# MMSRD

# MCMASTER MEDICAL STUDENT RESEARCH DAY

## MAY 18TH, 2022

# TABLE OF CONTENTS

| | |
|---|---|
| **09:00 – 9:30AM** | **Check-in, Poster Setup** |
| **09:30 – 10:00AM** | Welcome Remarks |
| **10:00 – 11:30AM** | **7 Min Oral Presentations** |
| **11:30 – 12:00PM** | Lunch |
| **12:00 – 01:00PM** | **Keynote -  Dr. Sheila Singh** |
| **01:00 – 02:30PM** | Poster Presentations |
| **01:00 - 01:45PM** | **PREP Panel 1 Reflecting on My Journey to Medicine** |
| **02:15 – 03:00PM** | PREP Panel 2 Navigating Research: Where do I Start? |
| **02:30 - 03:30PM** | **3 Min Oral Presentations** |
| **03:30 – 04:00PM** | Closing Remarks and Awards Presentation |

# SCHEDULE

**MAIN ENTRANCE**
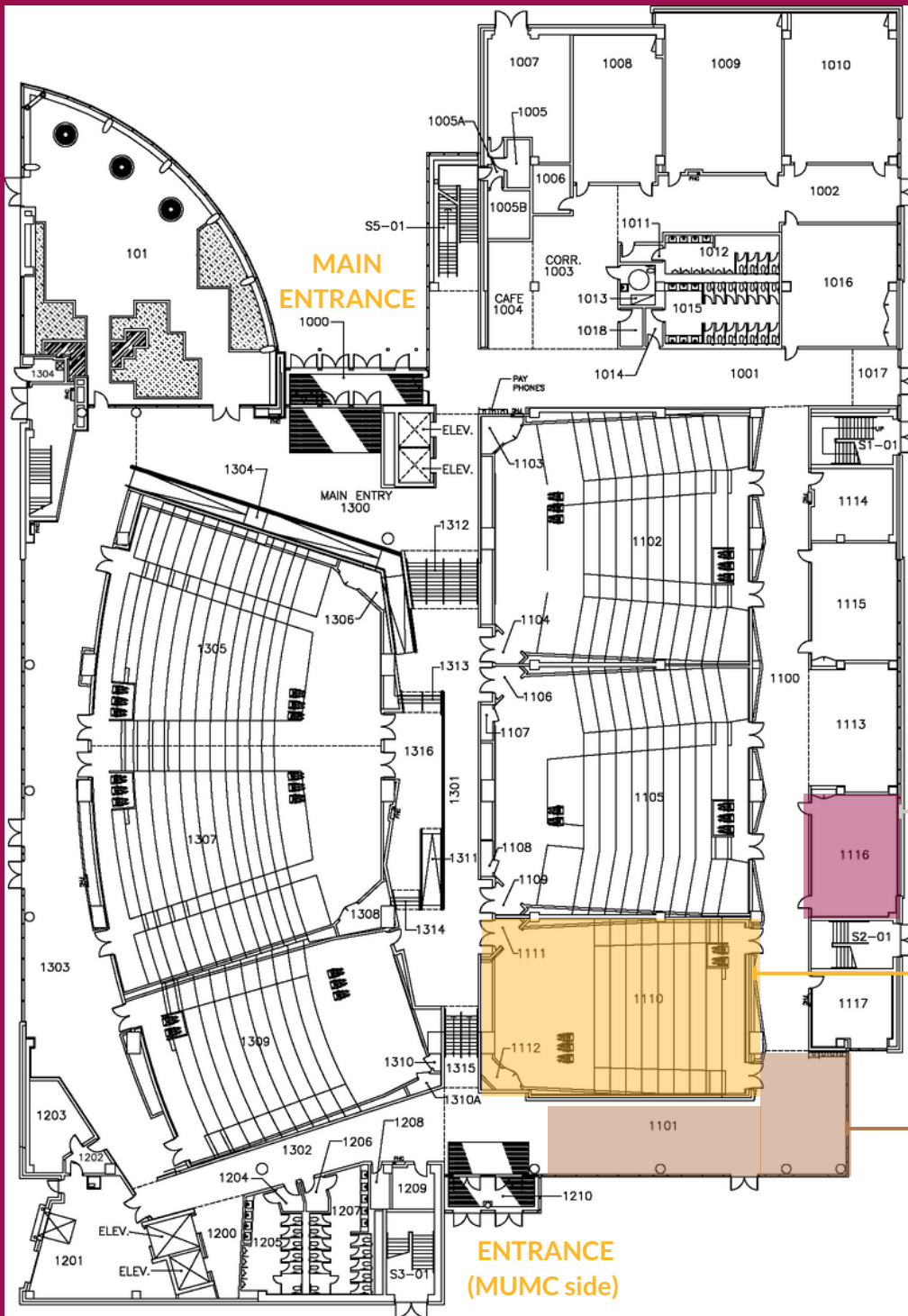
*1116* **PREP@McMaster Panels**

*1110* **Oral Presentations & Keynote**

*1101 (Hall)* **Poster Presentations, Lunch**

**ENTRANCE (MUMC side)**

Michael DeGroote Centre for Learning and Discovery (MDCL)
*First Floor*

MAP

ii

# ACKNOWLEDGEMENTS

Thank you to all of the staff, faculty, and sponsors without whom the 13th annual McMaster Medical Student Research Day would not have been possible!

## KEYNOTE SPEAKER

Dr. Sheila Singh

## JUDGES

Dr. Rae Brager

Dr. Boris Sakic

Dr. Ally Prebtani

Dr. Dorothy Bakker

Dr. Elizabeth McCready

Dr. Taylor Duda

Dr. Jason Profetto

Dr. Rick Ikesaka

Dr. John Lee

Dr. Melissa Lannon

Dr. Christine Wekerle

Dr. Alim Pardhan

Dr. Bruno Losier

Dr. Marina Wang

## FACULTY SUPPORT

Dr. Constantine Samaan

Mike Weir

Ashley Green

## SPONSORS

McMaster Medical Student Council

McMaster Undergraduate Medical Journal

Royal Bank of Canada (RBC)

Royal Bank of Canada Insurance

# MMSC
## McMaster Medical Student Council
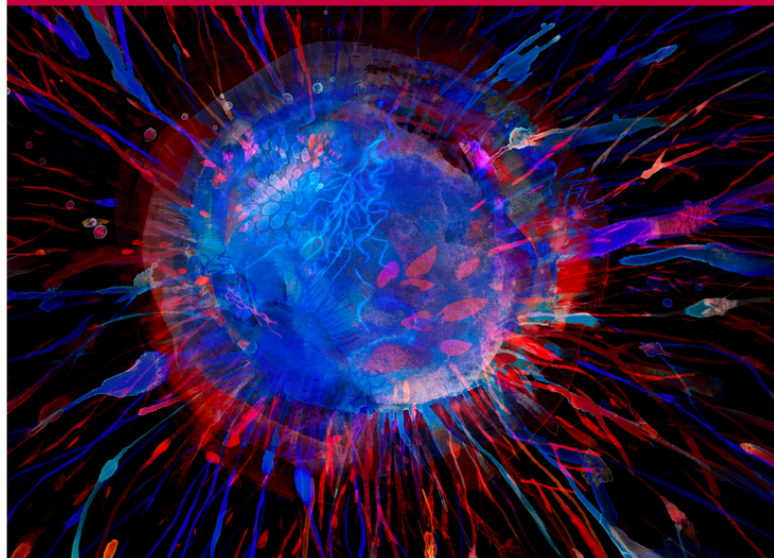
# MUMJ
A PEER-REVIEWED, STUDENT-RUN PUBLICATION

McMaster University Medical Journal

Available online at readmumj.com

v

# OUR HISTORY

## ABOUT MMSRD 2022

Welcome to the 13th 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), Ali Zhang and Charlotte McEwen (2018/19), Mary Boulos and Parnian Pardis (2019/2020), Andrew Chen and Cindy Nguyen (2020/21), Jianhan Wu and Humaira Niazi (2021/22).

