xC- inhibitor-). Additionally, human myotubes were treated with either atorvastatin (7.5uM) or combination atorvastatin and sulfasalazine (40uM).

Atorvastatin treatment alone in C2C12 myotubes increased expression of system xC- subunit xCT by 155% ($p<0.05$) as compared to controls. Accordingly, extracellular glutamate was increased 187% ($p<0.05$) in comparison to control treated C2C12 myotubes. Sulfasalazine co-treatment in C2C12 myotubes resulted in similar increases in xCT protein content but extracellular glutamate was normalized to control concentrations. Alpha-tocopherol co-treatment was also able to attenuate increases of extracellular glutamate in C2C12 myotubes. In primary human myotubes, statin treatment increased extracellular glutamate concentrations by 143% ($p<0.05$) and this effect was attenuated by sulfasalazine co-treatment.

The success of system xC- inhibition and antioxidant treatment in decreasing glutamate release both validates the experimental system and implicates system xC- as a primary contributor to extracellular glutamate in myotubes. These findings lay the mechanistic framework for future in vivo investigations into statin induced myalgia. Characterization of this pathway presents potential targets for future pharmaceutical interventions in patients experiencing statin-induced myalgia.

Morning Poster Presentations - Basic Science

Evaluation of the efficacy of a peptide mimetic therapeutic on a human thioredoxin scaffold for the treatment of respiratory syncytial virus

***Christopher K.W. Chiang** (1), James Mahony (2)

(1) Michael G. DeGroote School of Medicine – Waterloo Regional Campus, McMaster University, Kitchener, Ontario, Canada
(2) Michael G. DeGroote Institute for Infectious Disease Research, Faculty of Health Sciences and Department of Pathology and Molecular Medicine, McMaster University, Hamilton, Ontario, Canada

Respiratory syncytial virus (RSV) is one of the leading causes of acute lower respiratory tract infection and childhood hospitalizations worldwide (1, 2). However, there are currently no vaccines or antivirals available to prevent or treat RSV infections. Of the 11 proteins encoded by RSV's negative-sense single-stranded RNA genome, the nucleoprotein, phosphoprotein, and large polymerase interact through well-characterized domains to form the RNA-dependent RNA polymerase complex (3). This polymerase complex is essential for viral replication and virulence, which makes it an excellent antiviral target. Previous studies have shown that the nucleoprotein-phosphoprotein interaction of the polymerase complex can be disrupted by synthetic peptides of the last 21 C-terminal amino acids of the phosphoprotein ($P_{220-241}$) (4). The Mahony laboratory has previously demonstrated that $P_{220-241}$ conjugated to an Escherichia coli maltose binding protein (MBP) and HIV-1 Tat cell penetrating peptide (CPP) could inhibit up to 90% of RSV A replication in vitro. However, the bacterial derived MBP is immunogenic. This study builds on these findings by developing and evaluating the efficacy of a $P_{220-241}$ peptide mimetic conjugated to human thioredoxin (hTrx) carrier protein compared to $P_{220-241}$ on MBP.

Inverse PCR and In-Fusion® cloning were used to clone a hTrx-$P_{220-241}$ plasmid, which was then expressed as a recombinant protein and purified by affinity chromatography for functional analysis. HTrx-$P_{220-241}$ was shown to specifically interact with RSV nucleoprotein in a glutathione S-transferase pulldown assay and also be able to successfully enter LLC-MK2 cells. However, upon challenge with RSV A, LLC-MK2 cells pre-incubated with increasing concentrations of hTrx-$P_{220-241}$ did not inhibit RSV A replication when assessed by indirect immunofluorescence microscopy.

In this study, a $P_{220-241}$ peptide mimetic attached to human thioredoxin did not demonstrate an ability to significantly reduce RSV replication in vitro compared to $P_{220-241}$ on MBP.

Morning Poster Presentations - Basic Science

Investigating amyloid precursor protein signaling and internalization using antibody-coated beads in a mouse neuroblastoma cell line

***Connor Lewicki(**1), Dr. Stephen Pasternak(2)

(1) Department of Physiology and Pharmacology, Western University, London, Ontario, Canada
(2) Department of Clinical Neurological Sciences, Western University, London, Ontario, Canada

Alzheimer's disease is a progressive neurological disorder with debilitating personal and societal consequences. The amyloid precursor protein (APP) is the predecessor of β-amyloid, a small peptide thought to be essential to Alzheimer's pathology. The production of β-amyloid depends on processing inside the cell following internalization from the cell surface. A recently discovered but poorly understood mechanism of APP internalization is macropinocytosis. This study sought to qualitatively identify macropinocytosis in cells using a novel cell biology technique.

N2A mouse neuroblastoma cells were transfected in vitro with APP and one of several fluorescence-tagged proteins implicated in macropinocytosis. Protein G beads coated with fluorescent and APP-binding antibodies were introduced to the cells to bind for one hour before being fixed. Confocal microscopy was performed to look for evidence that the cells responded to the beads in a manner characteristic of macropinocytosis.

Beads were repeatedly found to bind to cell membranes. Fluorescent membrane protein-transfected cells provided evidence of membrane ruffling. Cells with the fluorescence-tagged signaling protein Arf6 showed evidence of protein accumulation at the site of bead contact on the cell membrane. Cells with each fluorescent protein under study showed evidence of bead internalization.

Antibody-coated beads provide a novel technique in the study of APP macropinocytosis and this preliminary imaging support their use. Better understanding of APP processing may yield therapeutic targets to combat Alzheimer's disease. Future studies should expand the use of beads to better characterize internalization signaling processes.

Morning Poster Presentations - Basic Science

N-acetyl glucosamine analogues to probe polymerizing glycosyltransferases

***Daniel J. Lazzam**, Adam Forman, Mark Nitz

University of Toronto

Biofilm-forming bacteria present serious problems in many areas of society, from health care to the food industry (1). The complex, protective biofilm matrix that makes biofilms so difficult to eradicate is composed largely of polysaccharides, one of the most significant examples of which is Poly N-acetyl Glucosamine (PNAG) (2).

In an attempt to learn more about the formation of this polymer, azide-tagged N-acetyl glucosamine analogues were synthesized and used as substrates for pgaCD, the enzyme system responsible for PNAG formation.

Our results indicate that pgaCD likely forms PNAG through addition to the non-reducing end of the growing polymer and illustrate ways of making polysaccharides like PNAG more tractable and easily studied, in addition to suggesting myriad future directions of research.

In conclusion, our results suggest promising avenues to design drugs targeting biofilms, as well as methods for further investigation into biofilm structure and biosynthesis.

Morning Poster Presentations - Basic Science

Green Templating of Ultraporous Cross-Linked Cellulose Nanocrystal Microparticles

***Daniel Levin** (1), Sokunthearath Saem (1) , Daniel A. Osorio (2), Aline Cerf (3), Emily D. Cranston (2) , and Jose M. Moran-Mirabal (1,2)

(1) Department of Chemistry and Chemical Biology, McMaster University, 1280 Main St. W., Hamilton, Ontario L8S 4M1 Canada
(2) Department of Chemical Engineering, McMaster University, Hamilton, Ontario L8S 4M1, Canada
(3) LAAS-CNRS, Université de Toulouse, CNRS, INSA, UPS, 7 Avenue du Colonel Roche, 31400 Toulouse, France

Cellulose nanocrystals (CNCs) are rigid rodlike nanoparticles that are derived from natural cellulose. Their high surface area, mechanical strength, and noncytotoxicity have elicited interest in their use for various applications, including composite and construction materials, cosmetic, food, and biomedical products. However, few methods exist to control the morphology and dimensions of assembled CNC structures in the micrometer range.

ere, we use water-in-oil droplet microfluidics to template uniform spherical CNC droplets in a nontoxic and sustainable manner. Subsequent evaporation of the water within the droplets promotes the chemical cross-linking of surface-modified CNCs, resulting in ultraporous and flexible micrometer-sized particles.

Changing the size of the microfluidic channel or the concentration of the CNC suspension results in microparticles with tunable sizes. The microparticles swell in polar solvents, with larger swelling observed for microparticles fabricated from less-concentrated CNC suspensions. While swelling is pH-independent, it is impacted by ionic strength for microparticles with low cross-link densities. Scanning electron microscopy reveals that the microparticles have macropores and mesopores, supporting a large specific surface area.

These porous microparticles have potential for a range of applications, such as drug delivery or sorption agents, or as biodegradable beads for use in cosmetic and food applications.

Morning Poster Presentations - Basic Science

Sierra-local: a lightweight standalone application for HIV-1 drug resistance prediction

***Jasper C Ho**(1,2), Garway T Ng(2), Mathias Renaud(2), Art FY Poon (2,3,4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada.
(2) Department of Pathology and Laboratory Medicine, Western University, London, Ontario, Canada.
(3) Department of Microbiology and Immunology, Western University, London, Ontario, Canada.
(4) Department of Applied Mathematics, Western University, London, Ontario, Canada.

Genotype-based computational predictions of HIV-1 drug resistance are an important component of the routine clinical management of HIV-1 infection at treatment initiation and virologic failure. Current interpretation systems are remotely hosted and can predict susceptibility and resistance to modern antiretroviral therapy from patients' HIV-1 nucleotide sequences according to genotype-phenotype associations determined by expert consensus. However, these unsecured systems may compromise health providers' multifaceted obligations to data security and personal health information confidentiality. This project describes 'sierra-local', an open-source implementation of the widely-used Stanford HIVdb genotypic resistance interpretation system (Sierra), which aims to resolve the ethical, legal, and infrastructure issues associated with remote computing of HIV-1 resistance predictions.

We developed sierra-local, an open-source local Python implementation of HIVdb's sequence alignment, mutation classification, sequence trimming and subtyping, validation, and resistance scoring pipeline. A predetermined dataset was used to validate the performance and concordance of sierra-local against HIVdb. These data comprised of genotype-treatment correlation datasets for all complete HIV-1 protease, reverse-transcriptase, and integrase sequences obtained from the Stanford HIV Drug Resistance Database on May 7 2018 (N=226,702), supplemented with seven population-representative Genbank datasets representing the global diversity of HIV-1 group M subtypes A, B, C, D, and several circulating recombinant forms (N=1,006).

Sequence resistance predictions were concordant in 226,696 sequences (99.997%) in the Stanford dataset and 1,006 sequences (100%) in the Genbank dataset. Analyses demonstrated a three-fold performance [sequence/s] improvement of sierra-local versus HIVdb across all HIV-1 pol genes.

Our implementation addresses the identified ethical, legal, and professional obligations of the healthcare provider, promoting precise patient- and privacy-conscious management of HIV-1 infections in line with current expert opinion. Additionally, this system aids the data-oriented study of HIV-1 resistance by virtue of its network independence and high performance.

Morning Poster Presentations - Basic Science

Generation of single splice variant mutant Caenorhabditis elegans using CRISPR/Cas9 genome editing tool.

***Leanne S. Kim** and John A. Calarco

Department of Cell and Systems Biology, University of Toronto, Toronto, Ontario, Canada

Alternative splicing (AS) is a tightly regulated co/post-transcriptional process that contributes to cellular diversity and animal development. Translating Ribosome Affinity Purification (TRAP)-sequence studies in Caenorhabditis elegans have revealed hundreds of tissue-specific splice variants. Despite the distinct splicing patterns, the roles of these variants in development remain largely unknown, in part due to lack of systematic molecular tools to study phenotypic consequences of AS. We aimed to adapt the CRISPR/Cas9 genome editing tool to generate recombinant lines that expressed a single splice variant at the genetic locus of interest.

Six genes (dyn-1, dpy-23, icln-1, klc-2, arx-3, atx-2) were selected based on their degree of tissue-specific splicing patterns from the TRAP-sequence studies and their roles in the development described in the literature. Previously, the rate limiting step of such genome editing studies of C. elegans have been the polymerase chain reaction (PCR)-genotyping-based screening of possible recombinant lines from a pool of microinjected animals. Here we demonstrate the integration of dual-marker cassette in the repair template vector to identify recombinant lines in a timely fashion.

Following the successful generation of recombinant line of dpy-23, PCR-genotyping of edited junction showed an indel mutation adjacent to the cleavage induced by the guide RNA-Cas9 complex. This raises the possibility of editing events of the repair template vector by the guide RNA-Cas9 complex, thereby resulting in generation of indel mutation by non-homologous end joining (NHEJ).

For future CRISPR/Cas9 studies, we recommend introducing synonymous mutations within the repair template vector recognized by the guide RNA in order to prevent editing events of the repair template vector. Nonetheless, the development of the CRISPR/Cas9 editing tool to study AS will be instrumental in unravelling the transcript diversity and its role in development.

Morning Poster Presentations - Basic Science

The impact of napping on the consolidation of clinically-relevant information: a comparison of depressed and healthy individuals

***Lilian J.C. Laferriere**(1), Dr. Hans C. Dringenberg(2), Dr. Christopher Bowie(2)

(1) Department of Medicine, McMaster University, Hamilton, Ontario Canada
(2) Department of Psychology, Queen's University, Kingston, Ontario, Canada

In addition to mood symptoms, individuals with Major Depressive Disorder (MDD) often experience comorbid cognitive impairments that affect multiple domains including attention and memory, although the exact contexts in which these defects emerge remains unclear (Rock, Roiser, Riedel, & Blackwell, 2014). Furthermore, the benefits of sleep on memory consolidation are well documented (Rash & Born, 2013), but have yet to be thoroughly investigated in individuals from clinical populations. The purpose of this study was to determine whether participants with depression would demonstrate memory impairments for depression-relevant information in comparison to healthy controls, and whether their recollection of this information could be enhanced by a brief nap.

Participants were brought in for two appointments: the first to gather general demographic and baseline cognitive data, the second to administer a novel clinical memory test before and after a 60-minute delay. During the delay, participants either napped or remained awake.

Napping was found to provide a medium-sized memory benefit that did not differ between the depressed or healthy control groups, although the effect was not statistically significant. Interestingly, contrary to my hypothesis, depressed participants recalled the depression-associated story significantly better than healthy controls regardless of the experimental manipulation.

These results contribute towards a greater understanding of how cognitive functions are modulated by context in depression, and how sleep stages may interact with memory consolidation. Future studies could explore the potential applications of this information for enhancing patient recall of relevant clinical information following psychotherapy.

Morning Poster Presentations - Basic Science

The influence of microenvironmental factors on in vitro effector function of engineered T cells against multiple myeloma

***Michael Sun**, Ksenia Besverbnaya, Jonathan Bramson

Department of Pathology and Molecular Medicine, McMaster Immunology Research Centre, McMaster University, Hamilton, Ontario, Canada

Multiple myeloma is an incurable plasma cell cancer that forms lesions within bone. Conventional therapies inevitably result in relapsed/refractory disease, in part due to drug resistance and improved survival conferred by components of the bone marrow microenvironment. Ongoing clinical trials for adoptive cell transfer of BCMA-specific engineered T cells are promising but often only induce a partial response in patients.

To better understand how microenvironmental factors can contribute to multiple myeloma immune evasion, we investigated the effects of type I collagen and HS-5 bone marrow stromal cells on several functional measures of primary T cells transduced with either CAR or TAC receptors specific for BCMA. Cytotoxicity was assessed via T cell killing of luciferase-expressing multiple myeloma cells, and cytokine production and proliferative capacity were measured by flow cytometry following cell-based stimulation.

Collagen gel, but not collagen-coated wells, inhibited T cell killing at lower effector to target ratios, and neither condition had a significant impact on cytokine production in either CD4+ or CD8+ populations. Conversely, T cells and multiple myeloma co-incubation with HS-5 cells led to a drop in TNF-α production but not cytotoxicity. Both collagen gel and HS-5 cells decreased T cell proliferation, with HS-5 cells having a greater inhibitory effect. Fluorescence microscopy of collagen gel suggests physical separation as a mechanism for the observed effects of collagen.

Further investigation into the mechanisms through which collagen, stromal cells, and other extracellular matrix factors can modulate engineered T cell function will inform future strategies to enhance the efficacy of these therapies.

Morning Poster Presentations - Basic Science

Gene expression profile is different between intact and enzymatically digested equine articular cartilage

***Rishi Sharma**, Sarah Lepage, David Dukoff, Leanne Stalker, Jon LaMarre, Thomas G. Koch

Department of Biomedical Sciences, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada

Assessment of cartilage gene expression is fundamental to many aspects of cartilage biology: development, disease progression and repair processes, as well as tissue engineering. Unfortunately, isolation of good quality RNA from articular cartilage remains a key challenge to investigators. Low chondrocyte content (1-5% of tissue mass), highly cross-linked extra-cellular matrix (ECM) molecules, and a high proteoglycan content1 make it particularly difficult to extract RNA from cartilage tissue using routine procedures. To combat this, ECM is often enzymatically digested to release chondrocytes, increasing RNA yield2. However, digestion of cartilage may alter gene expression. Bovine articular cartilage subjected to varying collagenase digestion times showed variations in key genes such as COL2A1, ACAN, and GAPDH3. Similar findings have been reported in bovine meniscus tissue, where gene expression patterns more characteristic of a fibrocartilage phenotype were observed in enzymatically digested versus intact tissue4. Therefore, RNA isolation from enzymatically-digested cartilage may not be representative of real-time chondrocyte gene expression in vivo, though a direct gene expression comparison between intact and digested articular cartilage has yet to be performed.
In this study, we evaluated the expression of cartilage-associated genes from intact and digested equine articular cartilage from the fetlock joint. We hypothesized that enzymatic digestion would result in differences in cartilage-associated gene expression compared to non-digested cartilage.

Equine articular cartilage samples were collected from the fetlock joint of cadaver limbs of adult horses. Cartilage samples were either retained for direct isolation or digested immediately after harvesting. RNA was subsequently isolated using a variety of isolation kits from both sample types. Gene expression of SOX9, COL1A2, COL2A1, COLX, and ACAN was assessed in RNA samples using qRT-PCR.

Digested cartilage from two distinct regions showed a significant decrease in the expression of COL1A2, COL2A1, and ACAN compared to intact cartilage, whereas COLX expression was increased in digested cartilage in one region only (non-weight bearing region).

Thus, enzymatic digestion of equine cartilage significantly impacts gene expression profile. We conclude that while RNA isolation from intact cartilage is more technically difficult, determination of gene expression should be conducted on intact cartilage if true representation of the in vivo processes is sought.

Morning Poster Presentations - Basic Science

Caloric restriction, exercise, or both for weight loss in adults aged 18-50: a systematic review and meta-analysis

***Wajahat Syed**(1), Terry Thach(1), Chris Hitchcock(2), Henry Kwon(3), Huda Gomaa(4), Regina El Dib(5), Ryan Peters(1), Ali Rizvi(1), Sabrina Sibbald(1), Kevin Kim(1), Suhail Agarwal(1), Gordon Guyatt(6), Bradley Johnston(7)

(1) McMaster University, Hamilton, ON, Canada
(2) Hitchcock Consulting, Oakville, ON, Canada
(3) Wayne State School of Medicine, Detroit, Michigan, USA
(4) Department of Pharmacy, Tanta Chest Hospital, Tanta, Egypt
(5) Institute of Science and Technology, Unesp - University Estadual Paulista, São José dos Campos, Brazil
(6) Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, ON, Canada
(7) Department of Community Health and Epidemiology, Faculty of Medicine, Dalhousie University, Halifax, Canada

The prevalence of obesity is increasing in North America. Primary care clinicians are increasingly being called on to prescribe lifestyle interventions for weight loss as preventative care. However, there is great contention as to what constitutes an evidence-based weight loss intervention. This study investigates the relative contributions of caloric restriction versus exercise in weight loss interventions for young individuals.

Our search encompassed terms relating to energy restriction and exercise and was conducted through OVID, Embase, and Cochrane. We included RCTs that assigned overweight (BMI $\geq$ 25) adults (aged $\geq$ 18-50 years) to caloric restriction (CR), exercise (EX), or both (CREX) for weight loss. We are including RCTs that reported weight loss at 3 months follow-up or longer. As a result, we are interested in outcomes reported at time points of 6 $\pm$ 3 months and 12 $\pm$ 3 months. Secondary outcomes included BMI, quality of life, adverse outcomes, interval change in metabolic rate. Subgroups of interest include activeness of intervention, presence of behavioural support, adherence, and risk of bias.

Roughly 15 000 studies were screened and 57 studies were included in the final analysis. Our preliminary data suggest that exercise plays a marginal role in weight loss and that the vast majority of weight loss comes from caloric restriction. The difference in weight loss between CREX and CR is small. The presence of behavioural (group or behavioural) support increases the magnitude of weight loss irrespective of intervention.

Our study provides strong support for caloric restriction as a means for weight loss over exercise alone in overweight or obese individuals aged 18-50. The presence of group support or professional support increases weight loss regardless of intervention. Further reviews are needed to assess caloric restriction-based weight loss using traditionally healthy food choices versus unhealthy food choices.