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 forward, we hope this conference will continue to grow and provide important opportunities for medical education and networking through the lens of research.

**McMaster** Medical Student Research Day

# WELCOME
## FROM THE CO-CHAIRS

**Dear Students, Faculty, and Community Members,**

We are really excited to welcome you to the 13th annual McMaster Medical Student Research Day (MMSRD)! Each year MMSRD provides an opportunity for medical students to share their contributions to research and academia, as well as showcase their accomplishments. We are thrilled to invite medical students from all across Ontario for a return to an in-person conference! The 2022 MMSRD committee is proud to have created a program filled with exciting presentations, including one from our keynote speaker, Dr. Sheila Singh.

This year we were blown away by the number of high quality abstract submissions made this year despite all the research restrictions that have happened due to the pandemic. This year's conference will showcase a series of posters, 3 minute thesis (3MT), and 7 minute thesis (7MT) presentations. The presentations encompass a wide scope of research fields including: basic and experimental sciences, clinical and epidemiological studies, health services and quality improvement, and health design and innovation. These categories reflect the diversity and strength of research undertaken by students at McMaster and across Ontario. For the fourth year in a row, we have continued to host the Premedical Research Engagement Program (PREP) for undergraduate students interested in pursuing further education in a healthcare profession. We have been delighted to hear about all the meaningful connections mentees and mentors have made and hope that these relationships will continue beyond the research day. We are incredibly appreciative towards several individuals who helped to make this research day possible. First and foremost, we would like to thank the MMSRD 2021 committee chairs and members for all the hard work they have contributed to planning this event. Secondly, we would like to thank Dr. Constantine Samaan, Mike Weir and Ashley Green for their continued assistance with planning the MMSRD. We would also like to thank our sponsors: Royal Bank of Canada (RBC), McMaster University Medical Journal, and McMaster Medical Student Council for their funding and support. Finally, we thank you all for taking the time to participate in this year's research day.

Once again, we are incredibly impressed by the quality of research and are thrilled to organize this research day to showcase it. We hope that you discover unique insights from a breadth of perspectives, and form ties that strengthen our ever-growing community.

Kind regards,

Jianhan Wu and Humaira Niazi

## CO-CHAIRS
JIANHAN WU
HUMAIRA NIAZI

## SPONSORSHIP
ROXANNA WANG

## OUTREACH
MATTHEW FUDA - COMMITTEE CHAIR
DORISA MENG

## JUDGING
VICTORIA MENG

## SCIENTIFIC COMMITTEE

NIKHIL NAIR - COMMITTEE CHAIR
IBRAHIM EBEIDO
JIAN ROUSHANI
VITHUSHAN SURENDRAN
ERIN INGOLDSBY

## LOGISTICS COMMITTEE

EKATERINA AN - COMMITTEE CHAIR
LUCY CHEN
ZAYNAB MALIK

## PREP @MCMASTER
MATTHEW FUDA

# THE TEAM

# KEYNOTE SPEAKER

## DR. SHEILA SINGH

Dr. Sheila Singh is a professor of surgery and biochemistry, chief pediatric neurosurgeon at McMaster Children's Hospital, former Division Head of Neurosurgery at Hamilton Health Sciences, and inaugural director of the new Cancer Research Centre at McMaster University. She holds a Tier 1/ Senior Canada Research Chair in Human Brain Cancer Stem Cell Biology, and is the founding Director of the McMaster Surgeon Scientist Program. Her PhD thesis described the novel identification of a population of cancer stem cells that exclusively drive the formation of brain tumours.

Since 2007, Dr. Singh's lab applies a developmental neurobiology framework to the study of brain tumorigenesis. Building upon previous cell culture techniques developed for the isolation of normal neural stem cells (NSC) and applying them to brain tumours, and through development of a xenograft model to efficiently study brain tumour initiating cell (BTIC) activity, Dr. Singh's lab aims to understand the molecular mechanisms that govern BTIC self- renewal.

Dr. Singh is currently studying the regulation of BTIC signaling pathways in glioblastoma, brain metastases and childhood medulloblastoma, with an ultimate goal of selectively targeting the BTIC with appropriately tailored drug and molecular therapies. Her laboratory is funded by CCSRI, CIHR, TFRI, CRS, the Stem Cell Network, McMaster Surgical Associates, Brain Canada and the Boris Family Fund. She is scientific founder and prior CEO of a start-up company, Empirica Therapeutics, a brain cancer therapeutics company that is seeking new, data-driven and polytherapeutic treatment options for patients with Glioblastoma and brain metastases. Empirica was acquired by Century Therapeutics Inc (Philadelphia) in June 2020, resulting in the creation of a Canadian subsidiary, Century Canada, based in the McMaster Innovation Park in Hamilton.

ix

# PREP@MCMASTER
## JOINS MMSRD

The Pre-medical Research Engagement Program 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.

**PANEL 1**
**REFLECTING ON MY PATH TO MEDICINE**

Rishi Bansal
Dorota Borovsky
Kika Otiono
Katie van Kampen
Claire Lemieux

**PANEL 2**
**NAVIGATING RESEARCH: WHERE DO I START?**

Jian Roushani
Etri Kocaqi
Colin Whaley
Jonah Rakoff

x

# ORAL
## *PRESENTATIONS*

1

# 7-MIN PRESENTATIONS

# #O1 - Acute kidney injury requiring renal replacement therapy in people with COVID-19 disease in Ontario, Canada: a prospective analysis of risk factors and outcomes

Jian Roushani*, Doneal Thomas, Matthew J Oliver, Jane Ip, Yiwen Tang, Angie Yeung, Leena Taji, Rebecca Cooper, Peter O Magner, Amit X Garg, Peter G Blake

(1) Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada
(2) Ontario Renal Network, Ontario Health, Toronto, Canada
(3) Department of Medicine, University of Toronto, Toronto, Canada
(4) Division of Nephrology, University of Ottawa, Ottawa, Canada
(5) Division of Nephrology, Schulich School of Medicine and Dentistry, Western University, London, Canada

**Background**: Severely ill people with COVID-19 are at risk of acute kidney injury treated with renal replacement therapy (AKI-RRT). Understanding of risk factors and outcomes for AKI-RRT is incomplete.

**Objective**: To describe the incidence, time course, outcomes and risk factors for mortality for all COVID 19 patients requiring dialysis for AKI in Ontario, Canada.

**Methods**: We prospectively collected data on the incidence, demographics, area of residence, time course, outcomes, and associated risk factors for all COVID-19 AKI-RRT cases during the first 2 waves of the pandemic in Ontario, Canada.

**Results**: There were 271 people with AKI-RRT, representing 0.1% of all diagnosed SARS-CoV-2 cases. These included 10% of SARS-CoV-2 admissions to intensive care units (ICU). Median age was 65 years, with 11% under 50, 76% were male, 47% non-white, and 48% had diabetes. Overall, 59% resided in the quintile of Ontario neighborhoods with the greatest ethnocultural composition and 51% in the 2 lowest income quintile neighborhoods. Mortality was 58% at 30 days after RRT initiation, and 64% at 90 days. By 90 days, 20% of survivors remained RRT-dependent and 31% were still hospitalized. On multivariable analysis, people aged over 70 had higher mortality (odds ratio (OR) 2.4, 95% CI: 1.3, 4.6). Cases from the second versus the first COVID-19 wave were older, had more baseline co-morbidity, and were more likely to initiate RRT over 2 weeks after SARS-CoV-2 diagnosis (34% vs 14%, p<0.001).

**Conclusions**: AKI-RRT is common in COVID-19 ICU admissions. Residency in areas with high ethnocultural composition and lower socioeconomic status are strong risk factors. Late onset AKI-RRT was more common in the second wave. Mortality is high and 90-day survivors have persisting high morbidity.

# #O2 - Age-related dysregulation of resident muscle stem cells and capillarization

**Matthew R. Fuda\*** (1), Katherine Manta (2), Andrew Mikhail (3), Donald Xhuti (2), Mats I. Nilsson (4), Mark A. Tarnopolsky (2,4), Joshua P. Nederveen (2)

(1) Faculty of Health Sciences, Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) Department of Pediatrics, McMaster University Medical Centre (MUMC), Hamilton, Ontario, Canada; (3) Department of Kinesiology, McMaster University, Hamilton, Ontario, Canada; (4) Exerkine Corporation, MUMC, Hamilton, Ontario, Canada

**INTRODUCTION**: The decline in age-related muscle mass, known as sarcopenia, continues to increase in an ever-aging population. The inability to maintain muscle mass with age in addition to other age-related comorbidities such as COPD and cardiovascular disease has resulted in decreased independence of the elderly population and increasing healthcare costs. The decrease in muscle mass predominantly has been attributed to a plethora of factors, including the decline in the pool of resident muscle stem cells and capillarization. The muscle resident progenitor stem cells, known as satellite cells (SCs), are unequivocally responsible for the repair and maintenance of muscle fibres and have been shown to decrease with age. However, recent evidence would illustrate that there are multiple other progenitor stem cells implicated in this process including fibro-adipogenic PDGFRα+ cells and Twist2 (Tw2+) cells - the latter of which have not been identified in human aging muscle. Training has also been shown to improve this decline in muscle mass, but its relationship with these muscle stem cells has not been well elucidated.

**HYPOTHESIS/OBJECTIVES**: Therefore, we set out to investigate the impacts of aging as well as training on muscle stem cells and capillarization. We hypothesized that Tw2+ cells will increase with aging to attempt to compensate for the hypothesized decrease in SCs.

**METHODS**: To fulfill this investigation we performed immunohistochemistry on young (n = 21) and elderly (n = 63) adult men to determine muscle cross sectional area (CSA), capillarization, SC, PDGFRα+, M2c macrophages, and Tw2+ cell content.

**RESULTS**: Our results confirm that SCs decrease with age, specifically those associated with type II fibres ($p < 0.05$). We observed that PDGFRα+ cells did not change with age except within the older sarcopenic subgroup. We also found that Tw2+ cells increase in type I fibres with age, especially in the obese subgroup ($p < 0.05$). Lastly, we found that there was a negative correlation between Tw2+ cell density and type II CSA ($p < 0.05$).

**DISCUSSION/CONCLUSIONS**: These results suggest that the muscle resident stem cell Tw2+ population increases with age in a fibre-type specific manner, suggesting a relationship with sarcopenia. Furthermore, they may increase to compensate for the decline in SCs.

# #O3 - Unintentional pediatric cannabis exposures after legalization of recreational cannabis in Canada

Daniel T Myran(1), **Nathan Cantor(1)**, Yaron Finkelstein(2), Michael Pugliese(3), Astrid Guttmann(3), Rebecca Jesseman(4), Peter Tanuseputro(5)

(1) Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, Ontario, Canada; (2) Department of Pediatrics, University of Toronto, Toronto, Ontario, Canada; (3) ICES (formerly the Institute for Clinical Evaluative Sciences), Ontario, Canada; (4) Canadian Centre on Substance Use and Addiction, Ottawa, Ontario, Canada; (5) Department of Medicine, Ottawa Hospital Research Institute, University of Ottawa, Ottawa, Ontario, Canada

**Introduction**: Canada legalized recreational cannabis in October 2018; however, commercial cannabis edibles (e.g., pre-packaged gummies) only became available in late January 2020. This study compares the incidence and severity of emergency department (ED) visits due to accidental pediatric cannabis exposures before and after recreational cannabis legalization and the introduction of commerlized cannabis edibles in Ontario, Canada.

**Methods**: We performed a repeated, cross-sectional study of all ED visits in children aged 0 to 9 years in Ontario (n=2.35 million) due to cannabis exposures between January 1, 2016 and March 31, 2021. Time periods were stratified by pre-legalization (Jan. 2016 - September 2018), legalization without commercial cannabis edibles (Oct. 2018 - Jan. 2020; Cannabis 1.0) and legalization with commercial cannabis edibles (Feb. 2020 - March 2021; Cannabis 2.0).

**Results**: 522 ED visits due to cannabis exposures in children aged 0-9 occurred during the study. The mean age was 3.8 years (SD = 2.6) and 58.3% were male. The rate of ED visits due to cannabis exposures was more than 3 times higher (Incidence Rate Ratio [IRR] 3.13, 95% CI 2.37, 4.16) during Cannabis 1.0 (6.14 annual visits per 100,000) and 9 times higher (IRR 9.12, 95% CI 7.15, 11.65) during Cannabis 2.0 (17.75 annual visits per 100,000) compared to the pre-legalization rate (1.96 annual visits per 100,000). After adjusting for pre-legalization time trends, Cannabis 2.0, but not Cannabis 1.0 was associated with a significant increase in visits. A greater proportion of ED visits resulted in hospitalization during Cannabis 2.0 (38.5%, n = 122) compared to Cannabis 1.0 (24.7%, n=20) and pre-legalization (23.4%, n=29).

**Conclusion**: Rates of ED visits due to pediatric cannabis exposures and the severity of visits increased following the legalization of recreational cannabis and intensified after commercial cannabis edibles were introduced.

# #O4 - Successful Same-day Discharge for Robot-Assisted Radical Prostatectomy: A Systematic Review and Meta-analysis

Michael Uy (1), Braden Millan (1), **Conor Jones*** (2), David Sands (1), Edward Matsumoto (1, 3), Benjamin Bay (1, 3), Bobby Shayegan (1, 3)

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

**Introduction:** Advances in enhanced recovery after surgery (ERAS) pathways have shorted time to discharge for patients undergoing robot-assisted radical prostatectomy (RARP). Mean length of stay following RARP is typically 24-48 hours, however, recent work has focused on the safety and benefits of same-day discharge (SDD).

**Purpose:** Same day discharge (SDD) following robot-assisted radical prostatectomy (RARP) is emerging as the standard of care. We conducted a systematic review and meta-analysis to evaluate the differences in peri-operative characteristics, complication/readmissions rates, and satisfaction/cost data, between in-patient (IP) RARP versus SDD-RARP.

**Materials and Methods:** This study was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines and was prospectively registered with PROSPERO (CRD42021258848). A comprehensive search of PubMed, Embase, Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, and conference abstract publications was performed. A leave-one-out sensitivity analysis was performed to control for heterogeneity and risk of bias.

**Results:** A total of 14 studies were included with a pooled population of 3795 patients, including 2348 (61.9%) IP-RARPs and 1447 (38.1%) SDD-RARPs. SDD pathways varied, though many commonalities were present in patient selection, peri-operative recommendations, and post-operative management. When compared to IP-RARP, SDD-RARP had no differences in $\geqslant$ Grade 3 Clavien−Dindo complications (RR: 0.4, 95% CI 0.2, 1.1, p = 0.07), 90-day readmission rates (RR: 0.6, 95% CI 0.3, 1.1, p = 0.10), or unscheduled ED visits (RR: 1.0, 95% CI 0.3, 3.1, p = 0.97). Cost savings per patient ranged between $367-2109 USD, and overall satisfaction was high between 87.5-100%.