Morning Poster Presentations - Clinical Science

Delivery of palliative and end of life care to adolescents and young adults diagnosed with advanced stage cancer

***Arielle M. Geist**(1), Jonathan Avery(2), Norma D'Agostino(3), Amirrtha Srikanthan, (5) Sarah Kawaguchi, (6) Ramona Mahtani, (7) Paolo Mazzotta, (8) Pamela Mosher, (9) Camilla Zimmermann, (10) Alisha Kassam, (11) Abha Gupta

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Department of Supportive Care, Princess Margaret Cancer Centre UHN, Toronto, Ontario, Canada
(3) Department of Psychosocial Oncology and Palliative Care, Princess Margaret Cancer Centre UHN, Toronto, Ontario, Canada
(4) Medical Oncology, University of Ottawa, Ottawa, Ontario, Canada
(5) Palliative Medicine, Sinai Health System, Toronto, Ontario, Canada
(6) Palliative Medicine, Sinai Health System, Toronto, Ontario, Canada
(7) Palliative Medicine, Sinai Health System, Toronto, Ontario, Canada
(8) Child and Adolescent Psychiatry, University of Toronto, Toronto, Ontario, Canada
(9) Division of Palliative Care, University Health Network, Toronto, Ontario, Canada
(10) Department of Pediatrics, University of Toronto, Toronto, Ontario, Canada
(11) Department of Pediatrics, University of Toronto, Toronto, Ontario, Canada

Adolescents and young adults (AYA) (defined as 15 to 39 years of age) with advanced cancer are a group for whom providing quality palliative and end of life (EOL) care is challenging due to their stage of life and social development. Previous research illustrates that health care providers (HCP) have a difficult time engaging in palliative and EOL care with AYA due to discomfort and lack of skill. However, AYA-focused palliation is not currently incorporated in standard HCP training. The purpose of this study was to explore the experiences of HCPs involved in care of AYA with advanced cancer to determine what challenges exist, and what supports may be required.

Using a qualitative descriptive design, semi-structured interviews were conducted with oncologists (medical and radiation), palliative care physicians, psychiatrists, and advance practice nurses who care for AYA with advanced cancer. Interviews were transcribed verbatim and analyzed using Braun and Clarke's thematic analysis in combination with constant comparative analysis and theoretical sampling.

Interviews illustrated that providing palliative and EOL care to AYA patients was more tragic. Participants described feeling a sense of loss and sadness knowing they were treating an age group whose dreams were being shattered by a diagnosis of an incurable cancer. This sense of tragedy increased feelings of guilt and failure that more could not be done to help AYA. These emotions impacted how care was provided by creating fear and hesitation around introducing palliative care to AYA because of its association with death and dying.

Despite the sense of tragedy associated with providing care to AYA patients with advanced cancer, clinical practice guidelines for quality EOL and palliative care do not provide AYA specific recommendations. Findings demonstrate that specific guidelines to support HCP are needed to deliver palliative and EOL care to AYA.

Morning Poster Presentations - Clinical Science

Availability of evidence of benefits on overall survival and quality of life of cancer drugs approved by European Medicines Agency: retrospective cohort study of drug approvals 2009-13

Davis C(1), Naci H(2), Gurpinar E(2), Poplavska E(3), ***Pinto A**(2), Aggarwal A(4,5)

(1) Department of Global Health and Social Medicine, King's College London, London, UK
(2) LSE Health, Department of Health Policy, London School of Economics and Political Science, London, UK
(3) Faculty of Pharmacy, Riga Stradins University, Riga, Latvia
(4) Department of Health Services Research and Policy, London School of Hygiene and Tropical Medicine, London, UK
(5) Institute of Cancer Policy, King's College London, London, UK

Before prescription medicines are allowed onto the market, studies must show that benefits outweigh harms. There is concern that benefits offered by new cancer treatments are marginal and not clinically meaningful, despite escalating costs. This study determined the availability of cancer medicines with significant overall survival (OS) or quality of life (QoL) benefit, both at time of approval and in the post-marketing period in Europe.

European Public Assessment Reports were searched to identify cancer indications approved from 2009-2013. Availability and magnitude of OS or QoL data at time of approval and after market entry were extracted from clinical trials. For drugs showing OS benefit, the European Society for Medical Oncology's Magnitude of Clinical Benefit Scale (ESMO-MCBS) was used to assess the clinical value of reported gains in published studies.

From 2009-2013, the EMA approved the use of 48 cancer drugs for 68 indications. At the time of market approval, 24/68 (35%) showed OS benefit and 7/68 (10%) showed improvement in QoL. Of 44 indications that showed no OS evidence at time of market authorization, three (7%) showed OS benefit and five (11%) QoL benefit in the subsequent post-marketing period. Only 35/68 (51%) of post-market cancer indications with EMA approval showed a significant improvement in OS or QoL with a median of 5.4 years' follow-up (min. 3.3 years, max. 8.1 years), while 33 (49%) remained uncertain. Less than half (11/23, 48%) of the indications associated with survival benefit that could be scored with ESMO-MCBS were judged to be clinically meaningful.

Most oncology drugs entered the European market without evidence of OS or QoL. At a minimum of 3.3 years after market entry, there was still no conclusive evidence that these drugs extended or improved life for most indications. When there were survival gains over a comparator, they were often marginal.

Morning Poster Presentations - Clinical Science

Fragility of Statistical Findings in Medicine and Surgery

***Betty Zhang** (1), Dinesh Moro (2), Moin Khan (3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Department of Knowledge Integration, University of Waterloo, Waterloo, Ontario, Canada
(3) Department of Surgery, McMaster University, Hamilton, Ontario, Canada

Clinicians frequently rely on p-values from randomized controlled trials (RCTs) to confirm positive findings and establish causation. However, many RCTs are "fragile" and the addition of only a few events can render results statistically insignificant. Fragility index describe the minimum number of patients who need to change from not having the outcome of interest to having the outcome to turn the trial results from statistically significant to insignificant. Given the rapid uptake of fragility index in recent literature, we designed a review of reviews to compare the fragility index of trials in medicine and surgery.

PubMED, MEDLINE, CENTRAL, and Embase were searched from the database inception date to July 7, 2018 for all reviews calculating the fragility index of clinical trials. Two reviewers independently screened the articles for eligibility and extracted data for analysis. A methodological quality and risk of bias was completed.

Of the 7631 abstracts screened, 21 articles met the inclusion criteria, and 13 were included in the quantitative synthesis. Fragility indices were pooled for 591 studies, enrolling 487,688 patients. The mean fragility index of drug studies was 4.97 (95%CI 3.23, 6.71), physiotherapy/education studies 4.64 (95%CI -0.13, 9.42), interventional procedure studies 3.90 (95%CI 2.37, 5.43), surgical studies 3.87 (1.59, 6.14), and diagnostic imaging/other 3.36 (95% CI 2.37, 4.36). Despite the similarity of fragility indices for medical and surgical studies, the median sample size is 100 patients/study in surgical compared to 127 patients/study in medical studies. Almost half of the studies reported higher number of patients lost to follow-up than its fragility index.

Our review of reviews demonstrates no significant difference in the weighted average of fragility indices of medical and surgical trials, and that most trials are fragile. With increased reporting of fragility index, clinicians have a new descriptive measure to ascertain whether study recommendations are robust.

Morning Poster Presentations - Clinical Science

Rest for concussion in youth: a systematic review

E. Dimitra Bednar* (1), Drew A. Bednar

(1) Health Research Methods, Evidence and Impact Department, McMaster University, Hamilton, Ontario, Canada
(2) Department of Surgery, Division of Orthopaedics, McMaster University, Hamilton, Ontario, Canada

The effects of concussion on the developing brains of children and adolescents are of substantial concern. Complete cognitive and physical rest are recommended to facilitate recovery and to reduce the risk of further injury, but the evidence has not been summarized or evaluated in favour of a specific amount of rest. Prolonged rest may impair recovery time and may have negative ramifications on children's academics and athletics. This systematic review and meta-analysis compared the effect of rest for more than 48 hours to other interventions on clinical recovery from concussion.

The authors searched MEDLINE, CINAHL, Embase, CENTRAL, PyscINFO, and SPORTDiscus for eligible studies. Included articles were randomized controlled trials (RCTs) and prospective cohort studies with patients under 21 years of age that compared the effect of complete rest for at least 48 hours to any other time period on symptom resolution.

Three studies are included in this systematic review: 1 RCT and 2 cohort studies with a total of 233 patients. Meta-analyses found that the time to clinical recovery may decrease by 2.28 days with immediate rest compared to no rest/delayed rest (MD: 2,28, 95% CI: -5.93, 1.38, very low-quality evidence). Meta-analyses also found a decrease of 1.27 days in the time to symptom resolution among patients receiving usual care/no rest compared to the group undergoing rest for more than 48 hours (MD: -1.27, 95% CI: 0.49, 2.05, very low-quality evidence).

Complete rest may reduce the time to clinical recovery but may also increase symptomatology and increase the time to asymptomatic status. It is not clear whether the effects of prolonged rest are clinically significant. This systematic review reports inconclusive evidence on the effectiveness of rest in treating concussion; more RCTs and cohort studies need to investigate and conclude upon rest recommendations for concussion in youth.

Morning Poster Presentations - Clinical Science

Sugammadex in Ontario hospitals: Access and institutional policies

***Jared C. Cohen**(1), Kevin J. Latchford(1,2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON
(2) Department of Anesthesia, Grand River Hospital and St. Mary's General Hospital, Kitchener, ON

Sugammadex is a novel neuromuscular blockade reversal agent which rapidly reverses the effects of the non-depolarizing neuromuscular blocker, rocuronium. Compared to the first-generation neuromuscular blockade reversal agent, neostigmine, sugammadex has a number of superior properties (1,2); however, sugammadex is significantly more expensive per dose compared to neostigmine (~CAD$95 vs $4). Given the high cost of sugammadex, many Ontario hospitals either do not stock the drug, or have specific policies on when the drug may be administered. This study was designed to assess availability of sugammadex in Ontario hospitals, as well as the prevalence and content of institutional policies on its use.

We designed a survey assessing the availability of sugammadex and institutional policies on its use. We identified 60 Ontario hospitals with surgical services, and obtained contact information for 45 of the anesthesia departments. Surveys were sent to each department chief.

Thirty-four (75.6%) hospitals completed the survey. Twenty-seven (79.4%) of the hospitals had sugammadex. Of the 27 hospitals with sugammadex, 16 (59.3%) had specific policies on when sugammadex may be used. Based on policies, sugammadex was most frequently allowed to be used in emergency situations, especially failed intubations or "can't intubate, can't ventilate" situations where 100% of policies allowed its use. Thirteen (81.3%) hospitals allowed sugammadex use after early completion of a surgery, and 12 (75.0%) allowed use after re-curarization in the post-anesthetic care unit. Policies on specific patient populations for sugammadex use were uncommon, with seven (43.8%) hospital policies not specifying any patient populations.

Though most hospitals have sugammadex available, there is a marked heterogeneity in hospital policies on its use. Given the high cost of sugammadex use, it is worthwhile to have evidence-based policies on its use. Policies should consider secondary cost-saving benefits of sugammadex use, through improved operating room efficiency and decreased complication rates.

Morning Poster Presentations - Clinical Science

Relationship between exposure to household air pollution and asthma in children: a systematic review and meta-analysis.

Kristen A. Viaje(1), Christina T. Ma (2), Christopher K.W. Chiang(3), ***Kevin A. Karivelil**(2), Om P. Kurmi(4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Niagara, Ontario, Canada
(2) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(3) Michael G. DeGroote School of Medicine, McMaster University, Waterloo, Ontario, Canada
(4) Division of Respirology, Department of Medicine, McMaster University, Hamilton, Ontario, Canada

Introduction: Over 40% of the world's population are exposed to high levels of household air pollution (HAP) from solid fuel use. Although HAP is a risk factor for asthma morbidity in adults, the findings in children have not been extensively reviewed.
Aims: To summarize the relationship between HAP exposure and asthma in children.

Methods: PubMed, Medline, Scopus, Web of Science, CINAHL, Cochrane, and LILACS databases were searched to identify eligible observational and RCT studies of HAP and its link to asthma in children ≤18 years old. Article screening and data extraction were carried out in duplicate using standardised forms and quality assessed using the NIH Quality Assessment Tools. A random effects meta-analysis was performed using the generic inverse variance method. Complete protocol has been published in PROSPERO (CRD42018094283).

Results: Out of 25,865 articles identified initially, 15,045 titles and abstracts were screened following duplicate removal. Data were extracted from 30 studies that reported on asthma or wheezing outcomes and met the inclusion criteria. Compared to non-solid fuel use, use of solid fuel for cooking or heating was associated with an increased risk of asthma (OR 1.19, 95% CI 0.99-1.42) and wheezing (1.2, 1.03-1.40) though statistically not significant marginally for asthma. Further analysis showed that use of wood for cooking increased the risk of asthma (1.65, 0.96-2.83) and wheeze (1.32, 0.57-3.04), though statistically not significant. There was moderate to high heterogeneity (49-87%) between the studies.

Discussion: Overall, the results show exposure to solid fuel is associated with asthma and episodes of wheezing in children.

Morning Poster Presentations - Clinical Science

The Impact of Uterine Size on Patterns of Recurrence in Patients Diagnosed with High-grade Endometrial Cancer Undergoing Minimally Invasive Surgery; A Multi-Centre Canadian Study

Tomer Feigenberg (1), Béatrice Cormier (2), Michael Fung Kee Fung (3), Prafull Ghatage (4), Limor Helpman (5), Kizanee Jegatheeswaran (6), Rachel So Youn Kim (7), Janice Kwon (7), Susie Lau (8), Sarah Mah (7), Taymaa May (9), ***Maggie McNeill** (10), Gregg Nelson (4), Marie Plante (11), Marie Claude Renaud (11), Stephanie Scott (12), Sarah Shamiya (6), Danielle Vicus (12), ***Kristin Wright** (10), Walter Henri Gotlieb (8)

(1) Division of Gynecologic Oncology, Trillium Health Partners, University of Toronto, Toronto, Ontario, Canada
(2) Department of Obstetrics and Gynecology, Université de Montreal, Montreal, Quebec, Canada
(3) Department of Obstetrics and Gynecology, Division of Gynecologic Oncology, University of Ottawa, Ottawa, Ontario, Canada
(4) Department of Oncology, University of Calgary, Calgary, Alberta, Canada
(5) Department of Obstetrics & Gynecology, Division of Gynecologic Oncology, McMaster University, Hamilton, Ontario, Canada
(6) Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada
(7) Department of Obstetrics and Gynecology, Faculty of Medicine, University of British Columbia, Vancouver, British Columbia, Canada
(8) Division of Gynecologic Oncology, Jewish General Hospital, McGill University, Montreal, Quebec, Canada
(9) Division of Gynecologic Oncology, Princess Margaret Cancer Center, University Health Network, Toronto, Ontario, Canada
(10) Faculty of Medicine, McMaster University, Hamilton, Ontario, Canada
(11) Gynecologic Oncology Division, CHU de Québec-Hôtel-Dieu de Québec-Université Laval, Montreal, Quebec, Canada
(12) Dalhousie University, Halifax, Nova Scotia, Canada

Prospective studies in endometrial cancer (EC) have shown that minimally invasive surgery (MIS) is feasible and safe. Over the last decade, rates of MIS and complexity of surgeries are steadily increasing including surgery for patients with enlarged uteruses . Our objective was to assess the potential association between uterine size, and risk of recurrence, as large uteruses are difficult to extract.

A retrospective cohort study in 6 gynecologic oncology centres in Canada. Patients diagnosed with high-grade EC, between 2012-2016, who underwent MIS were included. Univariate and multivariable analyses were used to identify variables associated with risk of disease recurrence.

A total of 564 patients were included in the study, 50(8.87%) had robotic surgery, 443 (78.55%) had laparoscopy and 71(12.59%) had Laparoscopic assisted vaginal hysterectomy. With a median follow-up of 28 months, 118 (20.9%) patients recurred. In univariate analysis age, deep invasion, LVI, stage, positive cytology, uterine specimen weight >75 percentile (160 gr, HR 2.15) and volume>75th percentile (250 cm3,. HR-1.92) were associated with increased risk of recurrence. In multivariable analysis age, weight and stage remained significant. Diffuse carcinomatosis was the most common type of recurrence(35.6%). For these patients, specimen weight >75th percentile (HR 2.5) and the use of intra-uterine manipulator (HR 2.28) were associated with increased risk, however in multivariable analysis only weight remained significant.

Uterine size over the 75th percentile correlates with significant increased risk of recurrence. Additional studies are needed to examine the potential association between the use of intra-uterine manipulator and carcinomatosis at recurrence.

Morning Poster Presentations - Clinical Science

Rest-up: Researching the effects of sleep on step count during the postoperative period

Christina Reppas-Rindlisbacher(1), Maeve Conroy(2), *__Manan Ahuja__(2), __*Jessica Gormley__(2), Shailee Siddhpuria(3), Eric Wong(4), Justin Lee(1, 6), Christopher S Gabor(5), Sandra De Freitas(1), Alex Curcovic(5), Christopher Patterson(1,5,6)

(1) Department of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Michael G. DeGroote School of Medicine, Hamilton, Ontario, Canada
(3) Bachelor of Health Sciences, McMaster University, Hamilton, Ontario, Canada
(4) Department of Medicine, University of Toronto, Toronto, Ontario, Canada
(5) Hamilton Health Sciences, Hamilton, Ontario, Canada
(6) Geriatric Education and Research in Aging Sciences, St. Peter's Hospital, Hamilton, Ontario, Canada

Older adults admitted to hospital with hip fracture experience impaired functional mobility. Sleep deprivation in hospitalized patients may play a role in delayed postoperative mobilization. New technology in the form of wrist activity monitors allows for the collection of reliable assessments of movement and sleep during surgical recovery. The purpose of this study is to examine the influence of sleep duration and quality on post-operative mobility in older adults admitted to hospital with hip fracture.

Prospective observational cohort study of 80 patients (target) who are 65 and older admitted to Juravinski hospital (Hamilton, ON) with a hip fracture undergoing operative management. Participants will be fitted with a Fitbit® after surgery for sleep and step count monitoring for the duration of stay or a maximum of 14 days. Descriptive data and use of sedative/hypnotic medications in hospital will be collected from chart review of the electronic health record. Participants will be contacted 30 days after discharge to inquire about post-discharge secondary outcomes. The primary outcome is the total number of steps taken by participants during each 24-hour period after surgery for hip fracture. Secondary outcomes include delirium prevalence, hospital length of stay, post-operative complications, 30-day post-discharge mortality, mobility status, and location of disposition. A multivariate linear regression analysis will be used to evaluate the association between sleep duration and number of post-operative steps. Potential predictors of post-operative mobility will be adjusted for.

This study in currently in process, with four patients have been enrolled (Mean age 84). The average number of steps participants took each day was 264 (mean length of stay 8 days). Patients slept an average of 4.9 hours per night.

It is too early to make conclusions about the association between sleep duration and post-operative mobility, but early data shows that patients are likely sleep deprived.

Morning Poster Presentations - Clinical Science

Survival outcomes of marijuana users in p16 positive oropharynx cancer patients.

Han Zhang, MD, FRCSC(1); Michael Xie, B.Sc(2); ***Marc Levin**, B.Sc(2); Stuart D. Archibald, MD, FRCSC(2); B. Stanley Jackson, MD, FRCSC(1); J.E.M. Young, MD, FACS, FRCSC(1); and Michael K. Gupta, MD, MSc, FRCSC(1)

(1) Division of Otolaryngology—Head and Neck Surgery; McMaster University; Hamilton, Ontario, Canada
(2) Michael DeGroote Faculty of Medicine; McMaster University; Hamilton, Ontario, Canada

Oropharynx squamous cell carcinoma (OPSCC) has become the predominant subsite for head and neck mucosal cancers (HNC) due to the rise of human papillomavirus (HPV) related disease. Previous studies have suggested an association between marijuana use and HPV-related OPSCC. Despite this, no study has examined the potential relationship between marijuana use and survival in this subset of patients. As such, the objective of our study is to examine the survival outcomes of HPV-related OPSCC patients in marijuana users.

Patients who were marijuana users were identified from a prospectively collected database of HNC patients from January 2011 to 2015. A physical review of clinic records was undertaken to extract relevant patient, tumor, treatment, follow-up, as well as survival data. Patients greater than 17 years of age with pathologically proven p16 positive OPSCC were included. They were then case-matched in a 1-to-1 basis to patients who were non-marijuana users based on age, gender, and cTNM staging.

Forty-Seven patients met inclusion criteria within each group. Univariate logistic regression analysis showed that age, gender, and cT-Stage were predictive of disease recurrence within both groups ($p<0.05$). However, cN-stage, treatment modality, tumor subsite, tobacco use, and tobacco dose were not ($p>0.05$). There was no statistically significant difference between marijuana and non-marijuana user groups in 5-year ($p=0.400$) overall survival, disease-specific ($p=0.993$), disease-free ($p=0.404$), and metastasis-free survival ($p=0.384$).