**Conclusions:** Same day discharge following RARP is both feasible and safe, while offering healthcare cost-savings with high patient satisfaction rates. Data from this study will inform the uptake and development of future SDD pathways in contemporary urological care such that it may be offered to a broader patient population.

# #O5 - Virtual Interprofessional Education: Building a Novel Theoretical Model for Interprofessional Learning in the Virtual Space

Arden Azim MD(1), **Etri Kocaqi*** BSc(1), Sarah Wojkowski PT PhD(1), Derya Uzelli Yilmaz RN PhD(3), Sarah Foohey MD(2), Matt Sibbald MD MHPE MSc PhD(1)

(1)McMaster University, Hamilton
(2)Queen's University, Kingston
(3)Izmir Katip Celebi University, Izmir, Turkey

**Background**: Virtual interprofessional education (IPE) has emerged as a promising alternative to traditional in-person IPE. However, theoretical frameworks to support virtual interprofessional learning are not well elaborated. Two theoretical frameworks are relevant to virtual IPE: (1) the Canadian Interprofessional Health Collaborative (CIHC) interprofessional learning framework and (2) Dornan's Experience-Based Learning Model (ExBL) of workplace learning. In this study, we sought to explore virtual IPE using both frameworks to develop new theoretical understandings and identify assumptions, gaps and barriers.

**Methods**: We conducted 17 semi-structured interviews with medical and nursing student participants (n = 14) and facilitators (n =3) after two virtual IPE workshops. Transcripts were analyzed qualitatively in an iterative process, informed by the CIHC framework and Dornan's ExBL model and using directed content analysis. Emerging themes were explored using novel mind-mapping transitional coding. Data collection and analysis was continued until themes emerged with adequate conceptual depth, relevance and plausibility.

**Results**: Three themes emerged: emphasis of the personal over the professional, decreased sociologic fidelity, and threatened interpersonal connections. Professional distinctions and hierarchies are blurred virtually. This contributed to an increased sense of psychological safety among most learners and lowered the threshold for participation. Separation from the sociologic complexity of the workplace facilitated communication and role clarification objectives. However, loss of immersion virtually may limit deeper engagement. Interprofessional objectives that rely on deeper sociological fidelity, such as conflict resolution, may be threatened. Informal interactions between learners are also hindered, which may threaten organic development of interprofessional relationships.

**Conclusions**: Role clarification and communication objectives are preserved in virtual IPE. Educators should pay close attention to psychological safety and sociologic fidelity – both to leverage advantages and guard against threats to connection and transferability. Virtual IPE may be well-suited as a primer to in-person activities, or as scaffolding towards interprofessional practice.

# #O6 - Myocardial injury after Gynecologic Oncology Surgery in Septuagenarians and Octogenarians: Is There a Role For Routine Postoperative Cardiac Biomarker Monitoring?

**Tharani Anpalagan*** (1) Kathy Huang (1) Maura Marcucci (1, 2) Sarah J Mah (3) Millie Walker (3) Clare Reade (3) Waldo Jimenez (3) Lua Eiriksson (3) Vanessa Carlson (3) Julie My Van Nguyen (3)

(1) DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Department of Internal Medicine, Hamilton Health Sciences, Hamilton, Ontario, Canada
(3) Department of Gynecologic Oncology, Juravinski Hospital, Hamilton, Ontario, Canada

**Background:** Accumulating evidence correlates myocardial injury after noncardiac surgery (MINS), even when asymptomatic, with increased future cardiac and non-cardiac morbidity and mortality. There is no literature on MINS specific to Gynecologic Oncology.

**Hypothesis/Question/Objective:** We sought to evaluate the incidence and risk factors of MINS in patients aged ⩾70.

**Methods:** Elective laparotomies between 01/2016-09/2020 for patients aged⩾70 at a tertiary hospital in ON, Canada, were reviewed using prospectively-collected National Surgical Quality Improvement Program (NSQIP) data. MINS was defined as peak serum high-sensitivity troponin-T concentration⩾0.04ng/mL within 30 days postoperatively. Logistic regression analysis was performed.

**Results:** In this cohort of 258 patients, of 242 (93.8%) who underwent postoperative troponin screening, 40 (16.5%) experienced MINS without exhibiting ischemic symptoms or ECG changes. The diagnosis of MINS led to prescription or optimization of cardiovascular medications for 35 patients (87.5%).On univariate analysis, Revised Cardiac Risk Index (RCRI) of 3-5(p=0.002), history of coronary artery disease (p=0.003) or insulin-dependent diabetes (p=0.006), preoperative use of antiplatelets (p=0.009), beta-blockers (p=0.02), ACE-inhibitors (ACEI) or angiotensin-receptor blockers (ARB)(p=0.002) and frailty as defined by the NSQIP modified frailty index-5 (p=0.02), were associated with greater risk of MINS. Factors reflecting surgical complexity including surgical complexity score, operative duration, blood loss and advanced oncologic stage, were not predictive. Multivariable analysis using backward selection procedure identified elevated RCRI and preoperative ACE/ARB as significant risk factors (OR 5.93, 95% CI 1.52-24.31, p=0.01 and OR 2.4, 95% CI 1.18-5.06, p=0.02).

**Conclusion:** One in 6 patients in our Gynecologic Oncology cohort experienced asymptomatic MINS, irrespective of surgical complexity. Our analysis highlights a possible opportunity to optimize cardiac risk factors and to potentially improve perioperative patient safety by reducing morbidity. Routine preoperative cardiac risk-stratification and postoperative cardiac biomarkers monitoring should be considered in elderly patients with gynecologic malignancies.

# 3-MIN PRESENTATIONS

# #O7 - Including indications on prescriptions and medication labels for sensitive medications: a mixed methods study

**Colin Whaley***(1,2), George Daskalakis (2), Moses Tetui (2), Marjory Phillips (3,4), Kelly Grindrod (2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada
(2) School of Pharmacy, University of Waterloo, Waterloo, ON, Canada
(3) Department of Psychology, University of Waterloo, Waterloo, ON, Canada
(4) Centre for Mental Health Research and Treatment, University of Waterloo, Waterloo, ON, Canada

**Introduction**: Medications are core to modern medicine, however their reason for use (RFU), are not routinely included on prescriptions sent to pharmacies or on medication labels. People who use medications which treat commonly stigmatized conditions, such as mental health illnesses or sexually transmitted illnesses, may have unique concerns when considering the addition of RFU to prescriptions and medication labels.

**Objective**: What are the perspectives of patients who take medications to treat sensitive conditions about adding RFU to (1) prescriptions sent to pharmacies and (2) medication labels?

**Methods**: 20 participants completed a survey and semi-structured interview. Descriptive analysis was conducted for the quantitative data and thematic analysis for the qualitative. A convergent mixed methods design was used to integrate the data into a joint display.

**Results**:More participants felt comfortable with RFU being transmitted electronically (60%) than via paper prescription (45%), with only 20% feeling comfortable with RFU being included on medication labels. Participants more greatly favoured RFU being added on an opt-in basis (65%) versus opt-out (35%). The five main qualitative themes include: relational aspects of medication use, logistical aspects of RFU, personal aspects of medication use, the role of prescribers, and the role of pharmacists.

**Discussion**: Existing literature highlights the value of sharing RFU with different stakeholders. In this study, the prescription delivery method impacted participants' comfort with RFU included on prescriptions, and many indicated they wanted to explicitly opt in to RFU being sent to pharmacies. These are reflected in the personal and relational aspects of medication use themes, and indicate participants' desire to have control over their RFU for intrinsic (eg, being triggered by seeing RFU) and extrinsic (eg, wanting to eliminate stigma and maintain their privacy) reasons. This work has implications for how RFU can be communicated amongst a healthcare team.