No survival difference is found between HPV-related OPSCC marijuana users and non-users. This potentially opens the door for marijuana to be used as adjunctive treatment for psychosocial as well as quality of life.

Morning Poster Presentations - Clinical Science

The provision of medical assistance in dying: a scoping review

***Max Zworth**(1), Carol Saleh(2), Ian Ball(3), Gaelen Kalles(4), Anatoli Chkaroubo(4), Mike Kekewich(5), Paul Miller(4,6), Marianne Dees(7), Andrea Frolic(4), Simon J.W. Oczokowski (2.4,8)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Canada
(2) Department of Medicine, McMaster University, Hamilton, Canada
(3) Division of Critical Care Medicine, Department of Epidemiology and Biostatistics, Western University, London, Canada
(4) Hamilton Health Sciences, Hamilton, Canada
(5) Department of Clinical and Organizational Ethics, The Ottawa Hospital, Ottawa, Canada
(6) Division of Emergency Medicine, Department of Medicine, McMaster University, Hamilton, Canada
(7) IQ Healthcare, Radboud Institute for Health Sciences, Radboud University Medical Center, Nijmegen, The Netherlands
(8) Department of Health Research Methods, Evidence, and Impact, McMaster University, Hamilton, Canada

In 2016 Bill C-14 legislated criteria under which patients could receive MAID in Canada, but did not provide guidance regarding the technical aspects of providing an assisted death. We conducted a scoping review of the existing literature describing the medications, settings, participants and outcomes of MAID, in order to identify knowledge gaps and areas for future research.

We searched online databases, clinical trial registries, conference abstracts, and professional guidelines from jurisdictions where MAID is legal, up to June 2017. Eligible reports included technical summaries, institutional policies, practice surveys, practice guidelines and clinical studies that describe MAID provision in adults who have provided informed consent. Two independent investigators screened reports using pilot-tested forms, and collected data using standardized forms. (1)

The systematic search and grey literature search identified 10107 references and 22 protocols, respectively. 147 articles published between 1992 to 2017 met eligibility criteria. 72 studies described details for MAID administered by IV medications, and 46 provided data on oral medications. In IV protocols, MAID was most commonly administered using general anesthetic such as barbiturates (32/147) or propofol (20/147) followed by a neuromuscular blocker. Oral protocols most often used barbiturates alone (36/147) or with a neuromuscular blocker (13/147), and recommended using a prokinetic agent prior to lethal drug ingestion. Common complications included prolonged duration of dying, difficulty obtaining IV access, and difficulty swallowing oral agents. Most commonly, physicians' roles were prescribing (71/147) and administering medications (78/147). Nurses occasionally administered medications (17/147) and supported the patient (14/147) or family (13/147).

We identified several trends in MAID provision including common medications and doses, roles of healthcare professionals and families, and complications that may cause distress. Future research should aim to identify the medications, dosages, and administration techniques and procedures, which produce the most predictable outcomes and mitigate distress for those involved.

Morning Poster Presentations - Clinical Science

The Canadian Retinoblastoma Research Advisory Board: A Framework for Patient Engagement

***Maxwell J. Gelkopf**, BSc(1,2), Iva Avramov, BSc(3), Yoel A.Yakobi(1,2), Kaitlyn Flegg, MSc(1), Helen Dimaras, PhD(1, 2, 4, 5,6)

(1) Ophthalmology & Vision Sciences, The Hospital for Sick Children, Toronto Canada
(2) Child Health Evaluative Sciences Program, SickKids Research Institute, Toronto, Canada
(3) Human Biology Program, Faculty of Arts & Science, University of Toronto, Toronto, Canada
(4) Division of Clinical Public Health, Dalla Lana School of Public Health,
(5) Department of Ophthalmology & Vision Sciences, Faculty of Medicine, University of Toronto, Toronto, Canada
(6) Department of Human Pathology, College of Health Sciences, University of Nairobi, Nairobi, Kenya.

Purpose: The Canadian Retinoblastoma Research Advisory Board (CRRAB) is a multidisciplinary group, including patients (i.e. survivors and parents), health professionals and researchers, that aims to establish and sustain patient engagement in retinoblastoma research. The purpose of this study was to uncover CRRAB member understanding and attitudes towards patient engagement in research, and their level of research engagement.

Methods: CRRAB members were surveyed by pre- and post-test questionnaire at the 2016 annual general meeting to assess understanding and perceptions of patient engagement in research. A second questionnaire was administered at the 2017 annual general meeting to assess awareness and perceived impact of CRRAB activities, and individual engagement in research. Data were analyzed by descriptive statistics and paired t-test (for pre/post-test).

Results: Twenty-one individuals participated in 2016 and self-identified as patients (11, 52%), health professionals (6, 29%), and/or researchers (7, 33%) (participants could overlap stakeholder groups). Overall, the perceptions that research is relevant to all stakeholders and that patients can have meaningful impact on research, were common among participants in both pre- and post-tests. In 2017, 35 individuals participated. They identified as patients (21, 60%), health professionals (9, 26%), and/or researchers (8, 23%). Eighty-nine percent of participants were aware of CRRAB initiatives and 63% had participated over the last year. Participants perceived CRRAB to provide diverse opportunities for patient engagement in research and perceived patient engagement to have meaningful impact on retinoblastoma research.

Conclusions: The results of this study suggest that CRRAB is an effective vehicle for engaging patients in retinoblastoma research.

Morning Poster Presentations - Clinical Science

Characterizing the left and right atrial adaptations in middle-aged chronic endurance athletes: a cMRI study.

***Meghan E. Glibbery**, Jack Goodman.

Faculty of Kinesiology and Physical Education, University of Toronto, Toronto, Ontario, Canada

Chronic endurance exercise induces several hemodynamic stressors on the cardiovascular system resulting in adaptations collectively defined as the Athlete's Heart.

We characterized the morphological adaptations in the left atrium (LA) and right atrium (RA) in response to chronic endurance training using the gold-standard imaging modality of cardiac magnetic resonance imaging (cMRI) in both middle-aged elite endurance athletes (n=71) and recreationally active controls (n=19). All subjects underwent maximal exercise testing (VO2max), exercise history questionnaires, and received a cMRI scan.

Endurance athletes demonstrated objectively larger LA and RA volumes than controls. LA and RA volumes were positively correlated to VO2max, although not lifetime endurance hours. Male athletes demonstrated greater atrial dimensions than female athletes.

Overall there was a weak ability to predict the magnitude of atrial remodeling specific to an athlete, suggesting a large heterogeneity in the atrial response to chronic endurance activity in the middle-aged athletic cohort.

Morning Poster Presentations - Clinical Science

Association between dietary patterns and risk of COPD in adults: a systematic review

***Michael K. Parvizian** (1), Jeremy Li (1), Manreet Dhaliwal (1), Imran Satia (2,3) and Om P Kurmi (2,4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada.
(2) Department of Medicine, Division of Respirology, McMaster University, Hamilton, Ontario, Canada
(3) Faculty of Biology, Medicine and Health, Division of Infection, Immunity and Respiratory Medicine, University of Manchester, United Kingdom
(4) Population Health Research Institute, Division of Respirology, Department of Medicine, McMaster University, Hamilton, Canada

Background: Although various nutrients are reported to be modifiable risk factors associated with the development of Chronic Obstructive Pulmonary Disease (COPD), individual foods and nutrients are not consumed in isolation. As a result, recent research has investigated the effects of entire dietary patterns on COPD, however these studies demonstrate inconsistent findings.

Objective: To evaluate the effects of various dietary patterns on the risk of COPD.

Methods: The databases MEDLINE, EMBASE, WoS, CINAHL, LILACS, the Cochrane database, and AMED were searched for studies published from January 1, 1980-April 20, 2018. 9083 records were identified and screened independently by two reviewers for inclusion using pre-defined criteria. The search terms and screening criteria included studies reporting on asthma and COPD, however, only results related to different dietary patterns and COPD are presented here.

Results : After screening, four articles met our inclusion criteria for dietary pattern and COPD. Meta-analysis was not possible due to an insufficient number of studies for any one dietary pattern. Ogunmoroti et al. demonstrated that an "ideal" diet as defined by the American heart Association was not significantly associated with risk of COPD (HR 0.44, 95% CI 0.06-3.21) (1). Varasso et al. demonstrated in 2 separate cohorts that a prudent diet reduced the risk of COPD (2,3). Varasso et al. additionally demonstrated that a "western" diet increased COPD risk in men, but not women, and the "Alternate Healthy Eating Index 2010" decreased the risk of COPD in women but not men (2-4).

Conclusion: Initial research shows that dietary patterns may play a significant role in modulating COPD risk. However, there is a need for additional high quality, prospective studies evaluating the effects of dietary patterns on COPD risk to allow for informed clinical decision-making surrounding diet in preventing COPD.

Morning Poster Presentations - Clinical Science

Neonatal Outcomes after Transfusion of ABO Non-Identical Blood (Neo-ABO)

***Michael K. Parvizian** (1), Rebecca Barty (2), Na Li (2), Tara McDougall (2), Nancy Heddle (1,2), Amit Mukerji (3), Christoph Fusch (3), Ziad Solh (4,5)

(1) Department of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) McMaster Centre for Transfusion Research, McMaster University, Hamilton, Ontario, Canada
(3) Department of Pediatrics, McMaster University, Hamilton, Ontario, Canada
(4) Department of Pathology & Laboratory Medicine (PaLM), Schulich School of Medicine & Dentistry, Western University, London, Ontario, Canada
(5) Department of Medicine, Division of Hematology, Schulich School of Medicine & Dentistry, Western University, London, Ontario, Canada

Necrotizing enterocolitis (NEC) is a major cause of morbidity and mortality in very-low birth weight (VLBW; <1500 grams) neonates. The etiology of NEC is unclear with some studies suggesting a temporal association between red blood cell (RBC) transfusion and NEC; this remains controversial (1). Studies have yielded conflicting results regarding the association between NEC and ABO group in transfused neonates (2,3). Hamilton neonates receive O group RBCs regardless of ABO group, but other Canadian hospitals use ABO identical blood. The objectives of this study are to determine if VLBW neonates receiving ABO non-identical RBCs have an increased risk of NEC and mortality compared to neonates receiving ABO identical RBCs.

A retrospective observational study was conducted using data from the Transfusion Research, Utilization, Surveillance, and Tracking (TRUST) database, Canadian Neonatal Network (CNN) database, and supplemental chart review. VLBW neonates admitted to the McMaster Children's Hospital Level III NICU or St. Joseph's Healthcare Hamilton NICU between April 1, 2004 and June 30, 2016 in Hamilton, Ontario, Canada were included. The primary outcome was development of NEC, with mortality collected as a secondary outcome. A multivariate cox regression was conducted.

2235 neonates meeting inclusion criteria were identified, with 1026 receiving at least one RBC transfusion. RBC transfusion was not significantly associated with NEC (HR 1.40, 95% CI: 0.76-2.60) in an analysis of all patients. In patients who received transfusion, exposure to ABO identical versus ABO non-identical RBCs was not significantly associated with NEC (HR 1.16, 95% CI 0.63-2.13), or mortality (HR 2.12, 95% CI 0.82-5.50).

RBC transfusion was not associated with NEC in VLBW neonates. The association between ABO identical versus non-identical RBCs and outcomes of NEC and mortality was not observed in our large cohort. A prospective multi-centre trial is required to determine the safest transfusion practice for VLBW neonates in Canada.

Morning Poster Presentations - Clinical Science

Cemented Humeral Stem versus Press-fit Humeral Stem in Total Shoulder Arthroplasty: A Systematic Review and Meta-Analysis

***Michael Uy** (1), Julian Wang (1), Nolan S. Horner (2), Asheesh Bedi (3), Timothy Leroux (4), Bashar Alolabi (2), Moin Khan (2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada.
(2) Division of Orthopaedic Surgery, Department of Surgery, McMaster University, Hamilton, Ontario, Canada.
(3) MedSport, University of Michigan, Ann Arbor, USA
(4) Division of Orthopaedic Surgery, Department of Surgery, University of Toronto, Toronto, Ontario, Canada

Fixation of the humeral stem in total shoulder arthroplasty (TSA) involves either cementing or press-fit. No clear consensus regarding long-term outcomes exist, thus the choice of fixation is variable among surgeons. The purpose of this study is to evaluate the differences in revision events, complication rates, and radiographic outcomes between cemented and press-fit humeral stems in primary TSA.

A comprehensive systematic review was conducted searching for studies that included patients who underwent primary TSA for primary osteoarthritis or rheumatoid arthritis. A meta-analysis of proportions was conducted for descriptive purposes, and an exploratory meta-regression was used to identify potential modifying variables of revision events.

A total of 36 studies were identified which included 927 patients with cemented humeral stems, and 1555 patients with press-fit stems. Revision rate for cemented humeral components was 2% at a mean of 29 months, compared to 2% at a mean of 35 months for press-fit stems. In both groups, 28% of complications consisted of rotator cuff pathology. Fixation method, stem length, and indication for surgery were not significant moderators (respectively, $p = 0.825$, 0.323, 0.389), though longer follow up time was found to be significant ($p = 0.003$).

Cement fixation had similar revision rates when compared to press-fit stems at short to midterm follow up. Rotator cuff pathology was a prevalent complication in both groups but is likely not related to fixation type. Overall, with comparable revision rates, easier revision, and decreased operative time, humeral press-fit fixation may be an optimal choice for primary anatomical TSA in patients with sufficient and appropriate bone stock. Further large randomized control trials are required to definitively confirm optimal fixation technique, particularly with novel stem designs and stem length.

Morning Poster Presentations - Clinical Science

Benefits and risks of anaphylactic interventions: a systematic review and meta-analysis

***Amanda J. Lee**, Yosef Ellenbogen, Susan Waserman, Derek K. Chu

Department of Medicine, McMaster University, Hamilton, Ontario, Canada.

Although epinephrine, corticosteroids, and antihistamines are currently used to treat anaphylaxis, they can also contribute adverse outcomes, including life-threatening arrhythmia. Previous systematic reviews of randomized controlled trials (RCTs) have failed to provide any evidence to inform the efficacy and safety of these therapies. In the absence of RCTs, observational studies are the ideal data source to examine the risks and benefits of interventions. In this review, we aim to evaluate the risks and benefits of epinephrine, corticosteroids, and antihistamines, versus no treatment for anaphylaxis.

We searched MEDLINE, EMBASE, LILACS, ICTRP, and CENTRAL up to Jan 16, 2017. Selection criteria included RCTs, cohort studies, and case series involving anaphylaxis. Studies limited to anaphylaxis in-hospital or long-term care facilities, or in patients with mastocytosis or aspirin-exacerbated respiratory disease were excluded. We followed the Cochrane Handbook for Systematic Reviews and registered this review with PROSPERO (CRD42018082292).

After full-text review, we identified 36 records for analysis. We found that neither epinephrine, antihistamines, corticosteroids, or beta-agonists significantly affected the risk of biphasic reaction. While the use of corticosteroids and beta-agonists had no impact on the risk of hospitalization post-anaphylaxis, treatment with epinephrine and antihistamines appeared to increase the risk of hospitalization. It should be noted, however, that the majority of these studies were noted to have a severe risk of bias and this increased risk may reflect the severity of anaphylaxis requiring treatment rather than the treatment itself.

The risks and benefits of different anaphylactic treatments remain uncertain as the current evidence available for inclusion are at a severe risk of bias. Further high-quality studies addressing the risks and benefits of anaphylaxis are needed to improve our ability to confidently evaluate the impact of anaphylactic treatments.

Morning Poster Presentations - Clinical Science

Metabolic outcomes after bariatric surgery for Indigenous patients in Ontario

***Olivia Lovrics** (1), Aristithes G. Doumouras (1), Scott Gmora (2), Mehran Anvari (2), Dennis Hong (2)

(1) Department of Surgery, St. Joseph's Hospital Hamilton
(2) Department of Surgery, McMaster University

In 2013, 18% of Canadian adults had obesity (body mass index (BMI)>30kg/m2), compared to 25.7% of Canada's Indigenous population. Bariatric surgery has been shown to be an effective treatment for obesity and related comorbidities, but has not been studied in Canadian Indigenous populations. Therefore, this study aims to determine the effects of bariatric surgery in the Indigenous Ontario population using multicentre data from a publicly funded bariatric registry.

Prospectively collected data using all surgical patients between March 2010-2018 was included in initial analysis. Analysed post-operative outcomes included diabetes, hypertension, gastroesophageal reflux disease (GERD), and medication requirements. Demographics, baseline characteristics, and univariate outcomes were assessed using Pearson Chi-Squared or t-tests. Multivariable regression for BMI change was utilized with complete case analysis and multiple imputation.

Of 16,629 individuals initially identified, 338 self-identified as Indigenous, 13,502 as non-Indigenous, 2789 omitted ethnicity designation and were excluded. Baseline demographics were not statistically different between Indigenous and non-Indigenous groups; rates of hypertension ($p=0.03$) and diabetes ($p<0.001$) were higher in the Indigenous population. Univariable analysis showed similar 1-year BMI change (Indigenous: 15.8±6.0kg/m2; Non-Indigenous: 16.1±5.6kg/m2, $p=0.362$). After adjustment, BMI change was not different between groups at 6-months (Effect Size= 0.07, 95%CI -0.45 to 0.58, $p=0.803$) and 1-year (Effect Size = -0.24, 95%CI -0.93 to 0.45, $p=0.489$). Rates of comorbidities were similar at 1-year between the two populations despite differences at baseline. 6-month and 1-year follow-up rates were higher in the non-Indigenous population ($p<0001$, $p=0.005$, respectively).

Weight loss and resolution of obesity-related comorbidities are similar in Indigenous and non-Indigenous patients following either sleeve gastrectomy or roux-en-y gastric bypass surgery. Additional factors, such as access to surgery, patient selection and long-term results, merit further investigation.

Morning Poster Presentations - Clinical Science

Double-balloon enteroscopy for diagnostic and therapeutic ERCP in patients with surgically altered gastrointestinal anatomy: a systematic review and meta-analysis

Sama Anvari* (1, 2, 3), Yung Lee (1, 2, 3), Melissa Soon (2, 3), Aristithes G. Doumouras (2, 3), Dennis Hong (2, 3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada.
(2) Division of General Surgery, Department of Surgery, McMaster University, Hamilton, Ontario, Canada.
(3) Centre for Minimal Access Surgery (CMAS), St. Joseph's Healthcare, McMaster University, Hamilton, Ontario, Canada.

Patients with surgically altered gastrointestinal (GI) anatomy present a unique endoscopic challenge for the performance of endoscopic retrograde cholangiopancreatography (ERCP), with only 16% of attempts achieving enteroscopy success with push enteroscopy techniques. Multiple studies have shown that double balloon enteroscopy (DBE) is safe and efficacious, but attempts to synthesise these data are limited. The purpose of this study was to conduct a systematic review and meta-analysis of the existing literature evaluating the diagnostic and therapeutic success, as well as the safety of DBE-ERCP in surgically altered anatomy.

We searched MEDLINE, EMBASE, CENTRAL, and Web of Science databases through June 2018 for studies that conducted DBE-ERCP in patients with surgically altered upper GI anatomy (including Billroth II, Roux-en-Y reconstructions, pancreatoduodenectomy, pancreaticojejunostomy, choledochoduodenostomy, hepaticojejunostomy). Primary outcomes were enteroscopic (bile duct cannulation), diagnostic (cholangiogram obtained), and procedural success rates of DBE-ERCP. Secondary outcomes were adverse events after DBE-ERCP. Freeman-Tukey double arcsine transformation and random effects meta-analysis was performed when appropriate. The Newcastle-Ottawa scale was used to evaluate risk of bias. Assessment of heterogeneity was completed using the inconsistency (I2) statistic.

18 studies involving a total of 671 patients met the inclusion criteria. The pooled enteroscopic, diagnostic, and procedural success rates of DBE-ERCP were 90% (95% confidence interval (CI), 84-94%), 91% (95% CI, 81-95%), and 93% (95% CI, 86-98%). Adverse events were reported in 4% (95% CI, 2-6%) of cases. Subgroup analysis of short-DBE (140-152 cm) and long-DBE (200 cm) did not demonstrate substantial difference in outcomes. Heterogeneity was high (I2 >50%) across all outcomes.

DBE is safe and efficacious for facilitating ERCP in patients with surgically altered gastrointestinal anatomy. Future RCTs or comparative studies would help further clarify the role of DBE-ERCP compared to other modalities in surgically altered anatomy

Morning Poster Presentations - Clinical Science

Rapid response programs in supporting evidence-informed decision-making: A scoping review of current methods and models

***Steven Jia Tong Chen**(1), Kathy Huang(1), Likhwa Ncube(2), Laurenz Langer(2), Natalie Tannous(2), Carina Van Rooyen(2)

(1) Department of Health Evidence, and Impact, McMaster University, Hamilton, Ontario, Canada
(2) Africa Centre for Evidence, University of Johannesburg, Johannesburg, Gauteng, South Africa

Recently, there has been a push for increased evidence use in decision-making processes in government. One method to increase evidence-informed decision-making (EIDM) is the use of rapid response services (RRS), wherein the best available evidence is packaged by researchers in response to an end user's request. To our knowledge, this is the first study to compare RRS across sectors, addressing both methodological features of the rapid products, as well as operational considerations internal to the programs.

This study was conducted using a systematic review methodology. We searched for articles from January 1981 to June 2018 in PubMed, Web of Science, EBSCO and Google Scholar. We formally searched for grey literature and conducted hand searches through reference lists to ensure comprehensive results.

A total of 5167 records were retrieved, of which 48 articles are included in this synthesis. Only 6 articles discussed RRS in non-health sectors. RRS were also disproportionately found in high-income countries. We found large heterogeneity in the terminology, methodology and timelines used in current RRS models. Many studies discussed the importance an adaptable RRS based on user needs and resources constraints. Staffing considerations and end-user feedback were also key considerations when designing a RRS.

The field of EIDM has garnered significant attention in the past decades. One means of pushing forth evidence in the policy sphere is the use of RRS. Our review found 108 services across 35 countries. We note the considerable heterogeneity in terms of terminology, methodology and timeframes across the different programs. Furthermore, end-user feedback suggests that evidence was most commonly used on an ad-hoc basis, or "in the moment" type decisions. Similar to other studies, our findings indicate a need to move towards the institutionalization of rapid response programs. Investment is needed to routinize evidence use in decision-making processes, as opposed to ad-hoc or post-hoc uses based solely on key policy evidence champions.

Morning Poster Presentations - Clinical Science

Type A botulinum toxin in the management of salivary otorrhea – a case report

***Teffran J. Chan**(1), Trevor Lewis(2), Doron Sommer(2)

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

Salivary otorrhea is a rare condition which has been reported in the setting of congenital parotid fistulas, branchial cleft anomalies, and anatomic defects of the external auditory canal. Patients typically present with increased otorrhea upon consumption of foods or dental procedures. Conventionally, definitive treatment includes management with temporalis fascia, tragal perichondrium repair, superficial parotidectomy, or fistula tract obliteration. Previously, type A botulinum injections in the parotid gland for sialorrhea was first cited by Bushara and was later confirmed by Petracca et. al in a longitudinal study to be safe and well-tolerated for long term clinical use. In this case study, we aim to assess the efficacy of type A botulinum toxin injections into the parotid as conservative management of salivary otorrhea in the presence of parotid fistulas.

Transcribed consultation reports, clinic notes, and operative reports were collected and interpreted from Hamilton Health Sciences Meditech and Clinical Connect database. The duration the symptom management, morbidity, and complications were documented through periodic follow up encounters.

Gradual decrease in otorrhea during first 3 postoperative weeks with a complete cessation by 3 ½ week. Patient reports transient episodes of left facial swelling which resolves within 2 hours. Minimal secretions appreciated from the left Stensen's duct. No other morbidities were reported.

Type A botulinum toxin injections to the parotid successfully suppressed the salivary otorrhea with no post-procedural complications or morbidity. Though definitive treatment is ideal, surgical manipulation near the parotid gland poses risks of damaging the facial nerve and general anesthetic risks. Injected botulinum toxin can mitigate these risks when performed either blindly by experienced clinicians or under ultrasound image guidance. Overall, type A botulinum toxin appears to be a safe and minimally invasive alternative to achieve symptomatic control in patients who would otherwise not tolerate surgical procedures.

Morning Poster Presentations - Clinical Science

Worked examples for teaching ECG interpretation: salient features or discriminating features?

***Terry Thach**(1), Sarah Blisset(2), Matthew Sibbald(3)

(1) McMaster University
(2) McGill University Department of Cardiology
(3) McMaster University, Centre for Simulation-Based Learning

Junior physicians have poor inter-rater reliability in ECG interpretation despite its ubiquity in healthcare. The purpose of this study was to compare two online learning interventions employing worked examples, one based on salient features, the other based on discriminating features, using first-year medical students. Diagnostic accuracy on a post-intervention electrocardiogram interpretation test was the primary outcome.

First-year medical students from McMaster University were recruited electronically. Students completed their introductory phases, learning phases, and testing phases online through a survey interface, SurveyGizmo, open for a one-week period to each participant. The sessions were completed in one sitting, independently, anonymously, and at their leisure. Participants progressed through five phases in order: introductory phase, learning bradycardias, testing bradycardias, learning tachycardias, testing tachycardias. Participants were randomized to receive either salient features worked examples or discriminating features worked examples when learning bradycardias; they received the opposite type of worked example when learning tachycardias, therefore acting as their own cross-over control.

Participants reported greater intrinsic load in the salient features modules as opposed to the discriminating features modules (12.46 $\pm$ 6.14 versus 11.92 $\pm$ 6.12, respectively; $p = 0.01$). Participants showed no difference in diagnostic accuracy during the testing phases following the salient features and discriminating features learning phases (6.8 $\pm$ 2.6 versus 7.1 $\pm$ 2.5, respectively; $p = 0.32$).

This study provides evidence regarding the superiority of discriminating features-based worked examples over salient features in teaching novice clinicians ECG interpretation. Participants perceived the core content as more difficult in the salient features worked examples, represented by the significantly greater intrinsic load reported. Numerically, the discriminating features interventions imposed less extraneous cognitive load and yielded greater germane load. This suggests greater knowledge retention presented in an non-obfuscated manner.

Morning Poster Presentations - Clinical Science

Effectiveness of De-prescribing on Mobility: Systematic Review and Meta-analysis

Donna Fitzpatrick-Lewis (1, 2) , Larkin Lamarche (3), Diana Sherifali (1, 2, 4), Meghan Kenny (2, 4), Muhammad Usman Ali (2, 4), ***April Liu** (3), Parminder Raina (2, 4) and Derelie Mangin (3)

(1) School of Nursing, McMaster University
(2) McMaster Evidence Review and Synthesis Team
(3) Department of Medicine, Faculty of Health Sciences, McMaster University
(4) Health Research Methods Evidence and Impact

The prevalence of people living with multimorbidity, the coexistence of two or more medical conditions, is increasing. Additionally, polypharmacy, the use of five or more medications, is also rising. Polypharmacy is associated with negative consequences including cognitive impairment, hospitalizations, and medical errors. Numerous de-prescribing interventions have been developed to target polypharmacy. The purpose of this review is to synthesize existing knowledge about polypharmacy interventions' impact on mobility outcomes, including falls incidence and physical function.

A search of electronic databases (Medline, Embase, CINAHL, Cochrane Central and Cochrane Database of Systematic Reviews) was conducted for interventions to reduce polypharmacy. Studies were included if they assessed polypharmacy interventions in older adults (age $\geq$ 65 years) and measured mobility outcomes. Studies were appraised for quality using Cochrane risk of bias tool and Newcastle-Ottawa scale appropriately. A meta-analysis was conducted based on type of outcome, intervention compliance, and study quality.

The search yielded 5872 citations; 9 studies (7 RCTs and 2 observational studies) met inclusion criteria. The reviews were published between 1999 and 2018. The RCTs ranged in quality from low to high risk of bias, while both observational studies were rated as good quality. Observational cohort studies found a 52% reduction in falls incidence (95% CI, 0.23 to 0.99; $p<0.05$) and significant improvements on physical function tests including the 10 minute walking test and the Timed 'Up & Go' test. There was significant heterogeneity in the quality of RCTs; RCTs with a low risk of bias found a 60% reduction in falls incidence (95% CI, 0.27 to 0.59; $p<0.001$).

Deprescribing interventions show potential in improving mobility outcomes in older adults through a reduction in falls incidence and improvements in physical functioning. This highlights the importance of further high quality research to evaluate the impact polypharmacy interventions have on patient mobility.

Morning Poster Presentations - Clinical Science

Retrospective study of ocular involvement in patients with candidemia

Dr. Lily Zhao (1), Dr. Jenny Qian (2), ***Victoria Liu** (3), Dr. Forough Farrokhyar (4), Dr. Deborah Yamamura (5), Dr. Varun Chaudhary (6)

(1) Department of Ophthalmology, McMaster University
(2) Department of Ophthalmology, McMaster University
(3) MD program, McMaster University
(4) Department of Surgery, McMaster University
(5) Department of Pathology and Molecular Medicine, McMaster University
(6) Department of Ophthalmology, McMaster University

Consultations to rule out ocular involvement in patients with positive blood culture for candida are the most common medical reason for inpatient ophthalmologic consultations. At most Canadian centers, a positive fungal blood culture generates an automatic consult to ophthalmology regardless of risk factors and symptoms, as suggested by guidelines. Recent literature has shown that the candidemia incidence has been increasing, but the incidence of ocular candidiasis has been decreasing. Historically, the rate of ocular candidiasis has been reported to be as high as 45%, while recent studies have estimated the rate of ocular dissemination to be <9%. Currently, there are no Canadian studies looking into the rate of ocular involvement for inpatients with candidemia. In this study, we hope to look into the incidence of ocular involvement in patients who had a positive candida blood culture in Hamilton hospitals and identify risk factors for intraocular involvement in these patients.

The study will be a retrospective study involving all Hamilton hospitals from both Hamilton Health Sciences and St. Joseph Healthcare systems. Consecutive patients (18 years or older) between the years 1998 to 2018 who had a positive blood culture for Candida species will be identified. The medical records will be reviewed for baseline demographics, past medical history, microbiology results, anti-fungal medication(s), and ophthalmology consults. For patients who received an ophthalmology consult, all ocular findings will be reviewed with a special focus on the presence of vitritis, chorioretinitis, and/or endophthalmitis. The incidence of ocular involvement in patients with fungemia will be calculated. Logistic regression analysis will be conducted to explore the risk factors that predispose patients to ocular involvement.

Interim data of patients who have had a positive blood culture for all species of Candida between the years 2016 to 2017 will be analyzed and presented.

Morning Poster Presentations - Quality Improvement

Feasibility of Standardizing Pre-operative Assessment Clinics Across a Hospital System

Megan E. Brown(1), ***Cameron F. Leveille**(2), Jean Paul Paraiso(3), David Nykolaychuk(3), Madelyn P. Law(1)

(1) Faculty of Applied Health Sciences, Brock University, St. Catharines, ON
(2) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON
(3) Niagara Health System, St. Catharines, ON

Pre-operative assessments, which include patient history and physical examination, are fundamental in ensuring patient education about their procedure, leading to successful post-operative outcomes. Within Niagara Health (NH), there are 3 main hospital sites where operations occur. Currently, there is inconsistency in the pre-operative assessments between sites for the same surgical procedures, demonstrated by variation in pre-operative assessment times, activities, and information given to patients. The aim of this project is to understand where standardization through quality improvement (QI) initiatives should begin within these pre-operative assessment clinics and determine the feasibility of standardization across varying hospital sites.

This study utilized a mixed methods approach to assess the pragmatically of standardization of a pre-operative form. Plan, Do, Study, Act (PDSA) cycles were conducted and involved structured observations at each site to gain a comprehensive understanding of pre-operative practices across sites. Root causes analysis was utilized to assess factors such as gender, age ad surgical complexity on consult time. Finally, affinity analysis was conducted to determine the most feasible areas of standardization.

Moderate correlation at two sites and strong correlation at one site was found between patient age and consult time. Affinity analysis determined that the most pragmatic and feasible area for improvement was through standardization of admission history forms. While the piloting of a new standardized form showed no significant increase in consult times, fundamental barriers such as nursing staff turnover, lack of familiarity with the new form, and concerns of comprehensiveness prevented the continuation of this new standardized form.

Future attempts at standardization should begin with collaboration and co-design with pre-op clinic staff, followed by identification of elements of the complex adaptive system that can feasibly be standardized to reduce unnecessary variation while at the same time increasing buy-in for form use.

Morning Poster Presentations - Quality Improvement

Febrile neutropenia in the emergency department: a prospective threat and error analysis

Marija Kacar(1), ***Lauren Beals**(2), Adam J. Fleming(3), April J. Kam(3)

(1) Department of Pediatrics, McMaster University, Hamilton, Ontario, Canada
(2) McMaster University, Hamilton, Ontario, Canada
(3) Department of Pediatrics, Division of Hematology-Oncology, McMaster University, Hamilton, Ontario, Canada
(4) Division of Pediatric Emergency Medicine, McMaster University, Hamilton, Ontario, Canada

Febrile neutropenia (FN) is an emergency that requires urgent treatment with broad spectrum antibiotics to prevent sequelae of infection. Many pediatric emergency departments (EDs) have developed standardized order sets to streamline FN management, yet most centers fail to achieve antibiotic delivery within the recommended 60-minute time frame. Objectives – Determine the average time to antibiotic delivery for pediatric patients with FN at a single tertiary center ED and identify delays in treatment using a Threat and Error Management model.

A prospective quality improvement study of patients aged 0 to 18 years who were diagnosed with FN over an 8-month period. Patients were identified daily from ED tracking records for chart review by two independent reviewers. Surveys were distributed within 2 days of each encounter to associated staff members for additional commentary. Cases were analyzed to identify any threats (environmental factors that encourage errors), errors (humans actions that compromise safety), or unintended states (adverse patient outcomes).

Seven of 69 patients treated for febrile neutropenia within the study window (15.9%) received antibiotics within the first hour, with a mean time of 2.5 hours to delivery. 43 cases (62%) had recorded threats or errors, the most common being patient or family factors (48%), equipment failure (37%), and non-standard practice (35%). Individually, prolonged time to IV access (52%) and delays in receiving orders (68%) were the most common. There were five total unintended states including 2 PACE teams activations, 1 antibiotic anaphylaxis, 1 PICU admission and 1 death. 177 ED physicians and nurses were surveyed, and identified waiting for bloodwork, delays in receiving orders, and failure to use topical creams as the greatest barriers to care.

Current practice for pediatric ED FN management does not meet recommended guidelines. Initiatives to improve staff proficiency and task transition time are warranted.

Morning Poster Presentations - Quality Improvement

Ice cream rounds: exploring protected academic time for medical student wellness

***Lauren Beals**(1), Massoud Jalayer(2)

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

Emergency medicine (EM) is a challenging rotation for clinical clerks, who encounter acutely-ill patients and difficult ethical scenarios. Unfortunately, time restraints and patient volume in a busy ED can limit opportunities to debrief upsetting encounters, contributing to student distress and long-term burnout. Similar challenges have been observed in practicing EM residents, prompting the creation of peer driven programs designed to offer controlled debriefing. Generally, these programs are offered within protected academic time, feature light refreshments, and have generated positive results across Canadian centers.4 However, no studies have addressed whether similar programming could be implemented for the benefit of clinical clerks. Objective - To evaluate whether a voluntary student lead debriefing session built into protected academic time would be beneficial for the wellness of clerkship students rotating through EM.

A literature review was completed to identify evidence -driven suggestions for appropriate program design. A final proposal for "Ice Cream Rounds" modelled after the Canadian Association of Emergency Medicine Feature Education Innovation was adopted. A voluntary, one-hour student lead session with guiding questions for large group discussion was added to the end of the EM rotation. Clerkship students who attended the session provided structured feedback describing their experience and its relevance to personal wellness.

39/54 (72%) of event participants completed activity feedback. 95.2% felt the session fostered collegiality, 81% thought it was an effective chance to debrief encounters and 100% recommended ice cream rounds to future students. 28.6% of participants would prefer the event was more structured, suggesting the inclusion of a resident lead.

Ice cream rounds is a low resource, feasible initiative that can be implemented to address gaps in wellness programming for undergraduate medical students. The program demonstrates clear benefit in relevant student domains and is highly recommended by participants for future use.

Morning Poster Presentations - Quality Improvement

Assessing quality of goals of care conversations during the Serious Illness Care Program quality improvement Initiative

***Christina Ma**(1), ***Lauren E. Riehm**(1), John You(1,2)

(1) Department of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Department of Health Research Methods, Evidence, and Impact, McMaster University, Hamilton, Ontario, Canada

Seriously ill inpatients have indicated that better goals-of-care conversations are vital for improving care. We adapted and implemented the Serious Illness Care Program (SICP) to improve goals-of-care conversations at Hamilton General Hospital (HGH). Previous work in tertiary care outpatient cancer clinics has shown that the SICP results in more, better, and earlier conversations about goals of care. The aim of this study is to assess whether goals-of-care conversations improved after implementation of the SICP at HGH.

This retrospective chart review evaluated patients who were admitted to medical wards at HGH. Eligible patients were admitted for at least 48 hours and were at risk of prolonged hospital admission or increased need for community-based services (Assessment Urgency Algorithm score >4; score range from 1 to 6). We used a validated codebook to assess the quality of documented goals-of-care conversations for patients who were and were not enrolled in the SICP, specifically examining the following domains: patients' values and goals, prognosis and illness understanding, end-of-life care planning, and code status.

The study sample included 56 control patients from a time period before SICP implementation and 56 patients from the SICP implementation period. The conversations of intervention patients scored significantly higher ($p<0.05$) on all codebook domains than those conducted in the control group.

Implementation of the SICP was associated with a higher quality of documented goals-of-care discussions using a validated codebook. This study demonstrates the benefits of a hospital-based implementation of the SICP to improve goals-of-care conversations.

Morning Poster Presentations - Quality Improvement

The McMaster Medical Compendium: Re-imagining medical education through a student-led initiative of self-directed learning and mentorship

***Maxwell C. Ng** (1), Andrew Costa (2)

(1) Undergraduate Medicine, McMaster University, Kitchener, Ontario, Canada
(2) Waterloo Regional Campus Research Department, McMaster University, Kitchener, Ontario, Canada

Every medical student faces the daunting scale of medical literature, known as 'drinking from a firehose'. Limited in time, students must seek clinically-relevant information appropriate to their level of training. However, learning can be challenged by resources written at inaccessible levels, with key concepts hidden in the content. To address these needs, the McMaster Medical Compendium (MMC) was initiated with two primary objectives: (i) to enhance self-directed learning, and (ii) to support student mentorship.

The MMC is a publication that introduces students to a plethora of relevant diseases and therapeutics. Content was categorized based on organ system, with article topics selected by prevalence, severity, or ability to illustrate critical concepts. For the first objective (Self-directed Learning), articles were subsequently researched, written, and edited by students. Regarding objective two (Mentorship), students with strong interests or experiences in the subject acted as editors, mentoring authors by advising on high-yield topics to cover and providing feedback on writing. Post-edited articles are then reviewed by physicians, ensuring information relevance and appropriateness to clinical practice, with direct feedback for the editors.

The MMC is an on-going project, designed to continue providing opportunities for students long into the future. It uses a unique presentation format designed for medical student comprehension. At the current time of writing, multiple articles have been written and edited by students, ranging from "Staphylococcus aureus" to "Myocardial Infarction" to "Acromegaly". Furthermore, physicians have been reviewing and providing feedback on the work (e.g. "Mitochondrial Diseases").

The MMC has become an adjunct to medical education, collaborating at all levels of the McMaster University medical program. The MMC also connects students with common interests, facilitating further mentorship and creativity beyond content-creation. Future plans involve developing this resource for other health professionals and patients.

Morning Poster Presentations - Quality Improvement

Gender disparities in pediatric critical care research

***Grace M. Xu**(1), Saskia N. de Wildt(2,3), Samara Zavalkoff(4,5), Mark Duffett, PhD RPh(6,7)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada.
(2) Department of Pharmacology and Toxicology, Radboud University, Nijmegen, the Netherlands.
(3) Intensive Care and Department of Pediatric Surgery, Erasmus MC Sophia, Rotterdam, the Netherlands.
(4) Division of Critical Care, Montreal Children's Hospital, McGill University Health Centre and Research Institute, Montréal, Quebec, Canada.
(5) Department of Pediatrics, McGill University, Montreal, Quebec, Canada.
(6) Department of Pediatrics, McMaster University, Hamilton, Ontario, Canada.
(7) McMaster Children's Hospital, Hamilton, Ontario, Canada.

Background: Female researchers, in many areas of science, continue to secure less grant funding, author fewer publications, and do fewer podium presentations than male researchers. Women constitute nearly half of the physicians and the majority of nurses in the pediatric critical care workforce but the gender demographics of pediatric critical care clinical researchers are unknown. Our objective was to compare the productivity and impact of female and male researchers in pediatric critical care.

Methods: We included the authors of randomized controlled trials (RCTs) in pediatric critical care published prior to April 2018. We used social security and census data to classify authors' first names as male or female.