# #O8 - Beta-blockers in Traumatic Brain Injury: A Systematic Review and Meta-Analysis

Shannon Hart (1), Melissa Lannon (1), **Andrew T. Chen\*** (1), Amanda Martyniuk (1), Sunjay Sharma (1), Paul T. Engels (2)

(1) Division of Neurosurgery, McMaster University, Hamilton, Ontario, Canada (2) Departments of Surgery and Critical Care, McMaster University, Hamilton, Ontario

**Purpose**: Traumatic Brain Injury (TBI) is a major cause of death and disability worldwide. Beta blockers have shown promise in improving mortality and functional outcomes after TBI. The aim of this article is to synthesize the available clinical data on the use of beta blockers in acute TBI.

**Methods**: A systematic search was conducted through MEDLINE, EMBASE, and Cochrane Library for studies including one or more outcome of interest associated with beta blocker use in TBI. Independent reviewers evaluated quality of the studies and extracted data on patients receiving beta blockers compared to placebo or non-intervention. Pooled estimates, confidence intervals (CIs), and risk ratios (RRs) or odds ratios (ORs) were calculated for all outcomes.

**Results**: A total of 13,244 patients from 17 studies were eligible for analysis. Two trials were randomized, 15 were observational. Pooled analysis demonstrated a significant mortality benefit of beta blocker use overall (RR 0.8; 95% CI 0.68-0.94, I2= 75%). Subgroup analysis of patients with no pre-injury beta blocker use did not show any difference in mortality (RR 0.99; 95% CI 0.7-1.39, I2=84%). There was no difference in rate of good functional outcome at hospital discharge (OR 0.94; 95% CI 0.56-1.58, I2=65%), however beta blockers demonstrated a functional benefit at longer term follow-up (OR 1.75; 95% CI 1.09-2.8, I2=0%). Cardiopulmonary and infectious complications were more likely to occur in patients who received beta blockers (RR 1.94; 95% CI 1.69-2.24, I2=0%; RR 2.36; 95% CI 1.42-3.91, I2=88%). Overall quality of the evidence was very low.

**Conclusions**: Beta blocker use is associated with a decrease in mortality at acute care discharge. Mortality benefit was limited to patients who had been on beta-blockers prior to the injury. Lack of high-quality evidence limited definitive recommendations for beta blocker use in TBI, therefore high quality, blinded RCTs are needed to further elucidate the utility of beta blockers in TBI.

## #O9 - Oral anticoagulation versus antiplatelet therapy for secondary stroke prevention in patients with embolic stroke of undetermined source: a systematic review and meta-analysis

**Nikhil Nair Hariharan***(1), Kashyap Patel (2), Omaike Sikder (3), Kanjana S Perera (4)(5), Hans-Christoph Diener (6), Robert G Hart (3)(4)(5), John W Eikelboom (3)(4)(5)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada
(2) School of Medicine, University of Ottawa, Ottawa, ON, Canada
(3) McMaster University, Hamilton, ON, Canada
(4) Hamilton Health Sciences, McMaster University, Hamilton, ON, Canada
(5) Population Health Research Institute, Hamilton, ON, Canada
(6) University of Duisburg-Essen, Duisburg, Germany

**Introduction/Objective:** We performed a systematic review and meta-analysis of randomized controlled trials (RCTs) to evaluate the efficacy and safety of direct oral anticoagulation (DOAC) compared with antiplatelet therapy for secondary stroke prevention in adult patients with embolic stroke of undetermined source (ESUS).

**Methods:** We searched major databases (Embase, MEDLINE, CINAHL, CENTRAL, and Web of Science) for RCTs published until March 2021. The primary outcome was recurrent stroke, and the main safety outcomes were major bleeding and clinically relevant non-major bleeding (CRNB). We assessed risk of bias using the Cochrane Risk of Bias tool. We used a random-effects model to determine pooled risk ratios and 95% confidence intervals in the datasets and key subgroups.

**Results:** Our search identified two RCTs, involving a total of 12,603 patients with ESUS. Anticoagulation with dabigatran or rivaroxaban compared with aspirin did not reduce the risk of recurrent stroke (RR, 0.96 [0.76–1.20]) or increase major bleeding (RR, 1.77 [0.80–3.89]) but significantly increased the composite of major or clinically relevant non-major bleeding (RR, 1.57 [1.26–1.97]). Prespecified subgroup analysis demonstrated consistent results according to age and sex. Additional post-hoc subgroup analyses demonstrated consistent results according to prior stroke and presence of a patent foramen ovale but suggested that DOACs reduced recurrent stroke in patients with an estimated glomerular filtration rate (eGFR) <50 and 50-80 ml/min but not in those with eGFR >80 ml/min (interaction P = 0.0234).

**Discussion/conclusions:** Direct oral anticoagulations are not more effective than aspirin in preventing stroke recurrence in patients with ESUS and increase bleeding.

# #O10 - Lymph Node Harvest as a Predictor of Survival for Colon Cancer: A Systematic Review and Meta-Analysis

**Simarpreet Ichhpuniani\*** (1), Tyler McKechnie (2), Jay Lee (1), Jeremy Biro (1), Yung Lee (2), Lily Park (2), Aristithes Doumouras (2)(3), Dennis Hong (2)(3), Cagla Eskicioglu (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's Healthcare, Hamilton, Ontario, Canada

**Background:**  Lymph node metastases in colon cancer impact staging, treatment decisions, and prognosis. The number of lymph nodes found to be harboring metastasis can be impacted by the number of lymph nodes harvested. Current guidelines recommend a lymph node harvest of 12 for adequate lymphadenectomy in order to predict long-term oncologic outcomes, yet different cut-offs have not been evaluated. The aim of this review was to determine cut-offs that may predict survival outcomes.

**Methods:** Medline, Embase, and CENTRAL were systematically searched. Articles were included if they compared five-year overall survival (OS) or disease-free survival (DFS) above and below a pre-defined lymph node harvest cut-off. Studies solely examining lymph node harvest in rectal cancer patients or in patients with stage IV disease were excluded. Pairwise meta-analyses using inverse variance random effects were performed.

**Results:** From 2587 citations, 21 studies with a total of 854,359 patients (51.9% female, mean age: 68.9) were included. Overall, 19 of these studies were included in quantitative synthesis. A lymph node harvest of greater than 12 was a predictor of improved five-year OS (7 studies; OR 1.11, 95% CI 1.08-1.14, $p<0.00001$). A lymph node harvest cut-off as low as 7 was associated with improved five-year OS (2 studies; OR 1.16, 95% CI 1.08-1.25, $p<0.0001$) and DFS (3 studies; OS 1.66, 95% CI 1.32-2.10, $p<0.00001$). All lymph node harvest cut-offs greater than 12 were associated with better five-year survival data (i.e., 13, 17).

**Conclusions:** A lymph node cut-off of 12 distinguishes differences in five-year oncologic outcomes. Contrarily, lymph node harvests other than 12 have not been rigorously studied and thus lack the statistical power to derive meaningful conclusions compared to the 12-lymph node cut-off. Nonetheless, it is possible that a lymph node harvest cutoffs less than 12 may be adequate in predicting long-term survival. Further prospective study evaluating cut-offs below 12 are warranted.

# #O11 - Efficacy of ultrasound-guided nerve hydrodissection: A retrospective chart review

**Monica Sabbineni***(1), Vishal Varma(2), Brian Wang(2), Hema N Choudur(2)

(1) Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada; (2) Department of Radiology, McMaster University, Hamilton, Ontario, Canada

**Background**: Ultrasound-guided nerve hydrodissection is a relatively novel therapeutic technique to treat peripheral nerve entrapment. High-resolution ultrasound for superficial soft tissue visualization provides a rapid, reliable, and dynamic tool to evaluate a variety of peripheral nerves. Ultrasound-guided hydrodissection involves image-guided injection of a sterile solution (e.g. saline, local anesthetic) under pressure with the needle localized to the immediate vicinity of the entrapped nerve.