Results: We included 1875 authors of 378 RCTs (published 1986-2018) and classified the names of 1509 (80%) authors. Overall, 35% (95% CI 33-37%) of authors were women. First and last authors were 36% (95% CI 31-42%) and 23% (95% CI 19-28%) women, respectively. The most frequent professions were physicians (60%), academics (8%), and nurses (6%)—of which 28%, 43% and 96%, respectively, were women. The percentage of female authorship overall (28% in 1985-1989 to 35% in 2015-2018, $p=0.016$) and as last authors has increased over time (0% in 1989-1990 to 32% in 2015-2018, $p=0.011$). RCT characteristics showed no statistically significant differences published with either a female first or last author versus those with both male authors. RCTs by female authors were cited less often overall (median 17 vs. 31 citations, $p<0.001$), but not when adjusted for the years since publication (median 2 vs. 3 citations per year, $p=0.21$).

Conclusion: Women still represent a minority of published pediatric critical care researchers and their trials are similar in characteristics and impact as male researchers. Further work should identify barriers to gender diversity in pediatric critical care research and potential solutions.

Morning Poster Presentations - Community

The healthcare experiences of adults with substance use disorders in the perinatal period

***Erica Sacoransky**, ***Franciska K. Shaw**

Department of Undergraduate Medicine, McMaster University, Hamilton, Ontario

This is a retrospective cohort study. The participants will include adults (≳18y) who were addicted to substances during the perinatal period (20th week of gestation to 4 weeks after birth) in Hamilton and Kitchener-Waterloo, Ontario. Interviews will be conducted over a 3-month-period. Through descriptive thematic data analysis, we expect this project to identify common themes regarding barriers that adults with substance use disorders face within the healthcare system during the perinatal period.

6 adults (≳18 years of age) who were addicted to substances during the perinatal period (20th week of gestation to 4 weeks after birth) from outpatient settings in Canada will be interviewed via a retrospective cohort study over a 3-month-period. Interviews will consist of open-ended and focused questions and will be conducted in a secure location or via a secure video conferencing website. Interviews will be reviewed and coded based on the common themes identified during the interview process. Common experiences will be identified through descriptive thematic analysis

Results are yet to be obtained.

Conclusions and impact will be discussed after completion of data collection and analysis. This study will help to identify common themes in order to increase awareness of the difficulties and barriers faced by adults with substance use disorders during the perinatal period in order to inform practice recommendations to improve perinatal healthcare access and quality for adults with substance use disorders.

Morning Poster Presentations - Community

Traumatic Recreational Eye Injuries and the PROTECT Initiative

***Keean Nanji** (1), Imaan Kherani (1), Ammar Mahmood (2), April Ingram (2), Alex Platt (3), Amin Kherani (2)

(1) Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada
(2) Department of Ophthalmology, University of Calgary, Calgary, Alberta, Canada
(3) Department of Ophthalmology, University of Alberta, Edmonton, Alberta, Canada

Although 90% of recreational ocular injuries are preventable, Canadian individuals still sustain eye trauma resulting in lifelong visual impairment (Napier et al., 1996). Currently, protective eyewear is available, yet compliance is variable (Gordon, 2012). Increased public and health professional awareness regarding necessary preventative measures for eye injuries is warranted, especially with Canadian's emphasis on active lifestyles without strict ocular protection mandates (Gordon, 2012). The Prevention of Recreational Ocular Trauma by Educating the Community Together (PROTECT) project aims to disseminate information regarding the sequela of improper eye protection during recreational activities through community presence and social media. In order to best advocate for ocular injury prevention and focus future efforts, an updated literature search is needed.

An electronic systematic literature search of Ovid, Cochrane and PubMed was conducted. Two reviewers independently assessed titles and abstracts with defined inclusion criteria. Disagreements were resolved via discussion.

The literature search yielded 183 unique papers, of which 35 were selected for inclusion. Information was extracted and classified according to key questions regarding current preventative strategies, etiology, epidemiology, prognosis, and management of traumatic recreational eye injuries.

Essential to propelling PROTECT's advocacy plan forward, this investigation outlines results of a systematic literature search regarding Canadian recreational eye injuries. The results indicate a pressing need to raise awareness regarding the severity of ocular injuries that can occur when individuals fail to wear proper eye protection. Hence, future steps now include a multicentre chart review of recreational ocular injuries, advocacy campaigns on preventative strategies, utilizing social media outlets to reach the general public, and a survey based observational analysis examining the effectiveness of PROTECT's advocacy measures.

Morning Poster Presentations - Community

A narrative account of the experiences of people who use drugs while under hospital care in Hamilton, Ontario

***Sejal Joshi** (1), Dr. Robin Lennox (2), Dr. Tim O'Shea (3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Department of Family Medicine, McMaster University, Hamilton, Ontario, Canada
(3) Department of General Internal Medicine and Infectious Disease, McMaster University, Hamilton, Ontario, Canada

Studies have shown that many healthcare providers (HCPs) hold negative attitudes towards people who use drugs (PWUD). This stigmatization negatively affects health outcomes, due to lack of trust in the therapeutic alliance and minimization of physical illness symptoms in the context of the patient's substance use history. It has also been shown to act as an overall deterrent for PWUD to seek further care. Hamilton has experienced a significant increase in opioid-related deaths – 87 deaths in 2017 compared to 52 in the previous year – with an opioid-related death rate that is 72% higher than the provincial average.

Therefore, our study aims to investigate the interactions between HCP and PWUD within Hamilton. This may draw our attention to instances and patterns where PWUD are misunderstood by their HCP for their substance use, which may subsequently deter them from further interactions with the healthcare system. We asked participants about potential strategies to better serve PWUD while in hospital. Findings and proposed solutions to problems identified through this study will be brought forward to the HCP's of Hamilton, in hopes of preventing the negative perceptions and practices of HCP towards PWUD in the future.

This was a mixed methods qualitative study using brief surveys and semi-structured interviews. Each participant completed a demographic survey, and then partook in a semi-structured interview with a study investigator. Interviews were recorded and transcribed. A chart review of Dovetale and Meditech was completed to determine the number of hospital encounters the participants had in the last 12 months, as well as descriptive information around the current admission. Discrete measures were then used to generate descriptive statistics, and transcribed interview data was coded and subjected to thematic analysis with NVivo software.

Results and conclusions are still pending.

Morning Poster Presentations - Community

Effect of seasonal influenza vaccination on influenza severity in Hutterite communities: Follow-up study of a randomized trial

***Shannon E. Brent** (1), Eleanor Pullenayegum (2), Mark Loeb (1)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) The Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada

Seasonal influenza causes significant morbidity and mortality globally. Vaccine failure is defined as influenza occurring despite receipt of the influenza vaccine. We investigated whether influenza vaccination reduces severity of illness in the setting of vaccine failure, and whether this association differs between influenza vaccine formulations (inactivated (IIV) vs. live-attenuated (LAIV)).

We performed a retrospective cohort study using data from two blinded cluster-randomized control trials of influenza vaccine in Hutterite colonies. In trial 1, children received either IIV or hepatitis A vaccine (4). In trial 2, children received either LAIV or IIV. Community members with symptoms of influenza-like illness were tested for influenza using polymerase chain reaction. We assessed four outcomes (total number of symptoms, number of respiratory symptoms, number of systemic symptoms, and duration of symptoms) among those with confirmed influenza. We utilized Welch two-sample t-tests to quantify the relationship between vaccine group (IIV vs. Hep A, LAIV vs. IIV) and outcome. We performed multivariable strain-specific analyses, controlling for age.

IIV vs. Hep A vaccine: Among those with confirmed infection, vaccine type did not significantly affect the number of total, respiratory, or systemic symptoms, or the duration of illness ($p>0.05$ for all outcomes). LAIV vs. IIV: LAIV recipients experienced fewer total ($p<0.001$, 95% CI: 0.52 – 1.21), respiratory ($p<0.001$, 95% CI: 0.188 – 0.579), and systemic symptoms ($p<0.001$, 95% CI: 0.262 – 0.705), and a shorter duration of illness ($p=0.007$, 95% CI 0.270 – 1.73), compared to IIV recipients. LAIV conferred a protective effect for infections caused by influenza B or A/H1N1, but not influenza H3.

Receiving the seasonal influenza vaccine did not attenuate the course of disease in the context of vaccine failure. Our results challenge the widely held dictum that influenza vaccine reduces the severity of illness even when the vaccine fails to prevent influenza.

Afternoon Poster Presentations - Basic Science

Development of a novel peptide mimetic therapeutic for respiratory syncytial virus

***Christopher K.W. Chiang** (1), James Mahony (2)

(1) Michael G. DeGroote School of Medicine – Waterloo Regional Campus, McMaster University, Kitchener, Ontario, Canada.
(2) Michael G. DeGroote Institute for Infectious Disease Research, Faculty of Health Sciences and Department of Pathology and Molecular Medicine, McMaster University, Hamilton, Ontario, Canada.

Respiratory syncytial virus (RSV) is one of the leading causes of acute lower respiratory tract infection and childhood hospitalizations worldwide. However, there are currently no vaccines or antivirals available to prevent or treat RSV infections. Of the 11 proteins encoded by RSV's negative-sense single-stranded RNA genome, the nucleoprotein, phosphoprotein, and large polymerase interact through well-characterized domains to form the RNA-dependent RNA polymerase complex. This polymerase complex is essential for viral replication and virulence, which makes it an excellent antiviral target. Previous studies have shown that the nucleoprotein-phosphoprotein interaction of the polymerase complex can be disrupted by synthetic peptides of the first 29 N-terminal amino acids of the phosphoprotein ($P_{1\text{-}29}$). However, it has not been assessed in vitro. Thus, this study aims to build on these findings by developing and evaluating the efficacy of a $P_{1\text{-}29}$ peptide mimetic conjugated to Escherichia coli maltose binding protein (MBP) in inhibiting RSV replication in vitro.

Inverse PCR and In-Fusion® cloning were used to clone plasmids containing peptide mimetics conjugated to MBP, which were then expressed and purified with affinity chromatography for functional analysis. MBP-$P_{1\text{-}29}$ construct did not exhibit significant cytotoxicity in LLC-MK2 cells nor BEAS-2B cells. Upon challenge with RSV A, LLC-MK2 cells and BEAS-2B cells pre-treated with MBP-$P_{1\text{-}29}$ demonstrated a dose-dependent inhibition of RSV replication in vitro, with a percent inhibition of infection of up to 80% and 60% respectively. Furthermore, MBP-$P_{1\text{-}29}$ also reduced the release of infectious progeny virion by up to 74% in LLC-MK2 cells and 34% in BEAS-2B cells.

In this study, a $P_{1\text{-}29}$ peptide mimetic attached to MBP was effective in significantly reducing RSV replication in vitro. Moving forward, further studies are required to evaluate its efficacy against different RSV strains and to replace MBP with a human carrier protein.

Afternoon Poster Presentations - Basic Science

Interaction between NBEAL2 and P-selectin.

***Darren B. Chai**(1), Fred G. Pluthero(1), Ling Li(1), Walter H. Kahr (1,2,3)

(1) Program in Cell Biology, The Hospital for Sick Children, Toronto, Ontario, Canada
(2) Department of Biochemistry, University of Toronto, Toronto, Ontario, Canada
(3) Division of Haematology/Oncology, The Hospital for Sick Children, Toronto, Ontario, Canada.

Platelets are tiny, abundant blood cells derived from megakaryocytes (MKs) that play essential roles in hemostasis and thrombosis. Following injury, stimulation of platelet surface receptors leads to secretion of adhesive molecules, coagulation and growth factors, many carried in α-granules, the most abundant platelet secretory vesicles. Granule cargo includes both proteins synthesized by MKs and proteins that are endocytosed by MKs or platelets. NBEAL2 is a 240 kDa protein with many putative interaction domains. It is highly expressed by MKs, and loss-of-function mutations in NBEAL2 cause Grey Platelet Syndrome (GPS), characterized by thrombocytopenia, myelofibrosis, splenomegaly and platelets that are abnormally large and lack full-formed α-granules and their cargo. P-selectin is an α-granule-specific membrane-associated protein that is released from α-granules during coagulation. Previous data suggested that P-selectin and NBEAL2 are interaction partners. Our aim was to validate and characterize the nature of this interaction.

We co-expressed NBEAL2 and P-selectin in HEK293 cells and performed reciprocal co-immunoprecipitation assays with the lysates. Further, we cloned two constructs of P-selectin for future studies in determining the domains pertinent to its interaction with NBEAL2.

We found that P-selectin is present NBEAL2 immunoprecipitation assays. Further, we used sanger sequencing to validate our constructs—isolating the extracellular and c-terminal domain of P-selectin.

These results suggest that NBEAL2 and P-selectin are interaction partners. This data helps clarify how NBEAL2 is involved in α-granule biogenesis, platelet development and function.

Afternoon Poster Presentations - Basic Science

Exploring Interoception

***Hannah Kearney**, Kaian Unwalla, David I. Shore

Department of Psychology, Neuroscience & Behaviour, McMaster University, Hamilton, Ontario, Canada

Body ownership is a complicated and multifaceted percept. Although we subjectively perceive body ownership to be a stable component of our identity, recent work has illustrated that body ownership is a dynamic construct that is constantly updated by the integration of current endogenous and exogenous body-related information.

The goal of this study was to explore the relation between these endogenous (interoceptive) and exogenous (exteroceptive) channels of information. We investigated this by using a heartbeat perception (HBP) task to measure interoceptive accuracy, and the Rubber Hand Illusion (RHI) to measure malleability of body ownership. Based on prior findings, we hypothesized that the less accurate you were at counting your heartbeats, the more susceptible you would be to the RHI (i.e. the more malleable your sense of body ownership wouldbe). In addition, we were also interested in exploring the relationship between interoception and emotion recognition ability (ERA).

In this experiment, we failed to induce the RHI, and thus could not investigate the relationship between endogenous and exogenous body-related information. However, we successfully demonstrated the reliability of the interoceptive accuracy HBP task, as well as demonstrated that interoceptive accuracy was not related to ERA or self-reported interoceptive awareness. In addition, this study demonstrated that there are no sex differences in interoceptive accuracy.,
These results represent the interindividual differences of a very small sample with unbalanced sex groups. Additional research is needed to fully explore the multidimensionality of interoception, and to discover the mechanisms that drive the different facets of interoception. This paper prompts the importance of the continued study of these cognitive processes, as they shape how we navigate the world and interact with those around us.

Afternoon Poster Presentations - Basic Science

Myelin-related protein expression and oligodendrocyte-lineage cell populations in the uncinate fasciculus of depressed suicides

***John Kim** (1,2,4), Meghan Shaw (1,2,4), Arnaud Tanti (1,5), Dominique Mirault (1,5), Daniel Almeida (1,2,4), Rachel Toope (1,4), Maria Antonietta Davoli (1,2,4), Naguib Mechawar (1,3,4,5)

(1) McGill Group for Suicide Studies
(2) Integrated Program in Neuroscience
(3) Department of Psychiatry
(4) McGill University
(5) Douglas Mental Health University Institute

Major depressive disorder (MDD) is a mental illness that affects over 300 million people globally. Suicide is significantly associated with depression and the majority of people who die by suicide have been diagnosed with MDD. Early life adversity, such as child abuse (CA), is also strongly associated with the manifestation of depressive symptoms and an increased risk for suicide. While our group has previously characterized cellular and molecular alterations in frontal cortical white matter associated with CA, it remains unknown if white matter association tracts display similar deficits. The uncinate fasciculus (UF), a corticolimbic tract implicated in memory and socioemotional processing; interestingly, this tract connects cortical and limbic brain regions that are known to be associated with MDD or CA. Many brain imaging studies have shown that white matter integrity is impaired in the UF of MDD patients and subjects with a history of CA.

We investigated the cellular and molecular organization of the UF by examining the expression of myelin-constituent mRNA and proteins, as well as the morphology and cell density of oligodendrocyte-lineage cells in post-mortem UF tissue.

We found that the white matter of the UF displayed none of the cellular or molecular abnormalities that we had previously uncovered in anterior cingulate cortex (ACC) and ventromedial prefrontal cortex (vmPFC) white matter. Our subjects showed no differences in oligodendrocyte-lineage cell density or morphology and myelin-constituent gene and protein expression. When pooling our DS and DS-CA subjects, we found trends towards reduced MOG mRNA and elevated PLP protein in depressed suicides.

Our results suggest that a history of CA is not associated with global changes in white matter throughout the brain, and that different white matter areas display very different oligodendrocyte development and myelin-constituent protein expression patterns in the context of CA.

Afternoon Poster Presentations - Basic Science

Maternal diet-induced obesity (mDIO) alters maternal and fetal hepatic gluconeogenesis at embryonic day 14.5

***Yu Fei Xia**(1), Jessica G. Wallace(1,2), and Deborah M. Sloboda(1,2,3)

(1) Department of Biochemistry and Biomedical Sciences, McMaster University, Hamilton, Canada.
(2) Farncombe Family Digestive Health Research Institute, McMaster University, Hamilton, Canada
(3) Department of Obstetrics and Gynaecology and Pediatrics, McMaster University, Hamilton, Canada.

Maternal obesity is associated with an increased risk of offspring metabolic dysfunction and fatty liver in adulthood, likely due to changes in fetal hepatic development during intrauterine nutritional stress. Since hepatic lipotoxicity has been linked to gluconeogenic changes in clinical and animal studies, we hypothesized that mDIO would impose significant changes in fetal hepatic gluconeogenic signalling that could be associated with a postnatal fatty liver phenotype.

Female C57BL/6 mice were fed a standard control diet (CON; 17% kcal fat; n=10) or a high fat diet (mDIO,60% kcal from fat; n=10) for 6 weeks prior to and throughout gestation. Maternal and fetal hepatic tissue was collected on embryonic day (E)14.5 and transcript levels of key liver gluconeogenic enzymes were investigated by RT-qPCR. Fixed maternal hepatic sections were also investigated for evidence of steatosis.

mDIO increased maternal blood glucose and serum insulin and leptin levels compared to CON mothers at E14.5. mDIO reduced maternal hepatic cytosolic phosphoenolpyruvate carboxykinase (PEPCK) mRNA levels ($p<0.0001$), hepatic nuclear factor 4 alpha (HNF4α) mRNA, a known transcription activator of PEPCK ($p=0.0004$), and upstream insulin receptor substrate 2 (IRS2) ($p=0.0018$) compared to CON mothers. mDIO also decreased mRNA levels of fetal PEPCK ($p=0.0068$) and pyruvate carboxylase (PCx) ($p=0.0003$). Preliminary histological analyses suggest that maternal liver shows evidence of lipid deposition after mDIO.

mDIO is associated with a downregulation of mRNA transcript levels of key gluconeogenic enzymes in the maternal and fetal liver at E14.5. We speculate that this is likely due to an overabundance of triglycerides and altered maternal-fetal glucose gradient. These measures are the subject of ongoing experiments. Lipid metabolism and protein quantification of gluconeogenic factors are currently being investigated.

Afternoon Poster Presentations - Clinical Science

Appendectomy in surgical management of mucinous ovarian neoplasms

***A. Dubey** MSc(1), A. Salehi MD PhD(2), L. Eiriksson MD MPH(3,4)

(1) Michael G. DeGroote School of Medicine, McMaster University
(2) Department of Pathology and Molecular Medicine, McMaster University
(3) Department of Clinical Epidemiology and Biostatistics, Department of Surgery, McMaster University
(4) Division of Gynecological Oncology, Department of Obstetrics & Gynecology, McMaster University

Introduction: Mucinous ovarian neoplasms (MON) account for approximately 20-25% of all ovarian tumours and less than 5% are classified as malignant. These tumours are characterized by invasion of ovarian stroma, with large amounts of intracellular mucin and the presence of multicystic tumours. However, histologically, they are similar to appendiceal malignancies which can result in difficulties identifying their origin. A routine appendectomy is often included during the surgical management of a MON to rule out an occult gastrointestinal malignancy. However, the risks and benefits are often debated since it can result in complications such as hemorrhage, peritonitis, intraabdominal abscess, intestinal obstruction and increases in operating room costs. Therefore, our study aims to assess the involvement of the appendix in patients with MONs.

Methods: A retrospective chart review was performed using electronic medical records of patients with mucinous ovarian neoplasms treated at the Juravinski Cancer Centre. Cases were eligible if there was appendectomy performed at the time of initial surgical management, which span of an 18-year period from 2000-2018. Pathological findings of the appendix will be identified and categorized based on frozen section reporting and final histopathology of the ovarian neoplasm. Categorical variables were summarized with counts and percentages.

RESULTS: A total of 200 cases were analyzed as part of the preliminary results for this study. Of these, 196 cases had a diagnosed MON (benign, borderline or malignant) and underwent appendectomy as part of their surgical management. Only 24 (12.24%) of the 196 cases had an appendiceal pathology, including primary disease (20 of 24) or metastasis (4 of 24) from ovarian origin.

CONCLUSIONS: Overall, these preliminary results are consistent with current literature to suggest that the prevalence of appendiceal pathology in the context of mucinous ovarian neoplasms remains low, bringing into question the need for a routine appendectomy during surgical management.

Afternoon Poster Presentations - Clinical Science

Clinical Outcomes of Intravitreal Bevacizumab compared to Laser Photocoagulation in Retinopathy of Prematurity: 11-Year Retrospective Study

Dr. Prima Moinul(1), Dr. Varun Chaudhary(1), ***Ashlyn Pinto**(2), Dr. Gloria Isaza(1)

(1) Department of Ophthalmology, McMaster University, Hamilton, Ontario
(2) Michael DeGroote School of Medicine, McMaster University, Hamilton, Ontario

Retinopathy of prematurity (ROP) is abnormal vasoproliferative retinal growth during prematurity. Laser photocoagulation (LP) is the gold standard treatment, but can lead to retinal damage and high myopia. VEGF inhibitors, such as intravitreal bevacizumab (IVB), have recently been used to halt neovascularization in ROP. This study determined the efficacy and complications of patients treated with LP compared to IVB.

Type 1 ROP treated patients at McMaster Children's Hospital between 2007 and 2018 were analyzed. The Canadian Neonatal Network and medical charts were used to collect gender, gestational age (GA), birth weight (BW), postmenstrual age (PMA), ROP zones and stages at treatment, complications, retreatment, refractive error (RE) and visual acuity (VA). Patients were classified by LP or IVB treatment.

165 eyes of 83 patients were analyzed. 56/165 (33.9%) eyes received LP, while 109/165 (66.1%) eyes received IVB. Mean GA, BW and PMA at treatment time were not significant between groups ($p=0.399$, $p=0.868$ and $p=0.250$, respectively). 15/56 (26.8%) of LP eyes and 39/109 (35.8%) of IVB eyes had zone 1, stage 3 ROP, while 41/56 (73.2%) LP eyes and 70/109 (64.2%) IVB eyes were zone 2, stage 3 ROP. ROP regressed in 52/56 (92.3%) LP eyes and 103/109 (95.4%) IVB eyes after monotherapy. 4/56 (7.1%) LP eyes and 5/109 (4.6%) IVB eyes received retreatment. Central retinal vein occlusion and peripheral retinal traction acutely occurred in two LP patients. RE and refractive average age were -2.5D (range: -10D to +2.25D) at 8.8 months in LP eyes and 0.8D (-5D to +3.5 D) at 7.8 months in IVB eyes ($p=0.04$). The VA and VA average age were 20/50 at 2.9 years in LP eyes and 20/32 in IVB eyes at 2.6 years ($p=0.04$).

Both LP and IVB treatment successfully regressed Type 1 ROP with minimal complications. Myopia and VA were worse among LP than IVB treated patients.

Afternoon Poster Presentations - Clinical Science

Reporting Outcomes and Outcome Measures in Open Rhinoplasty: A Systematic Review

Yusuf Hassan (1), ***Cameron F. Leveille** (2), Lucas Gallo(3), Jenny Santos (3), Achilleas Thoma (3,4), Mark H. McRae (3), Matthew C. McRae (3)

(1) Faculty of Health Sciences, McMaster University.
(2) Michael G. DeGroote School of Medicine, McMaster University.
(3) Division of Plastic Surgery, Department of Surgery, McMaster University; Hamilton, Ontario.
(4) Department of Health Research Methods, Evidence and Impact (HEI)

Comparative studies have shown little statistical difference in outcomes following rhinoplasty, demonstrating near equivalent results across all surgical techniques. Cross-study comparisons of these trials are difficult as variation in outcome reporting prevents statistical pooling and analysis. Therefore the objective of this study is to identify all outcomes and outcome measures used to evaluate postoperative results in rhinoplasty.

An extensive computerized database search of MEDLINE and EMBASE was performed; all trials involving n≥20 patients, aged 18 and older undergoing a primary, open rhinoplasty procedure, were included for review.

Of the 3235 citations initially screened, 72 studies met the stated inclusion criteria. 53 unique outcomes and 55 postoperative outcome measures were identified. Outcomes were divided into 6 unique domains: objective signs, subjective symptom severity, physical function related to activities of daily living, patient satisfaction, surgeon satisfaction, and quality of life. Outcome measures identified consisted of 5 nasal specific, author-reported instruments; 5 nasal specific, patient-reported instruments; 5 patient-reported, generic instruments; and 40 author-generated instruments. Of the outcome measures identified, the Rhinoplasty Outcomes Evaluation (ROE-Q), Sino-Nasal Outcome Test-22 (SNOT-22) and the FACE-Q were the only instruments to demonstrate adequate validity, reliability and responsiveness to change in patients undergoing a rhinoplasty procedure.

There is heterogeneity in the outcomes and outcome measures used to assess post-surgical outcomes following rhinoplasty. A standardized core outcome set is urgently needed to make it possible for future investigators to compare results of various techniques in rhinoplasty surgery.

Afternoon Poster Presentations - Clinical Science

Cannabis and Methadone Maintenance Treatment for Opioid Use Disorder: A Systematic Review and Meta-Analysis

Heather McBrien (1), ***Candice Luo** (2), Nitika Sanger (3), Laura Zielinski (4), Meha Bhatt (5), Xi Ming Zhu (6), David Marsh (7), Lehana Thabane (8, 9), Zainab Samaan (9, 10)

(1) Statistical Sciences Program, University of Toronto, Toronto, Canada.
(2) Michael G. DeGroote School of Medicine, Hamilton, Ontario, 1280 Main Street West, Hamilton, ON L8S 4L8, Canada
(3) Medical Science Graduate Program, McMaster University, 1280 Main Street West, Hamilton, ON L8S 4L8, Canada.
(4) MiNDS Neuroscience Graduate Program, McMaster University, 1280 Main Street West, Hamilton, ON L8S 4L8, Canada.
(5) Health Research Methodology Graduate Program, McMaster University, 1280 Main Street West, Hamilton, ON L8S 4L8, Canada.
(6) St. George's Hospital Medical School, University of London, London, United Kingdom.
(7) Northern Ontario School of Medicine, Ramsay Lake Road, Sudbury, Ontario P3E 6H6, Canada.
(8) Biostatistics Unit, Research Institute at St Joes, St. Joseph's Healthcare Hamilton, 50 Charlton Avenue E., Hamilton, ON L8N 4A6, Canada.
(9) Department of Health Research Methods, Evaluation, and Impact, McMaster University, Hamilton, Canada
(10) Department of Psychiatry and Behavioural Neurosciences, McMaster University, 1280 Main Street West, Hamilton, ON L8S 4L8, Canada.

The ongoing opioid epidemic is one of the most important concerns of public health. Although methadone maintenance therapy (MMT) is the most common treatment for OUD, its effectiveness is inconsistent between populations. There is also lack of evidence of the effectiveness of MMT for patients that are using other substances simultaneously. With rates of cannabis use among patients on MMT being high, it is important to understand the impact of cannabis on MMT treatment outcomes. This review examined the effect of cannabis on continued opioid use of patients on MMT.

We searched Medline/PubMed, EMBASE, PsycINFO, and CINAHL from inception to July 2018. The effects of cannabis use on illicit opioid use and polysubstance use during MMT, as well as MMT treatment retention were summarized. We used a random effects model to conduct meta-analyses of those primary outcomes.

We included 23 studies in our review and six studies of the 23 were included in the meta-analysis. A total number of 3676 participants were meta-analyzed examining cannabis and illicit opioid use during MMT. The results showed that cannabis use did not reduce opioid use during MMT (OR 0.39, 95% CI 0.09, 1.79, p=0.23). Cannabis use also did not impact treatment retention. Due to the nature of observational studies, the overall quality of evidence was very low, with a high risk of bias.victoria

We found no evidence to suggest that cannabis helps patients with opioid cessation. Despite the methodological limitations of included studies, our study had a large sample and we used rigorous systematic review methods to provide the best and most updated data on the association between cannabis and opioid use in this population.

Afternoon Poster Presentations - Clinical Science

Physicians' opinions and patients' treatment outcomes following genetic testing for psychiatric medications

Connor M. Lewicki* (1), Trehani M. Fonseka (2), Dr. Arun K. Tiwari (2), Victoria S. Marshe (1), Nicole Braganza (2), Dr. James L. Kennedy (3), Dr. Daniel J. Mueller (3)

(1) Institute of Medical Science, University of Toronto, Toronto, Ontario, Canada
(2) Campbell Family Mental Health Research Institute, Centre for Addiction and Mental Health, Toronto, Ontario, Canada
(3) Department of Psychiatry, University of Toronto, Toronto, Ontario, Canada,

Pharmacogenetics is a promising component of personalized medicine which involves genotyping drug response and metabolism genes to individualize pharmacotherapy. Barriers including lack of knowledge among healthcare providers have so far limited its clinical uptake. IMPACT is a program aiming to make pharmacogenetics understandable and convenient in primary care. This study sought to evaluate the effectiveness of a pharmacogenetics program focusing on psychiatric illnesses by assessing physicians' opinions, patients' outcomes, and acceptance of the program.

Primary care physicians who have had the opportunity to genotype their patients and adjust pharmacotherapy accordingly were emailed the Pharmacogenetics in Psychiatry Follow-up Questionnaire (PIP-FQ) survey 6–8 weeks after receiving the genetic report. Likert scales measuring understanding and other opinions were completed. Questions about patient illness severity, improvement following treatment change, and side effects were completed based on the Clinical Global Impression Scale. Surveys were collected from 2009 to 2016.

The response rate was 61.8% with 383 physicians returning surveys. Physicians were pleased with the report received, with 90.6% saying it was understandable. Of patients whose treatment changed, 56.9% were reported to show improvement, and 42.3% of patients with side effects showed improvement. Physician specialty was associated with significant differences in understanding and opinions on the future of pharmacogenetics (both $P < .01$). Geographic location was associated with differences in report usefulness ($P = .033$) and opinions of pharmacogenetics' future ($P < .01$).

Delivered effectively, physicians consider pharmacogenetics information and see positive results. Pharmacogenetics programs can be successful for psychiatric medications in the primary care setting. Certain physician demographic characteristics may have an effect on opinions and utility of genetic information.

Afternoon Poster Presentations - Clinical Science

Determining the effects of return to activity and return to school guidelines on children with concussion: A systematic review.

***E. Dimitra Bednar**(1), Carol DeMatteo(2), Sarah Randall(2)

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

Concussion is a mild traumatic brain injury (mTBI) resulting in neurological and cognitive deficits. It is a common childhood injury. Concussion has a highly variable clinical presentation and prognosis, and individualized management programs are recommended. Gradual return to school (RTS) and return to activity (RTA) guidelines have been established, but they are currently based on expert consensus. There is a lack of evidence to support these guidelines and a lack of evidence to evaluate their effectiveness.

The objective of this systematic review will be to summarize and evaluate the effects of following RTA/RTS guidelines on clinically meaningful outcomes for children with concussion. Results of this review will ultimately provide evidence to create evidence-based guidelines for concussion management in children.

A systematic search of the literature will be conducted in PUBMED and MEDLINE. The student will screen titles and abstracts for eligible records and will screen in parallel with a second reviewer. Retrieved articles will also have their reference lists checked. Studies will be eligible if RTA/RTS guidelines were used for children aged 5 to 18 years with a clinically diagnosed concussion. Studies must be published in English. The mechanism of injury of concussion can be from any route; it does not have to be sport-related. Studies will be excluded if children had severe traumatic brain injuries or had other neurological impairments. Included studies will have their quality assessed and the GRADE approach will be used to determine quality of the summarized evidence.

This project will address a current gap in the literature by evaluating the effects of RTA/RTS guidelines for children with concussion on outcomes including symptomatology, academic success, and quality of life, and will then be used to formulate evidence-based guidelines for the clinical management of pediatric concussion.

Afternoon Poster Presentations - Clinical Science

A Review Evaluating Retinal Detachments Post Endophthalmitis

***Keean Nanji** (1), Varun Chaudhary (1), Geoff Williams (2), Amin Kherani (2)

(1) Department of Surgery, Division of Ophthalmology, McMaster University, Hamilton, Ontario, Canada
(2) Department of Ophthalmology, University of Calgary, Calgary, Alberta, Canada

Endophthalmitis is an inflammatory condition in the eye, involving the vitreous and/or the aqueous humour. Retinal detachments can occur as a complication of the endophthalmitis or of the surgical procedures used in an attempt of its treatment. The purpose of this review was to address a gap in the current literature and report on the incidence, management approach and outcome of cases of retinal detachment subsequent to endophthalmitis.

A retrospective consecutive chart review of patients who presented to the Calgary Retina Consultants, Southern Alberta Eye Center and the Rockyview General Hospital, Calgary since 2008 were reviewed. Cases were included if individuals were diagnosed with endophthalmitis and subsequently developed a retinal detachment requiring surgical intervention in the same eye.

134 cases of endophthalmitis met our inclusion criteria, 12 of which subsequently developed a retinal detachment. The predisposing events for the endophthalmitis were surgery (41%), injection (38%), endogenous causes (11%) and trauma (4%). The endophthalmitis was managed via tap and inject (20%), vitrectomy (31%) or with both (39%). There was a significant difference in the LogMAR conversions of BCVA between the group developing a retinal detachment and the group that did not at endophthalmitis presentation and after treatment. All 12 cases of retinal detachments were treated with a vitrectomy, three of the cases also were treated with a scleral buckle. Four of these cases required additional surgeries due to recurrent detachments, proliferative vitreoretinopathy and/or requiring a prosthesis.

Retinal detachments post endophthalmitis are complex due to the severe inflammatory reaction, associated vitreoretinal changes and multiple factors involved in the causation. Despite these issues, repair of these detachments can help preserve some vision and be globe saving. Future steps include reviewing a similar cohort at the Hamilton Regional Eye Institute and St. Michael's Hospital in Toronto to provide a multicentre perspective.

Afternoon Poster Presentations - Clinical Science

Involvement of the Posterior Intracranial Circulation in Giant Cell Arteritis

***Keean Nanji** (1), Laura C. Donaldson (1), Ryan Rebello (2), Nader Khalidi (3), Amadeo R Rodriguez (1)

(1) Department of Surgery, Division of Ophthalmology, McMaster University, Hamilton, Ontario, Canada
(2) Department of Radiology, McMaster University, Hamilton, Ontario, Canada
(3) Department of Rheumatology, McMaster University, Hamilton, Ontario, Canada

Giant cell arteritis (GCA) is the most common primary vasculitis affecting the elderly population. Classically, GCA preferentially involves the extracranial branches of the carotid artery with sparing of intracranial vessels (Wilkinson and Russell, 1972). Occlusive vasculitis or embolization of inflammatory thrombus can result in ischemic stroke, found in approximately 2-4% of GCA patients. One series reported an incidence of 2.8%, with the majority localizing to the posterior circulation and found that vertebrobasilar stroke was often accompanied by arteritic anterior ischemic optic neuropathy (Gonzalez-Gay et al., 2009). This study determined the incidence of posterior intracranial vasculitis in a large series of patients with GCA undergoing contrast-enhanced MRI focused on intra- and extracranial vessels.

This was a retrospective chart review utilizing a prospective database of GCA patients. 197 patients evaluated for probable or confirmed GCA between 2015 and 2018 were included. MR images were reviewed and positive findings verified by a single neuroradiologist (RR).

Of 197 patients, 167 had a contrast-enhanced MRI of the head. 55 patients had evidence of vasculitis, 12 were temporal artery biopsy-positive and 43 were biopsy-negative or unknown. Overall, 5 patients showed probable or definitive involvement of both the anterior and posterior intracranial circulation with isolated posterior intracranial circulation involvement in one additional patient. One of these patients showed evidence of acute posterior circulation ischemia and presented with vertigo but no evidence of ischemic optic neuropathy or ophthalmic artery enhancement. 14 of the 55 patients had abnormal enhancement of the ophthalmic arteries including 1 with arteritic ischemic anterior optic neuropathy and vertebral arteritis and one patient with involvement of the internal carotid and posterior cerebral arteries but no reported vision changes.

Involvement of the intracranial vessels is uncommon, and did not correlate with ophthalmic arteritis. Both the anterior and posterior circulation was affected in most cases.

Afternoon Poster Presentations - Clinical Science

Pediatric cyclic vomiting syndrome – ten years of emergency department data

***Lauren Beals** (1), Sharon Sarjinsky (2), Matuesz Faltyn (3), April Kam (4)

(1) Michael G DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada
(3) Faculty of Arts and Sciences, McMaster University, Hamilton, Ontario, Canada
(4) Division of Pediatric Emergency Medicine, McMaster University, Hamilton, Ontario, Canada

Cyclic vomiting syndrome (CVS) is an idiopathic disorder characterized by recurrent episodes of vomiting in the absence of any organic cause.1 CVS exacerbations can be debilitating for patients, who struggle with episodes of unretractable symptoms and frequently present to the emergency department (ED) for management.2 To optimize treatment, tertiary centers have adopted standardized order sets based on the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) recommendations.3 However, no data exists to quantify how frequently these visits occur, and whether prescribed management improves patient outcomes.4 The study's primary objectives were to calculate CVS prevalence in a tertiary Pediatric ED over a ten-year period and determine whether implementation of a NASPGHAN-guided order set improved patient outcomes.

A retrospective review of patients aged 0 to 18 who presented to the McMaster Children's Hospital ED with idiopathic cyclic vomiting between April 2008 and April 2018. Eligible patients were identified by decision support services and evaluated for inclusion criteria by two independent reviewers. Subsequent data collection was performed with inter-rater reliability tested using Cohens Kappa Statistic. Data analysis including descriptive statistics to report the frequency of discrete variables and regression methods for continuous variables was performed.

225 discrete ED visits producing 95 hospital admissions were recorded. Over 50% of individual visits were attributed to less than 10% of CVS patients, suggesting a significant burden of disease despite low patient prevalence. Recurrent patterns of symptom presentation were also noted. One-way analysis of variance (ANOVA) for improvement of patient outcomes before and after order set implementation is pending complete analysis March 2019.

CVS carries a high rate of representation to the ED despite recurring identifying features. Shifting focus of standardized management from strategies for abortive therapy to strategies that may prevent future exacerbations is warranted.

Afternoon Poster Presentations - Clinical Science

International BRCA1/2 variant data-sharing practices

Juli M. Bollinger(1), Abhi Sanka(2), ***Lena Dolman**(3), Rachel G. Liao(4), Robert Cook-Deegan(2)

(1) Center for Medical Ethics and Health Policy, Baylor College of Medicine, Houston, Texas, USA & Berman Institute of Bioethics, Johns Hopkins University, Baltimore, Maryland, USA
(2) School for the Future of Innovation in Society, Arizona State University, Tempe, Arizona, USA
(3) Global Alliance for Genomics and Health, Ontario Institute for Cancer Research, Toronto, Ontario, Canada
(4) Broad Institute of MIT and Harvard, Cambridge, Massachusetts, USA

Pathogenic variants in the BRCA1 and BRCA2 genes significantly increase lifetime risk of breast and ovarian cancer. After more than two decades of BRCA1/2 testing, new variants continue to be discovered and ~5% are variants of uncertain clinical significance (VUS) in individuals of Northern European ancestry, with higher VUS rates in other populations. The ability to interpret novel BRCA1/2 variants for the purposes of clinical decision making and management of risk (e.g. through prophylactic surgery or increased surveillance) relies upon data sharing among world-wide clinicians and researchers.

In the current study, our team conducted 28 interviews with personnel from clinical laboratories and databases (having between 1- and 22-years' experience with BRCA1/2 testing) located in 16 countries across North America, South America, Europe, Africa, the Middle East, and Asia, in order to better understand current data sharing practices and barriers world-wide.

Our results include qualitative analyses of the interview responses, including evaluation of strategies used for interpreting novel variants, and current barriers to and incentives for sharing BRCA1/2 data. The interviews reveal substantial international support for data sharing, with assertions that sharing meets patient expectations and is consistent with "clinical duty". There is strong aversion to data-hoarding practices, particularly in the U.S.A. where Myriad Genetics previously held a patent-based service monopoly on BRCA1/2 testing and accumulated the world's largest proprietary BRCA1/2 database. Barriers that prevent data sharing include technical challenges relating to data standardization and interoperability, liability concerns, legal barriers to national data export, challenges in obtaining patient consent to sharing in some settings, and lack of dedicated staff and resources for this effort.

Our findings advocate for technical standards, legal & regulatory support, and financial reimbursement to enable increased international BRCA1/2 data sharing in order to improve clinical decision-making in hereditary cancer.

Afternoon Poster Presentations - Clinical Science

Relationship between dietary patterns and asthma in children: a systematic review and meta-analysis

***Manreet Dhaliwal** (1), Jeremy Li (1), Michael K. Parvizian (1), Imran Satia (2), Om P Kurmi (3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Division of Respirology at McMaster Children Hospital, Department of Medicine, McMaster University, Hamilton, Ontario, Canada
(3) Division of Respirology at Population Health Research Institute, Department of Medicine, McMaster University, Hamilton, Canada

The intake of various specific nutrients has been reported to be modifiable risk factors in the development of asthma. However individual nutrients are rarely consumed in isolation, so there has been a shift towards studies investigating the effects of a dietary patterns as a whole. The results from studies investigating the effects of dietary patterns on asthma have been inconsistent. We aimed to carry out a systematic review to evaluate the effects of healthy versus unhealthy dietary patterns on the risk of asthma in children.