**Objective**: To determine the efficacy of ultrasound-guided nerve hydrodissection for the clinical improvement of commonly entrapped peripheral nerves.

**Methods**: A retrospective review of patient information was conducted for the period of Jan 2015-Dec 2020. Potential patients were identified using a keyword search for "hydrodissection" and/or "perineural injection" from radiology reports. Data included patient age, patient sex, intervention date, target peripheral nerve, pre-intervention clinical presentation, EMG data, and patient outcomes at 3 weeks, 3 months, and 6 months post-procedure. Outcomes included pain (as rated on the Visual Analog Scale, 1-10), numbness, tingling, paraesthesias, mobility, and other. The data was used to assess intervention efficacy on the basis of each peripheral nerve as well as total peripheral nerves.

**Results**: Data was extracted for 204 patients for various peripheral nerves. At 3 weeks follow up, 48% demonstrated minimal improvement, 18% demonstrated moderate improvement, and 34% demonstrated significant improvement. At 3 months follow up, 52% demonstrated minimal improvement, 20% demonstrated moderate improvement, and 28% demonstrated significant improvement. Finally, at 6 months follow up, 56% demonstrated minimal improvement, 14% demonstrated moderate improvement, and 30% demonstrated significant improvement.

**Conclusion**: Ultrasound-guided nerve hydrodissection provides minimal improvement in approximately half of patients referred for the procedure and moderate to significant clinical improvement in the remaining half of patients. Given these results, we believe this procedure has the potential to be used for the release of entrapped peripheral nerves as an alternative to surgical release.

# #O12 - A quantitative analysis investigating the prevalence of "manels" in major orthopaedic surgery meetings

**Prushoth Vivekanantha\*** (1), Andre Dao (2), Ajay Shah (3), Jay Toor (3), Maegan Shields (3), Andrea Chan (3), Kim Tsoi (3), Veronica Wadey (3), Peter Ferguson (3)

(1) Michael DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) School of Medicine, Queens University, Kingston, Ontario, Canada; (3) Division of Orthopaedic Surgery, University of Toronto, Toronto, Ontario, Canada

**Introduction**: Surgery is known to have issues with equity, diversity, and inclusivity across the world. In particular, Orthopaedic surgery is notorious for having a low percentage of women in the field. The purpose of this study was to investigate the prevalence of "manels", or male-only sessions, in ten major Orthopaedic Surgery meetings and to quantify the differences in academic and research qualifications between male and female faculty.

**Hypothesis**: It is hypothesized that male speakers compose of a disproportionate percentage of panelists, despite having no difference in their experience or research contributions.

**Methods**: Ten Orthopaedic conferences (AAHKS, AAHS, AAOS, AOSSM, COA, EFORT, NASS, ORS, OTA, POSNA) from January 2021 to November 2021 were analyzed. Primary outcomes included the percentage of male faculty speakers/moderators and percentage of 'manels'. Mean number of sessions for male and female were compared after being stratified into quartiles based on publications, sum of times cited, and H-indexes.

**Results**: Of 207 included sessions, 121 (58.5%) were manels and the mean percentage of male faculty speakers was 87.4%. The COA, ORS and POSNA had the most balanced gender representation. Non-manel sessions had a greater mean number of chairs (p<0.001), speakers (p<0.001), and faculty (p<0.001) than manel sessions. Mean number of sessions between male and female faculty within their respective quartiles of H-indexes, sum of times cited, and number of publications did not reach statistical significance.

**Conclusion**: There is a high prevalence of manels and an overall lack of female representation in Orthopaedic meetings. We recommend associations to mandate diversity strategies, focused on recruiting gender-equitable leadership, quota for minimum women speakers/moderators, and facilitating women mentorship events at conferences.

# #O13 - Local arterial stiffness assessment on humans: comparison between the use of the Bramwell-Hill equation and the direct pulse wave velocity assessed by ultrafast ultrasound imaging

**Rahna K. Rasouli***(1,2), Jerome Baranger(1), Ca,eron Slorach(1), Minh Nguyen(1), Patrick Segers(3), Vitor Guerra(1), Mathieu Pernot(4), Wei Hui(1), Luc Mertens(1), and Olivier Villemain(1)

(1) Division of Cardiology, Department of Pediatrics, The Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada; (2) Temerty Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada; (3) Ghent University, Institute Biomedical Technology, De Pintelaan 185, Gent 9000, Belgium; (4) Physics for Medicine Paris, INSERM U1273, ESPCI Paris, CNRS UMR 8063, PSL Research University, Paris, France.

**Background**: Pulse wave velocity (PWV), which is the propagation speed of the systolic pressure wave through an arterial wall, is the clinical surrogate to assess arterial stiffness. Currently, the most common clinical tool for measuring local PWV is the theoretical Bramwell-Hill (B-H) equation. Ultrafast ultrasound imaging (UUI) is able to directly measure local PWV through imaging with high temporal resolution.

**Objective**: This study compares local carotid PWV measured by the B-H equation and UUI at rest and during exercise.

**Methods**: 21 healthy volunteers aged between 13 and 49 years were enrolled in an exercise trial at the Hospital for Sick Children. Demographic and clinical data were collected from the participants and carotid properties (intima-media thickness, distensibility, β-index) were obtained by ultrasound. PWV assessment by B-H equation and by UUI were performed at rest and at submaximal exercise. Data were analysed using Students t-tests, Bland-Altman plots, and Pearson correlation analysis.

**Results**: The average age of participants was 25.9 +/- 8.9 years. On average, the B-H equation significantly underestimated the PWV compared to UUI measurement in both rest (4.25 vs 6.65 m/s) and exercise (4.48 vs. 8.13 m/s) conditions (p<0.001). On Bland-Altman plot analysis, the underestimation of the B-H method is more pronounced at higher velocities ($R^2$ = 0.58). At rest and during exercise, PWV by UUI was positively correlated to age (p<0.05), weight (p<0.01), and diastolic parameters [minimum carotid diameter (p<0.01) and diastolic blood pressure (p<0.05)], but PWV by B-H was not (p>0.05 for each of these parameters, except for age at rest (p=0.006)).

**Conclusion**: PWV assessed by UUI is strongly correlated with diastolic blood pressure and passive stiffness properties of the arterial wall. UUI is able to replace B-H in estimating local PWV in a clinical setting to monitor stiffness progression and cardiovascular health more accurately.

16

# POSTER
# *PRESENTATIONS*

# MEDICAL EDUCATION

# #P1 - Does anybody have a map? Mapping of pediatric undergraduate problem-based learning objectives (virtual poster)

**Devika Singh\*(1),** Nina Mazze(2), Jennifer Mackenzie(2), Vicky R. Breakey(2)

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

**Background**: Problem-based learning (PBL) is a well-established teaching method in undergraduate medical education. Pediatric-focused PBL is associated with increased problem-solving and clinical reasoning in medical students. The pre-clerkship curriculum at McMaster University is built on PBL cases that include some pediatric cases. The purpose of this study was to map the PBL curriculum to the national pediatrics learning objectives. These objectives focus on pediatric clinical presentations based on the CanMEDS competency framework (https://www.pupdoc.ca/en/canuc-paeds).

**Methods**: All pediatric pre-clerkship PBL content (36/150 PBL cases) was identified within the curriculum. Key objectives are provided to students, who develop enabling objectives with the support of tutors who facilitate the sessions. These mandatory learning objectives were mapped to the canuc-paeds objectives.