Studies were obtained by searching Medline, EMBASE, Web of Science, CINAHL, AMED and the Cochrane Database according to a predefined protocol that has been published in PROSPERO (Protocol CRD42018094503). All identified articles were screened, assessed for quality and extracted in duplicate. Articles exploring different dietary patterns including healthy (Mediterranean, prudent or the Alternative Healthy Eating Index 2010 diet) or unhealthy (western, processed and traditional with high sugar contents) dietary patterns were extracted. The systematic review and meta-analysis as a whole included both asthma and COPD as outcomes of interest but here we focus solely on asthma. A random effects model was used to carry out the meta-analysis.

Twenty-nine studies including ten cross-sectional studies, twelve prospective cohort studies, four case-control studies and three randomized control trials met our inclusion criteria for dietary patterns and asthma outcomes. Eight of these studies with subject populations comprised of only children were meta-analysed. Meta-analysis showed that adherence to healthy diets were protective with a 5% lower risk of asthma in children (pooled effect size 0.95, 95% CI 0.92-0.97) and adherence to unhealthy diets had a 7% higher risk of asthma in children (1.07, 1.00-1.19).

Adherence to a healthy diet is protective against asthma whereas as adherence to an unhealthy diet significantly increased the risk of asthma in children.

Afternoon Poster Presentations - Clinical Science

Pediatric Pre-Tonsillectomy Education Programs: A Systematic Review

***Marc Levin**, BSc.(1), Nicole L. Seligman, BA.(3), Heather Hardy, MSc, CLSt. Dipl., CCLS(2,3), Sepideh Mohajeri BSc., MD(2), Jonathan A. Maclean, MD, FRCSC(2)

(1) Michael G. DeGroote School of Medicine, McMaster University
(2) Division of Otolaryngology - Head and Neck Surgery, McMaster University
(3) Masters of Science in Child Life and Pediatric Psychosocial Care Program, McMaster University

Over 14,000 tonsillectomies are performed in Ontario annually. Challenges with home postoperative care frequently lead to Emergency Department (ED) visits. A 2013 Ontario Pediatric Health Council recommended the integration of patient education into tonsillectomy care. Understanding the existing educational services is fundamental to optimally implementing such programs into clinical settings.

Systematic review of the Ovid Medline, Cochrane, CINAHL and EMBASE Classic databases were conducted using PRISMA guidelines.

Our search identified 335 articles. Final inclusion consisted of 10 studies. These studies included eight pre-operative booklets, one smartphone app, three text-message programs, one video program, one internet resource, and three caregiver programs. Most resources improved post-tonsillectomy ED visits, patient anxiety and pain management, while others had no effect on these factors.

There is mixed data regarding the efficacy of pre-tonsillectomy education programs on perioperative outcomes. Further research is required to better understand the utility of such programs and their implementation into healthcare settings.

Afternoon Poster Presentations - Clinical Science

Patients on maintenance dialysis with a Family History of Kidney Disease have more Transplant Knowledge

***Maroof Khalid**, BMSc, Oladapo Ekundayo, MD, Navneet Singh, HBSc, Vardaan Gupta, HBSc, Yu-Ying Liao, Maryam Omran, Istvan Mucsi, MD, PhD, FRCPC, FASN

Multi-Organ Transplant Program, Department of Surgery, Toronto General Hospital, Toronto, Canada

Better transplant knowledge helps patients with End Stage Kidney Disease (ESKD) deal with challenges associated with their condition; it may also help patients to better navigate the process of accessing kidney transplantation. Social support and sharing of lifetime experiences contribute to knowledge acquisition about illness and self-management. However, little is known about the association between having family history of kidney disease and kidney transplant (KT) related knowledge.

A cross-sectional convenience sample of patients with ESKD on maintenance dialysis from several dialysis units in Toronto. Baseline socio-demographic and clinical data were collected using a tablet-based electronic data capture system and medical records. This was used to assess family history of kidney disease (exposure). A standard questionnaire was used to determine transplant knowledge (outcome). Univariable associations were tested using Chi-square test. Multivariable adjusted linear/logistic regression models were used to assess the association between the exposure and outcome variables.

Among the 400 participants with ESKD (mean age 58 (13), 62% male), 125 participants had family history of kidney disease. The mean (SD) knowledge score for those with family history was 7.1 (3.0), compared to patients with no family history: 6.2 (3.0) ($p=0.01$). After adjusting for socio - demographic and clinical factors such as age, gender, ethnicity, income, educational levels, and Charlson Co-Comorbidity Index, patients with a family history were significantly more likely to have "high" KT knowledge (OR 1.60, CI=1.01 – 2.52, $p=0.045$). In a linear regression model using the knowledge scores as the dependent variable, this association remained significant after adjusting for the same factors (β-coeff 0.59, CI=0 – 1.18, $p=0.49$).

Participants of this study with compared to without family history of kidney disease demonstrated significantly more kidney transplant related knowledge. Potentially incorporating support networks into patient education process may improve knowledge acquisition and eventually access to transplantation.

Afternoon Poster Presentations - Clinical Science

Bariatric surgery in patients with a history of nephrolithiasis: 24-hour urine profiles and radiographic changes after roux-en-y gastric bypass versus sleeve gastrectomy

***Michael Uy** (1), Richard Di Lena (2), Jen Hoogenes (2), Bobby Shayegan (2), Edward Matsumoto (2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada.
(2) Division of Urology, Department of Surgery, McMaster University, Hamilton, Ontario, Canada.

Roux-en-Y gastric bypass (RNYGB) and sleeve gastrectomy (SG) are the most common bariatric surgeries, yet it is not clear which is superior. Considering the propensity for the development of lithogenic urinary profiles and nephrolithiasis post-bariatric surgery is important. To our knowledge, no studies have evaluated these changes in post-bariatric surgery patients with a history of nephrolithiasis. We evaluated the differences in 24-hour urine (24HU) values and radiographic imaging post-RNYGB and SG in patients with a history of nephrolithiasis.

We reviewed the records of 92 patients with a history of nephrolithiasis and underwent either RNYGB or GS at our centre. CT KUB imaging and 24HU profiles were performed pre-operatively and at 1-year follow-up. The Wilcoxon rank sum test compared pre- and post-operative values, while multivariate regression analysis determined predictors of stones.

55 patients underwent RNYGB and 37 had SG. No baseline differences were found between groups. For 24HU profiles, both groups had similar findings, although the RNYGB group had a significant increase in oxalate and a decrease in citrate, while the SG group had a significant decrease in oxalate and stable citrate. A history of stone procedures (OR 4.4, 95% CI 1.2-16.5, $p = 0.03$) and RNYGB (OR 4.2, 95% CI 1.2-14.9, $p = 0.03$) were predictors of post-operative hyperoxaluria. Radiographically, 20.4% of the RNYGB group and 24.3% of the SG developed new stones. Post-operative stone procedure rate for each group was 9.3% and 8.1% respectively.

Patients with a history of nephrolithiasis who underwent RNYGB had exacerbated lithogenic 24HU profiles, while those in SG patients improved. There were no differences in stone event rate, although this may be due to limited follow-up. The post-operative stone formation rate is higher than previously reported in similar studies. These findings support close urinary monitoring in patients with a history of nephrolithiasis who undergo RNYGB.

Afternoon Poster Presentations - Clinical Science

Post-market modifications of high-risk plastic surgery devices

***Oluwatobi R. Olaiya** (1), Ameena Oyesile(2), Mark H McRae(3)

(1) Michael DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada;
(2) Department of Health Science, Western University, London, Ontario, Canada
(3) Division of Plastic Surgery, Department of Surgery, McMaster University, Hamilton, Ontario, Canada

In the United States, high-risk medical devices must be cleared through the premarket approval (PMA) pathway which requires clinical evidence ascertaining safety and efficacy. Approved devices can be altered and introduced to market without additional study through a PMA supplemental review track. Amid recent controversy regarding the safety plastic surgery devices, this study aims to characterize how medical devices come to market and the changes they undergo once initially cleared.

A retrospective, cross-sectional analysis of the FDA PMA data containing all records of all original and supplemental pre-market approvals.

From January 1982 to December 2018, there have been 39 original plastic surgery devices approved by the FDA. The devices included 6 wound dressings, 2 vascular sealants, 9 skin adhesives, 1 suture, 5 laser devices, 17 dermal implants, and 8 breast implants. The amount of original high-risk devices demonstrated no observable trend from January 1980 to December 2018 ($R2=0.09$; $p > 0.05$). PMA supplement usage during the same period exponentially increased ($R2=0.93$; $p < 0.05$). Each plastic surgery device on the market has undergone a median of 11 changes (IQR, 3-35). Most supplements were approved through the 30-day track (27%, 103 devices), intended for manufacturing process changes but requires no specific new data. There were 97 supplements (26%) that were approved through the 180-day track, which is intended for major device changes. Radiesse subdermal implant and Mentor MemoryShape Breast Implant tied for the most device changes with 8 supplements per active year with a total of 102 device changes since 2016.

High-risk plastic surgery devices undergo numerous minor changes without clinical evidence to support the safety and efficacy of modified versions. Plastic surgeons ought to be aware that device registries are important measures of safety as many devices enter the consumer market without clinical data to support safety.

Afternoon Poster Presentations - Clinical Science

Can Epstein-Barr virus be sexually transmitted? A case report

***Shouzhe (Sally) Lin** (1), Candace Rutherford (2), Marek Smieja (2-4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada
(2) Department of Laboratory Medicine, Hamilton Health Sciences, Hamilton, ON, Canada
(3) Department of Laboratory Medicine, St. Joseph's Healthcare Hamilton, Hamilton, ON, Canada
(4) Department of Pathology & Molecular Medicine, McMaster University, Hamilton, ON, Canada

Epstein-Barr virus (EBV) is primarily transmitted through oral secretions and can infect epithelial cells and B-lymphocytes. Infections typically manifest as infectious mononucleosis: cervical lymphadenopathy, sore throat, fever, fatigue, myalgia, and atypical lymphocytosis. Here, we present a rare case of a woman with primary EBV infection presenting with pelvic lymphadenopathy and rectal pain.

CASE PRESENTATION: A previously-healthy 19-year-old woman presented with a two-week history of fever, fatigue, pain on urination, rectal pain, and tender inguinal lymphadenopathy. She had previously travelled to El Salvador where she had one sexual partner, but no sick contacts. Physical examination was otherwise unremarkable apart from bilateral tender inguinal lymph nodes. Her blood work revealed lymphocytosis and elevated liver transaminases. She had a positive EBV monospot test, and her initial serology was negative for EBNA-IgG, EA-IgG, and VCA-IgG antibodies. She later seroconverted; one week later, her EA-IgG was reactive, and four months later, her VCA-IgG was positive. Through qPCR quantification of EBV-DNA, her throat swab yielded 3.5 log copies/mL and the vaginal swab yielded 5.1 log copies/mL. Investigations for common STIs, including Chlamydia trachomatis, Neisseria gonorrhea, lymphogranuloma venereum, HIV, syphilis, CMV, Hepatitis A, B, and C were all negative.

DISCUSSION: Her positive monospot, seroconversion, and high EBV viral load in her vaginal swab were all suggestive of a primary pelvic EBV infection, which raises the question if EBV can be sexually transmitted. Studies have shown that EBV can be found in the genital epithelium and secretions of both sexes, and the rate of seroconversion is higher in those who engage in penetrative sexual intercourse than those who engage in non-penetrative sexual activities including deep kissing.

Primary EBV infection should be considered in sexually-active patients who present with pelvic lymphadenopathy. Further investigations into the sexual transmission of EBV is required.

Afternoon Poster Presentations - Clinical Science

Urgent versus Standard Colonoscopy for Management of Acute Lower Gastrointestinal Bleeding: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

***Sama Anvari** (1, 2, 3), Yung Lee (1, 2, 3), Aristithes G. Doumouras (2, 3), Khurram J. Khan (4), Dennis Hong (2, 3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada.
(2) Division of General Surgery, Department of Surgery, McMaster University, Hamilton, Ontario, Canada.
(3) Centre for Minimal Access Surgery (CMAS), St. Joseph's Healthcare, McMaster University, Hamilton, Ontario, Canada.
(4) Division of Gastroenterology, Department of Medicine, McMaster university, Hamilton, Ontario, Canada

Acute lower gastrointestinal bleeding (LGIB) is a common indication for hospitalization. Colonoscopy has an established role in the management of acute LGIB, but the optimum timing of the procedure following patient presentation remains unclear. Current guidelines recommend colonoscopy within 24 hours, but this is based on limited evidence. We performed a systematic review and meta-analysis of randomized controlled trials (RCTs) to evaluate the effect of urgent versus standard colonoscopy timing on acute LGIB management.

Medline, EMBASE, CENTRAL, Web of Science and PubMed were searched up to November 2018. RCTs were eligible for inclusion if they randomized patients with hematochezia to urgent (<24 hours) versus standard (>24 hours) colonoscopy. Pooled estimates were calculated using random effects meta-analyses and heterogeneity was quantified using the inconsistency statistic. GRADE was used to assess certainty of evidence.

From 485 potentially relevant studies, 3 RCTs involving a total of 304 patients met the inclusion criteria. Urgent colonoscopy did not show any significant difference to standard colonoscopy in length of hospital stay, units of blood transfused, rate of additional intervention required, and mortality. Additionally, colonoscopy outcomes such as rates of further re-bleeding after colonoscopy, colonoscopy related complications, non-diagnostic colonoscopy, and presumptive diagnosis of bleeding source did not differ between two groups. The overall GRADE certainty of evidence was low in majority of the outcomes.

The timing of colonoscopy may not play a significant role in management of patients with acute LGIB. Further large-scale RCTs are required to investigate whether urgent colonoscopy is beneficial in certain populations.

Afternoon Poster Presentations - Clinical Science

Acute management of pediatric cyclic volume syndrome: a systematic review

***Shannon Gui**(1), Nimita Patel(2), Robert M. Issenman(3), April J. Kam(4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Faculty of Science, McMaster University, Hamilton, Ontario, Canada
(3) Department of Pediatrics, Division of Pediatric Gastroenterology, McMaster Children's Hospital, Hamilton, Ontario, Canada
(4) Department of Pediatrics, Division of Emergency Medicine, McMaster Children's Hospital, Hamilton, Ontario, Canada

Pediatric cyclic vomiting syndrome is characterized by acute attacks of vomiting. Current disease management in the acute care setting, which aims to abort a vomiting attack, is largely empirical rather than evidence-based. There is no existing standardized, evidence-based treatment protocol in pediatric emergency departments. This systematic review aims to synthesize current data on acute pharmacological interventions and their effectiveness for disease management.

799 studies published up from December 1954 to February 2018 were extracted from MEDLINE via Pubmed, Embase via OVID, CINAHL via EBSCO and Cochrane Controlled Trials Registry using keywords. Studies were evaluated for inclusion and exclusion by two independent reviewers using predetermined inclusion/exclusion criteria.

The search yielded 84 studies for full review, of which 54 were included in the systematic review. Studies were subsequently separated into one group of 6 case series studies containing quantitative data on sumatriptan, ondansetron, phenothiazines, prokinetic agents, carbohydrate, isometheptene and aprepitant; and one group consisting only of qualitative studies containing expert recommendations.

Ondansetron has the most quantitative and qualitative evidence to support its inclusion in pediatric emergency department protocols. Sumatriptan and aprepitant are potential candidates for inclusion. Nevertheless, there is limited quantitative evidence on pediatric cyclic vomiting syndrome management in the acute care setting. Qualitative data from retrospective studies and case reports are not applicable to a larger patient population. This informs a need for controlled, prospective cohort studies and randomized controlled trials in order to optimize current management protocols and to develop new medical interventions.

Afternoon Poster Presentations - Clinical Science

The prevalence of obstetric risk factors in pregnancies with vasa previa: a systematic review and meta-analysis

***Sureka Pavalagantharajah**(1,3), Linda A. Villani(1,4), Rohan D'Souza(1,2)

(1) Department of Obstetrics and Gynaecology, Mount Sinai Hospital, Toronto, Ontario
(2) Giesel School of Medicine, Dartmouth College, Hanover, New Hampshire
(3) Michael G. Degroote School of Medicine, McMaster University, Hamilton, Ontario
(4) University of Utah School of Medicine, Salt Lake City, Utah

To review existing literature and calculate the prevalence of vasa previa and its known risk factors in affected pregnancies.

We conducted a systematic review of observational studies in accordance with the Meta-analysis of Observational Studies in Epidemiology (MOOSE) guidelines. Five databases, Medline, Embase, the Cochrane Library, PubMed and www.clinicaltrials.gov were searched and only studies describing more than five cases of vasa previa were included. Two reviewers independently carried out title and abstract screening and data extraction from included full-texts. Disagreements were resolved through discussion. The references of included papers were screened to identify articles missed by the initial literature search. We performed DerSimonian-Laird binary random-effects meta-analyses using OpenMetaAnalyst, presenting pooled proportions with 95% confidence intervals (CI), of the prevalence of risk factors in cases of vasa previa.

We included 21 studies that reported 428 pregnancies with vasa previa out of 1,027,918 deliveries (0.46 cases of vasa previa per 1000 deliveries). The prevalence of known risk factors for vasa previa included a low-lying placenta [61.5% (53.0-70.0%)], velamentous cord insertion [52.2% (39.6-64.7%)], bilobed or succenturiate lobed placenta [33.3% (20.9-45.7%)], the use of any assisted reproductive technique [28.2% (20.1-36.3%)] (including in-vitro fertilization [26.4% (16.0-36.8%]), and multiple gestation [8.92% (5.33-12.5%)]. These studies fared well on risk of bias assessment.

Although prenatal diagnosis of vasa previa has been shown to improve obstetrical and neonatal outcomes with a prevalence of 0.46 per 1000 pregnancies, population-based screening may not be cost-effective. However, a policy of screening pregnancies at increased risk for vasa previa may be a reasonable option, the clinical and cost-effectiveness of which needs to be determined.

Afternoon Poster Presentations - Clinical Science

Transorbital endoscopic resection of a metastatic orbital paraganglioma: a new approach to a rare disease

***Teffran J. Chan** (1), Trevor Lewis (2), Kesava KV Reddy(2), Doron D. Sommer (2)

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

Paragangliomas are a rare family of neoplasia comprised of extra-adrenal collections of neuronal crest derived tissue which typically present in the abdomen or head and neck.(1) Orbital paragangliomas are extremely rare with under 60 cases being reported in literature since Fisher and Hazard described their encounter in 1952, of which, only 4 were metastatic.(2–4) Paragangliomas rarely metastasize to the orbits and can cause permanent vision loss due to mass effect unless resected. Surgical reports in literature only describe non-endoscopic and external approaches.

Here we report the first case of a transorbital endoscopic approach to a metastatic paraganglioma in the laterosuperior orbit.

Transcribed clinical notes, consultation, and operative reports of the patient were retrieved through the Hamilton health sciences Meditech and Clinical Connect database. Ovid Medline was used to search for all English articles on paragangliomas with orbital involvement. Retrieved papers were searched for references and a database of all reported cases was created.

31 cases were reported, all surgically managed non-endoscopically via external incisions. Complications included gaze limitation, retrobulbar hematoma, vision loss, and diplopia. Recurrence rates were 25.8 %. A transorbital endoscopic approach offers potentially lower functional impairment, better cosmesis and improved visualization. Post operatively, our patient reported improved visual acuity and extraocular movements.

Adequate debulking of the metastatic lesion was achieved in our patient without significant morbidity whilst decreasing symptoms secondary to mass effect to the orbit. Management through endoscopy avoids large surgical scars, sparing of the orbit, and reduced risk of cerebrospinal fluid leaks. The transorbital endoscopic approach to orbital paragangliomas is a potentially safe and effective alternative for intraorbital access and management of neoplastic lesions.

Afternoon Poster Presentations - Clinical Science

Extended thromboprophylaxis following colorectal surgery in patients with inflammatory bowel disease: A clinical review

***Tyler McKechnie** BSc. (1), Julian Wang (1), Jeremy Springer MD MSc. (2), Peter Gross MD MSc. FRCP (1,3), Shawn Forbes MD FACS (1,2), Cagla Eskicioglu MD MSc. FACS (1,2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada
(2) Department of Surgery, McMaster University, Hamilton, ON, Canada
(3) Department of Medicine, Hematology and Thromboembolism, McMaster University, Hamilton, ON, Canada

Patients with inflammatory bowel disease (IBD) are at increased risk of postoperative venous thromboembolism (VTE) following colorectal surgery. The pathogenesis is not fully understood, but is multifactorial. Despite being at an increased risk for VTE following colorectal surgery, IBD patients are not regularly prescribed extended pharmacological thromboprophylaxis.