**Results**: There were 15/29 canuc-paeds clinical presentations included in the PBL curriculum. Clinical presentations not included in the mandatory PBL learning objectives included core pediatric topics, such as: neonatal jaundice, rash, fever, abdominal pain and acute care topics such as altered level of consciousness and recognizing an acutely ill child.

**Conclusion**: Mapping PBL cases to the canuc-paeds clinical presentations provides valuable insight into the current state of the pre-clerkship content and identifies gaps in the curriculum. Opportunities exist to address gaps in the curriculum by renewing existing cases or developing new content. Additional educational initiatives can be developed to optimize the clerkship curriculum. The process can be generalized to other programs.

# #P2 - Augmented and mixed reality to support clinical decision making

Nicholas James*(1,2), Mark Mackie(1,2), Adam Sirek(1,2)

(1) Schulich School of Medicine & Dentistry, Western University, London, Ontario, Canada;
(2) Institute for Earth and Space Exploration, Western University, London, Ontario, Canada
Content of abstract: bold the headings (ie: background)

**Background**:  Communication delays for exploration class space missions pose a significant challenge to the delivery of medical care. Current management paradigms rely on medical experts on Earth guiding crewmembers through diagnosis and treatment protocols. Future crew medical officers will require autonomous tools to provide them with the knowledge, skills, and judgement needed to manage various medical conditions.

**Objective**:  The objective of our study was to examine the available medical literature and assess the current, published capabilities of augmented reality (AR) and mixed reality (MR) modalities specifically related to clinical decision-making support during long-duration spaceflight.

**Methods**: A comprehensive literature search was conducted using MEDLINE (Ovid), Web of Science, and Scopus to identify relevant articles published between January 2010 and August 2021. This search yielded a total of 934 articles for title and abstract review. Abstracts were screened for inclusion and exclusion criteria by two independent reviewers. Subsequently, included full text manuscripts were reviewed and analyzed.

**Results**: Of the reviewed manuscripts, many focused on the transfer of medical knowledge through enhanced access to information overlaid digitally onto the real world or specific skill guidance. Skill guidance was the predominant use of AR and MR, as would be expected, in the surgical subspecialties evaluating these technologies. Few studies measured enhanced clinical judgement as an outcome.

**Discussion**:  Extended realities are a promising solution for medical support infrastructure in exploration class space missions. AR and MR technologies have been successfully developed and are currently being utilized to enhance medical training, provide guidance during medical procedures, and support surgeons intraoperatively. Despite these significant advances, little research has been done examining the potential application of these technologies as autonomous clinical decision-making tools. The lack of data in this area presents an important field of research with clear benefits to both spaceflight and remote or resource-limited terrestrial environments.

# #P3 - A systematic review of educational interventions to improve ergonomic performance in performance in gastrointestinal endoscopy

**Rishi Bansal***(1), Michael A. Scaffidi(1), Nikko Gimpaya(1), Andras B. Fecso(1,2), Rishad Khan(1,2), Juana Li(1), Nazi Torabi(3), Amandeep K. Shergill(4), Samir C. Grover(1,2)

(1) Division of Gastroenterology, St. Michael's Hospital, Toronto, Ontario, Canada
(2) Department of Medicine, University of Toronto, Toronto, Ontario, Canada
(3) Scotiabank Health Sciences Library, St. Michael's Hospital, Toronto, Ontario, Canada
(4) Medicine, Gastroenterology, San Francisco VA Medical Center/ University of CA, San Francisco, San Francisco, CA

**Background**: Physicians in procedural specialties, such as gastrointestinal endoscopy, are at a high risk of musculoskeletal injuries (MSPI) which can affect physician wellness and productivity. Training in ergonomic principles for endoscopy may help reduce the incidence of MSPI.

**Objective**: The aim of this review was to identify educational interventions using ergonomics that may reduce MSPI and pain from GI endoscopy.

**Methods**: We conducted a systematic search following PRESS guidelines in MEDLINE, EMBASE, PsycINFO, Web of Science, Scopus, the Cochrane Central Register of Controlled Trials and the Cochrane Database of Systematic Reviews for articles published from inception to December 16, 2020. Studies were included if they investigated educational interventions aimed at changing knowledge and/or behaviours related to ergonomics in gastrointestinal endoscopy. After screening and full-text review, we extracted data on the study design, participants, type of training and assessment of primary outcomes. We evaluated study quality with the Medical Education Research Study Quality Instrument (MERSQI). A qualitative synthesis of the data was conducted.

**Results**: Of the initial 575 records identified in the search, 5 met inclusion criteria for qualitative synthesis. We found that most studies (n=4, 90%) were single armed interventional studies that were conducted in simulated and/or clinical settings. The most common types of intervention were didactic sessions and/or videos (n=4, 80%). Other interventions included individualized feedback (n=2, 40%), checklists (n=2, 40%), and simulated training (n=1, 20%). Two (40%) studies used both standardized assessment studies and formal statistical analyses to assess primary outcomes. All included studies reported a benefit of their interventions on their respective dimensions assessed for ergonomics. The mean MERSQI score was 9.7.

**Conclusion**: There is emerging literature demonstrating the effectiveness of interventions to improve ergonomic performance in gastrointestinal endoscopy, which is likely to reduce MSPI among endoscopists. Further higher quality research is required to make robust recommendations.

# #P4 - Assessing the need for and utility of psychiatry clerkship modules at McMaster University, Niagara Regional Campus (NRC) – a student's perspective

**Anne-Sophie, Fortier**\*(3), \*Rahul, Jayachandiran (3), \*Sajine, Sathiaselan (3), \*Ann, Karamysh (3), and Dr. Catherine Krasnik (1, 2)

(1) MD/PhD, Psychiatrist, Niagara Health System, St Catharines, Ontario, Canada; (2) Department of Psychiatry and Behavioural Neurosciences, McMaster University, Hamilton, Ontario, Canada; (3) Michael DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada

**Background**: Web-based self-directed learning has been solidified as an instrumental part of medical training by the COVID-19 pandemic. With restricted in-person clinical placements, virtual learning via recorded lectures and online resources filled the gaps, albeit imperfectly. While in-person medical school clerkships are now possible, virtual learning continues to be an important vehicle for medical education; recent literature supports the use of educational modules to assist medical students during clerkship rotations. A need for an online learning resource for the psychiatry core clerkship rotation was perceived by students and faculty in the Niagara Regional Campus (NRC) of McMaster University's Michael G. DeGroote School of Medicine.

**Objective**: To determine whether virtual Psychiatry modules would be beneficial to medical students entering their core psychiatry clerkship at McMaster University, Niagara Regional Campus.

**Methods**: An educational needs assessment was performed in March and April 2022 among all three classes of medical students. There was a 25% response rate from the surveyed students thus far, and the survey is still open to responses currently.

**Results**: The preliminary results showed that a barrier to students' confidence in psychiatry was the extensive time between their pre-clerkship MF4 psychiatry block and their clerkship psychiatry rotation. The perception is that little psychiatry-specific teaching is done during Integration Foundations and Transition to Clerkship. The areas where students felt most underprepared included understanding psychiatric medications and learning how to write consultation notes. Students expressed a need for additional study resources, notably introductory modules for the rotation and first-hand accounts from upper-year students on what to expect.

**Conclusion**: The development of educational modules for the psychiatry clerkship rotation at NRC will fill an unmet need to introduce clerks to relevant concepts in psychiatry before entering clinical settings. Medical clerks' satisfaction with, and perceived utility of, these modules will subsequently be assessed.