Search of Ovid Medline, EMBASE, and PubMed databases was performed. A qualitative analysis was performed using 10 clinical questions developed by colorectal surgeons and a thrombosis hematologist. The Newcastle-Ottawa Scale was utilized to assess the quality of evidence.

A total of 1229 studies evaluating VTE in IBD patients undergoing colorectal surgery were identified, 39 of which were included. The risk of bias assessment demonstrated low risk of bias in patient selection and comparability, with variable risk of bias in reported outcomes. Postoperative VTE rates ranged between 0.6% and 8.9%. Patient specific risk factors for postoperative VTE included: ulcerative colitis, increased age (>65), and obesity. Surgery specific risk factors for postoperative VTE included: open surgery, emergent surgeries, and ileostomy formation.

Extended thromboprophylaxis should be considered following colorectal operations in patients with one or more high risk surgical or patient factor(s). Due to the improved medical management of IBD and the relatively low rate of postoperative VTE, randomized controlled trials are challenging to perform. Therefore, observational studies alone can be used in support of the development of guidelines for prescribing practice of VTE extended prophylaxis in patients with IBD undergoing bowel resection. A combination of pathophysiology, patient risk factors, and surgical risk factors put IBD patients undergoing bowel resection at increased risk of postoperative VTE. Consideration of extended thromboprophylaxis is therefore recommended. If possible, larger, multicenter randomized studies are warranted to further inform best practices.

Afternoon Poster Presentations - Clinical Science

Gestational diabetes, obesity and hypertension among Ontario midwifery clients: a mixed methods study

***Giuliana Guarna** (1,2), Beth Murray-Davis (1) , Howard Berger (3), Nir Melamed (4), Maisah Syed (1) , Karizma Mawjee (3), Jon Barrett (4), Joel G. Ray (6), Michael Geary (7), Sarah D. McDonald (5)for DOH-NET (Diabetes, Obesity and Hypertension in Pregnancy Research Network) and SOON (Southern Ontario Obstetrical Network) Investigators TM

(1) Department of Obstetrics and Gynecology, Midwifery Education Program, McMaster University, Hamilton, Ontario, Canada
(2) Michael G DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada.
(3) Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, St. Michael's Hospital, University of Toronto, Ontario, Canada
(4) Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, Sunnybrook Health Sciences Centre, University of Toronto, Ontario, Canada
(5) Departments of Obstetrics and Gynecology, Radiology and Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, Canada
(6) Departments of Medicine and Obstetrics and Gynaecology, St. Michael's Hospital, University of Toronto, Ontario, Canada
(7) Department of Obstetrics & Gynaecology, Rotunda Hospital, Dublin, Ireland

The increasing prevalence of gestational diabetes mellitus, obesity, and gestational hypertension, the DOH triad, is one of the greatest challenges to global health today. DOH is associated with adverse perinatal outcomes including macrosomia and neonatal mortality, and predisposes children to future obesity, diabetes, and cardiovascular disease. Midwives generally care for low-risk pregnancies but are increasingly caring for clients with DOH in pregnancy. According to the College of Midwives of Ontario guidelines, when certain complications such as DOH arise, midwives must consult or transfer care of clients to a specialist. However, obesity is not mentioned in these guidelines, and midwives are often obliged by varying hospital protocols or obstetrician preferences to consult or transfer care for reasons outside of the guidelines. This study explored midwives' experiences managing pregnancies affected by DOH in Ontario.

Data was collected through a self-administered questionnaire via SurveyMonkey. The survey was completed by 173 midwives providing antenatal care in Ontario. Basic descriptive statistical analysis was completed with Excel.

Midwives felt prepared to manage pregnancies complicated by gestational hypertension and gestational diabetes mellitus. On the other hand, they felt ill-equipped to care for pregnancies affected by obesity due to unclear guidelines and social stigma. Barriers to care for pregnancies affected by DOH included inconsistent preferences among obstetricians for management of DOH, lack of clarity on each provider's role when collaborating, difficulties arranging consultations and accessing specialized clinics. Most midwives also felt they required additional training to manage these conditions. Generally, midwives relied upon guidelines and hospital protocols when deciding to consult or transfer care for GDM and GH and on hospital protocols for obesity. Midwives experienced several barriers when collaborating for pregnancies affected by DOH. There is a need to address these barriers, clarify existing guidelines, and provide additional training opportunities.

Afternoon Poster Presentations - Clinical Science

The impact of vocational interventions on vocational outcomes, quality of life, and community integration in adults with childhood onset disabilities: a systematic review

***Zechen Ma** (1), Priya Dhir (2), Laure Perrier PhD (3), Mark Bayley MD (1), and Sarah Munce PhD (1)

(1) Toronto Rehabilitation Institute, University Health Network, Toronto, Canada
(2) Faculty of Medicine, University of Toronto, Toronto, Canada
(3) University of Toronto Libraries, University of Toronto, Toronto, Canada

Despite the desire and ability to work, individuals with childhood onset disabilities are under-represented in employment. Vocational interventions alleviate some barriers to obtaining and maintaining employment for this population. The research question addressed is: What is the impact of vocational interventions on vocational outcomes, quality of life (QoL), and community integration (CI) in adults with childhood onset neurological disabilities including cerebral palsy (CP), spina bifida (SB), and acquired brain injury (ABI)?

A literature search was conducted in multiple electronic databases. All experimental and observational studies with comparator group(s) were included. Two reviewers independently completed titles and abstracts screening, full text screening, data abstraction, and risk of bias assessment.

Seventeen studies were eligible for final inclusion including 3 randomized-controlled trials, 4 non-randomized studies, and 10 observational studies. Sixteen of seventeen studies included only individuals with ABI, while one included individuals with CP and SB. Vocational interventions from experimental studies were mainly components of multifaceted interventions. Most observational studies were from the United States Vocational Rehabilitation Service.

Vocational interventions may be effective in improving vocational outcomes, QoL, and CI for individuals with ABI. There is limited experimental evidence on interventions that specifically target employment. Observational data suggest that receiving job placement assistance, on-the-job training and supports, counselling/guidance, maintenance, and supported employment successfully predicted employment outcomes.

Afternoon Poster Presentations - Quality Improvement

Evaluation of strategies to accomplish universal BRCA 1/2 testing for women with high grade serous ovarian cancer at the Juravinski Cancer Centre

***Stefano Lopiccolo** (1), Bethina Loiseau (2), Lorrie Lynch (3), Kevin Zbuk (3), Kathleen Bell (3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, Ontario, Canada
(3) Department of Oncology, Juravinski Cancer Centre, Hamilton, Ontario, Canada

Knowledge of BRCA1/2 mutation status is important for all women with a diagnosis of high grade serous ovarian cancer (HGSOC). BRCA1/2 mutation carriers may benefit from targeted therapies and their blood relatives may benefit from predictive genetic testing and risk reducing measures. We aim to determine a common touchpoint within the care pathway for women referred to the Juravinski Cancer Center (JCC) with: (i) a diagnosis of ovarian cancer, fallopian tube cancer, or primary peritoneal cancer (ii) a suspicious pelvic mass or (iii) clinical symptoms suggestive of ovarian cancer. A common touchpoint can be used to implement universal germline BRCA1/2 mutation testing to capture the remaining patients with suspected HGSOC who did not undergo genetic testing.

A retrospective chart review was conducted on 284 new patient referrals to the JCC from January 2016-December 2017. Qualitative analysis of patient charts was used to extract diagnosis and treatment data used to construct likely patient care pathways. The area of greatest convergence within this pathway was used to identify a common touchpoint.

Outpatient blood work was obtained for 94.7% (269/284) of patients by their first appointment at the JCC and identified as the common touchpoint in the care pathway. Beyond this first appointment, there was significant divergence in care pathways.

Blood samples for germline BRCA1/2 testing could be obtained at the first appointment as blood work is a standard component of the order set for all women with HGSOC. This would ensure that the majority of women diagnosed with known or suspected HGSOC provide a DNA sample which can be used for BRCA1/2 testing upon patient/family consent and/or confirmation of the diagnosis. Determination of mutation status will allow appropriate genetic counselling and risk-reducing intervention planning for BRCA1/2 mutation carriers and their related family members.

Afternoon Poster Presentations - Quality Improvement

Increased postoperative cardiac events in Hamilton: early detection or over estimation? Findings from our institution and review of recommended clinical practice guidelines

Alexandra Allard-Coutu(1), Kevin Singh(2), ***Chloe R. Wong**(3), Shawn Forbes(1), Ameen Patel(2)

(1) Department of General Surgery, McMaster University, Hamilton, Ontario, Canada
(2) Department of Internal Medicine, McMaster University, Hamilton, Ontario, Canada
(3) Department of Medicine, McMaster University, Hamilton, Ontario, Canada

Cardiovascular events cause significant mortality after noncardiac surgery.1 National Surgical Quality Improvement Program (NSQIP) data reveals higher rates of postoperative cardiac events in Hamilton (OR 11.5, CI 9.38-14.11) compared to participating Canadian hospitals, with greater overall morbidity (OR 2.18, CI 1.9-2.5).2 Asymptomatic myocardial injury without ischemic symptoms (MINS) increases 30-day mortality (OR 3.87, CI 2.96-5.08)1 and since postoperative troponins are routinely monitored in Hamilton, early detection may account for these findings.

Retrospective cohort study among patients with postoperative cardiac events after noncardiac surgery at NSQIP affiliated Hamilton hospitals between June 2015-2017 where 296 charts were reviewed. Patient demographics, intraoperative variables, comorbidities and 30-day outcomes were compared.

Postoperative troponins were measured in 96.6% of patients (n=286, and 80.7% were diagnosed with MINS (n=239) without criteria for myocardial infarction (MI), 15.2% with non-ST elevation MI (NSTEMI, n=45), 3.7% with nonischemic troponin elevation (n=11), and 0.33% with cardiac death (n=1). MINS was associated with an 8.4% 30-day mortality rate, comparable to the NSTEMI cohort (15.6%, p=0.16).

While the NSTEMI group was associated with increased morbidity (p=0.0001), there were no significant differences in 24 measured 30-day outcomes, including infection and re-operation. There were no significant differences in anesthetic/operative times or emergency cases, or in 44 measured demographic factors between groups, including ASA classification, cardiac risk factors and smoking history. We did not identify independent predictors of MINS versus other cardiac outcomes.

We identified a high incidence of asymptomatic MINS after noncardiac surgery without diagnostic criteria for MI. Postoperative MINS is prognostically relevant, associated with significant morbidity and mortality. This important complication remains frequently unrecognized, and perioperative troponin screening is essential in high risk patients. In addition, further research is required to assess whether disparities in determinants of health contribute to the rate of postoperative cardiac events in this population.

Afternoon Poster Presentations - Quality Improvement

Testing the effectiveness of a virtual reality versus traditional bell ringer examination format

***David Shin**, Jaskaran Gill, Josh Mitchell, Anthony Saraco, Danielle Brewer-Deluce, Alexander Ball, and Bruce Wainman

Education Program in Anatomy, McMaster University, Hamilton, Ontario, Canada

The objective structured practical examination (OSPE) or "bell ringer" exam is an effective testing modality for evaluating undergraduate anatomical knowledge. However, this examination style, especially when dealing with large class sizes, requires extensive preparation, supervision and a reliance on availability of prosected cadaveric specimens. One way to address these challenges is to implement virtual reality (VR) technology and create a VR bell ringer (VRBR). In the Education Program in Anatomy, we were able to create the VRBR from the Bassett Atlas of Human Anatomy stereoscopic imagery. The aim of the study is to test whether 2D or 3D visualization using the VRBR application provide superior testing environments. We hypothesize that students who have learned with real anatomical prosections will perform equally on 3D VR and physical specimens and worse in 2D VR because of the similarity of learning and testing materials.

The VR app was developed in Unity and implemented onto a custom Google Cardboard virtual reality headset by our lab. OSPE questions were created based on previous questions from undergraduate anatomy and physiology exams at McMaster University. Questions of appropriate difficulty were chosen based on point-biserial data.

We will recruit current undergraduate students who have completed an introductory human anatomy and physiology course (HTHSCI 1D06/2F03/2L03) to participate in the study in order to determine if the VRBR bell ringer modality is as effective as a traditional format at testing students' knowledge of anatomy.

Afternoon Poster Presentations - Quality Improvement

Do active assist transfer devices improve transfer safety for patients and caregivers in hospital and community settings? A scoping review.

***Tang K**, Diaz J, Lui O, Proulx L, Galle E, Packham T.

School of Rehabilitation Sciences, McMaster University, Hamilton, Ontario, Canada

Safe patient handling practices reduce injury risk for healthcare workers (HCW) and patients, but may conflict with goals of rehabilitation and person-centred care by minimizing a) active participation in transfers and b) autonomy and dignity while using mechanical lifts. Active assist transfer devices (AATDs) have potential to address both safety and support needs for appropriate clients. Purpose. What is the scope and nature of the evidence to support the use of AATD for improving transfer safety for patients and caregivers in both hospital and community settings?

Scoping review of peer-reviewed and grey literature, using systematic search strategies and multiple reviewers for identifying papers and extracting data.

Twenty-nine peer-reviewed publications, and 12 other documents (policy, technical) were included in the review. Half focused on HCW safety in the hospital setting, with only seven addressing patient safety in the community. Generally, literature was of low quality, with no controlled trials to support the benefit of this equipment, and often represented a nursing care perspective. However, positive outcomes reported included safety, satisfaction, and equipment utilization

There is a need for rigorous research on use of AATDs in the community comparing rehabilitation outcomes across other forms of transfer equipment. Other important targets include injury risk for family caregivers, and potential to support early discharge. At present, utilization of AATDs within the rehabilitation field will continue to rely on best judgement of the care team. Implementation of AATDs should be considered a compelling target for practice-based research and quality improvements.

Afternoon Poster Presentations - Quality Improvement

Building resilience: the conceptual basis and research evidence for Resilience Training Programs

***Sarah Forbes** (1), Deniz Fikretolgu (2)

(1) Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada
(2) Toronto Research Centre, DRDC, Toronto, Ontario, Canada

The relationship between adverse experiences and later development has been explored by many researchers, leading to the conceptualization of resilience as a factor explaining the normal or optimal development of some individuals exposed to adversity. Today many different interventions exist aiming to improve the ability of individuals to respond to adversity.

In this narrative literature review, we evaluate the literature surrounding resilience and resilience training, discussing the quality of the evidence supporting resilience training, theoretical and practical differences between types of training, and the impact of resilience and psychological training on outcome measures across a variety of settings

The results of our review show that the quality of the literature is mixed, resilience training is not well differentiated from other forms of training, and that the impact of psychological training on later functioning depends heavily on the type of outcome measured and the setting of the training.

Further research must be conducted prior to the implementation of resilience training programs in order to assure their efficacy and effectiveness in proposed contexts, as these programs are large time and financial investments for both organizations and participants.

Afternoon Poster Presentations – Community Research

The intergenerational effects of HIV in rural Kenya

Alexander Thomas, Jennifer Guan, ***Alison Knapp**, Teffran Chan, Richa John

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

In 2016, 1.6 million people were living with HIV in Kenya. With an adult prevalence of 5.4%, Kenya has the fourth highest epidemic in the world. 1 Although significant improvement in the nations HIV rate has been made in recent years, certain areas of the country have fallen behind. This study examines if familial HIV status and thus familial practices, attitudes, and beliefs, contribute to the significant difference in HIV rates between the rural village of Matangwe and the rest of Kenya.

Data was collected during a one-week period from July 10-17, 2018, at Matangwe Community Hospital. Patients aged 15 or older attending the clinic were consented for an anonymous survey consisting of questions written in both English and Luo. Results from the survey were analyzed and differences between those with no family history of HIV, and those with a positive family history of HIV were tested for significance at $\alpha = 0.05$.

Fifty-five patients aged 15 or older that attended the clinic responded to the survey. Of the respondents who reported having no parents or grandparents with HIV, 62% had HIV themselves. Of the respondents who reported having either a parent or a grandparent with HIV, 78% had HIV themselves. Given the small sample size, differences based on family history were not statistically significant. Responses to qualitative questions in the survey suggest familial attitudes, behaviours and beliefs contribute to the significantly higher rates of HIV in the area.

This study reinforces the effects of socioeconomic factors, local cultural beliefs, and cultural practices in sustaining the high prevalence of HIV in rural Kenya. A greater understanding of the misconceptions of safe-sex practices and HIV transmission that exist within families may help clinic workers in their delivery of care.

Afternoon Poster Presentations - Community Research

Flexible bodies, vulnerable minds: Analyzing the context of mental health policy in theatre and performance employment

David M. Beisel

Department of Critical Disability Studies in the School of Health Policy, York University, Toronto, Ontario, Canada.

Critical scholars have explored connections between the disabled body as a site of performativity, and in parallel, the potential for disability to invoke a unique labour circumstance for professional creators. This research expands Mad Studies through an analysis of theatre employment policy, contextualizing the mental health circumstances facing actors with disabilities, and the circumstances that exacerbate and exclude Madness in theatre workplaces.

The methodology for this study employs Carol Bacchi's WPR health policy review framework that systematically analyzes the implicit, assumed, objective, effective and repeated principles of that policy (Bacchi, 2012). This analysis applied the theoretical principles of critical disability studies. The findings of this examination were cross examined against themes exposed by a systematic literature review. Thus, the literature was applied to the policy such that efficacies, omissions and opportunities for that policy can be identified and contextualized.

This study identifies a prevalence of 'medical' models of mental health in predominant collective agreements. The omission of adequate mental health policy in formalized negotiations informs comparable absence in alternate precarious performance employment. Artists with disabilities are disadvantaged financially, in access to adequate employment, compensation and artistic agency. Practices of art therapy, institutionalization and mental health stigma have contributed to the internal and external disenfranchisement of disabled artists. These factors are paradoxically both risk factors for the 'manufacturing' of disability, and the absence of disability in precarious performance employment.

Afternoon Poster Presentations - Community Research

Young Muslim women's perceptions of sexual health: a qualitative study

***Nadia Igdoura** (1), Dr. Alexandra Ginty(2), Dr. Salikah Iqbal(3)

(1) Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada
(2) Department of Family Medicine, McMaster University, Hamilton, Ontario, Canada
(3) Department of Obstetrics & Gynecology, University of Toronto, Toronto, Ontario, Canada

Despite making up 3.1% of women in Canada, Canadian Muslim women remain a largely understudied population (Statistics Canada, 2011). While few Canadian sexual health studies have examined the needs of young people from diverse communities, the Toronto Teen Survey engaged 1216 youth, of which 10% self-identified as Muslim. The Survey found that Muslim youth were less likely to engage in higher risk sexual activities and less likely to access sexual health services (Flicker et al., 2009). A study by Lofters, et al. concluded that women born in a Muslim-majority country were less likely to be up to date on cervical cancer screening (2017). This demonstrates the impact cultural and religious background may have on access to health care and health care outcomes. This study aims to understand the perceptions young Muslim women have of sexual and gynecologic health, as well as to understand the sources from which they obtain knowledge and barriers that may impact their ability to access care.

Fifteen Muslim women (age 18-25) will participate in a one-hour semi-structured interview. A demographic survey will be administered to assess age, relationship status, immigration status and education level.Through a qualitative description approach, emerging themes will be identified. Relevant and important themes will then be selected for axial coding.

Given the oft-increased power differential between physicians and patients from underrepresented demographics (such as women and those from minority ethnic or cultural backgrounds) as well as the gap in knowledge regarding the reproductive and sexual health needs of young Muslim women, it would be of value to further understand their perceptions of sexual health in order to improve the quality and accessibility of their care. Understanding the perceptions of young Muslim women towards reproductive and sexual health care also helps to inform outreach and health education programming which may be targeted towards them.

Afternoon Poster Presentations - Community Research

Revisiting Canadian Medical School Efforts to Increase Class Diversity:

***Satyam Choudhuri**, ***Hassaan Khalik**, Jason Profetto

Department of Medicine, McMaster University, Hamilton, Ontario

In recent years, Canadian Medical schools have made efforts to create a more diverse medical student body as evidenced by Indigenous, Rural, and Black student streams. Despite these efforts, there has been a lack of admission reform with respect to increasing representation of medical students from all SES backgrounds. Additionally, there has been no comprehensive research done on the current medical student body demographics with respect to SES, race, etc.

Our research methodology includes surveying all medical school applicants to our affiliated medical school irrespective of their admissions status. We plan on disseminating an electronic survey to all eligible medical school applicants, and analyzing the relationship between the aforementioned demographics and probability of medical school admission.

Downstream implications of our study include establishing the efficacy of current efforts by medical schools to diversity their class composition, as well as equipping medical schools with the data to continue striving for more equitable admissions practices.