# COVID-19

# #P5 - Investigating COVID-19 vaccine communication and misinformation on TikTok: a cross sectional study

Katherine van Kampen *(1) and Jeremi Laski (2), MSc, Gabrielle Herman (1), and Teresa M. Chan (3), MD, MHPE

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton Ontario, Canada
(2) Central Michigan University College of Medicine, Mount Pleasant, Michigan, USA
(3) Department of Medicine at the Michael G. DeGroote School of Medicine and Continuing Professional Development, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada

**Purpose:** The COVID-19 pandemic has highlighted the need for reliable information, especially, around vaccines. Vaccine hesitancy is a growing concern and a great threat to broader public health. The prevalence of social media within our daily lives emphasizes the importance of accurately analyzing how health information is being disseminated to the public. TikTok is of particular interest as it is an emerging social media platform that young adults may be increasingly using to access health information.

**Methods:** The top 250 most viewed TikToks with the hashtag of #covidvaccine were batch downloaded on 01/07/2021 with their respective metadata. Each TikTok was subsequently viewed and encoded by two independent reviewers. Coding continued until 100 TikToks could be included based on language and content. Descriptive features were recorded including health care professional (HCP) status of creator, verification of health care provider status, genre and myths addressed. Primary inclusion criteria were any TikToks in English with discussion of a covid vaccine.

**Results:** Of the 102 videos included, the median number of plays was 1700000, with median shares of 9224 and followers 62200. Upon analysis, 14.7% of TikToks included HCPs (n=15) of which 80.0% (n=12) could be verified via social media or a google search. 100% of HCP TikToks supported vaccine use, and overall 81% of all TikToks (created by either a layperson or HCP) supported vaccine use.

**Conclusion:** As the pandemic continues, vaccine hesitancy poses a threat to lifting restrictions and discovering reasons for this hesitancy is important to public health measures. This study presents an opportunity to examine the discourse around the vaccine use on TikTok.

# #P6 - Hepatic sequelae of post-acute COVID-19 syndrome: A systematic review

Paul S. Mundra*(1). Zeena Kailani(2). Siwar Albashir(3).

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) Laurier University, Waterloo, Ontario; (3) Division of Gastroenterology, Department of Medicine, McMaster University, Hamilton, Ontario, Canada

**Background**: Persistent effects after acute COVID-19 infection is a phenomenon gaining increasing recognition. Post-acute COVID-19 syndrome, also known as long-COVID, is a syndrome characterized by persistent or delayed symptoms four weeks or beyond from initial infection onset. The long-term sequalae of COVID-19 infection on the liver remains unclear, as there is data describing both resolution and persistence of liver injury markers following infection recovery.

**Objectives**: The objective of this systematic review is to identify the prevalence of liver disease in patience with long-COVID, and to assess the current understanding of long-term hepatic sequalae in adults.

**Methods**: Inclusion criteria includes observational or cross-sectional studies with patients ⩾18y at least four weeks following COVID-19 infection evaluating liver disease/involvement, defined as per primary study. Exclusion criteria includes case reports or series, systematic reviews, literature reviews, meta-analyses, editorials and commentaries, or studies that report liver function/injury only during acute COVID-19 infection, rather than following. Systematic searches were performed on MEDLINE, CINAHL and EMBASE from 2019 to present. All studies will be screened by two reviewers, and conflicts will be resolved by a third reviewer. Risk of bias of all selected studies will be assessed. The findings yielded in the systematic review and potential meta-analysis will be reported in keeping with the recommendations of the PRISMA checklist. If there is sufficient high-quality data on prevalence, a meta-analysis will be conducted.

**Results**: 2733 studies were found and 614 duplicates were removed. 2119 abstracts and 37 subsequent full texts were screened. Relevant studies will be selected from the full texts. Demographic data and comorbidities of participants will be recorded. To assess liver function/injury, lab markers, imaging results, clinical findings of liver injury and need for transplantation or transplant rejection will be recorded.

**Discussion**: This review will summarize the current understanding of the hepatic sequalae of long-COVID.

# EMERGENCY MEDICINE

# #P7 - Improving care of children with autism and related neurodevelopmental disorders in Emergency Department settings: understanding the knowledge-to-practice continuum of ED providers (virtual poster)

**Devika Singh*(1)**, Julia Niro(2), James Leung(3), Mohammad Zubairi(4)

(1) Michael G. DeGroote School of Medicine, McMaster University; (2) Faculty of Science, McMaster University; (3) Division of Pediatric Emergency Medicine, Department of Pediatrics, McMaster Children's Hospital; (4) Division of Developmental Pediatrics, Department of Pediatrics, Ron Joyce Children's Health Centre

**Introduction**: Health professionals often report a lack of knowledge when caring for individuals with Autism Spectrum Disorder (ASD) and related Neurodevelopmental Disorders (NDD) in the emergency department (ED). The primary objective of this study is to understand the gaps in training and clinical exposure experienced by ED providers caring for children with ASD/NDD.

**Methods**: We conducted a mixed-methods study. In phase one, we surveyed an interprofessional team of tertiary care Pediatric ED providers on training experiences and gaps in managing children with ASD/NDD. These responses informed phase two, where we conducted semi-structured interviews that further explored gaps in training and care. These interviews were thematically analyzed to determine major objectives and aims of future educational interventions.

**Results**: 54/78 (69%) of eligible participants responded to the survey. Survey results showed 42.5% of ED providers had mandatory instruction on ASD/NDD during their training and 80% would value continuing training education on the topic. Notably, 41.2% of ED providers had prior personal experience with children with ASD/NDD, these experiences facilitated deeper understanding, communication, and awareness of system challenges. Eleven interviews were conducted that identified five themes: Understanding rationales for ED presentations given system challenges, provider knowledge gaps, management of behavioral escalations, communication barriers, and creating a sensory-friendly and positive environment.

**Conclusion**: ED providers require additional training to manage children with ASD/NDD. We identified five themes that future education interventions can address to better care for children with ASD/NDD in the ED.

# #P8 - Motorcycle Helmet Use Detection Using Machine Learning (virtual poster)

**Devika Singh\*(1)**, Orla A. Murphy(2), Hasan S. Merali(3)

(1) Michael G. DeGroote School of Medicine, McMaster University; (2) Department of Mathematics and Statistics, Dalhousie University; (3) Division of Pediatric Emergency Medicine, McMaster University

**Introduction**: Road traffic collisions are a leading cause of death worldwide with approximately 1.3 million deaths annually. In addition, up to 50 million people suffer non-fatal injuries. Half of all deaths are in vulnerable road users including motorcyclists. The best-known method to decrease injuries and deaths for motorcyclists is helmet use. Unfortunately, many countries have weak helmet laws and less than half of countries surveyed have data on helmet use. Current methods for measuring helmet use using police and hospital records, as well as roadside observation, are both expensive and time consuming. The purpose of this study is to evaluate the accuracy of machine learning in detecting motorcycle helmet use.

**Methods**: 1000 freely available online images (670 with a helmet, 330 without a helmet) were selected and resized for consistency. Each image had one person on a motorcycle either wearing or not wearing a helmet. The dataset was split into training data (used to train the classifiers with cross validation) and test data (used to evaluate the performance of the classifiers). The images were then classified and analyzed using two different methods: (i) extreme gradient boosting (XGBoost) and (ii) convolutional neural networks (CNNs) to determine helmet detection accuracy.

**Results**: Using a 50-50 split between helmeted and non-helmeted images, the highest accuracy of helmet detection was obtained using the XGBoost method at 67%. Increasing the number of images improved classification performance.

**Conclusion**: This pilot study demonstrates that machine learning can be an effective method of helmet use detection, although further research is needed with larger datasets to improve accuracy. If successful, this methodology could be applied to traffic cameras and provide a less costly and faster method for detecting helmet use. This has the potential to assist authorities with helmet legislation and enforcement.

# #P9 - Testing the triaged game: engagement level, acceptability, and applicability of a serious board game for teaching and learning

Naman Arora (1), **Reva Qiu\*** (1), Sasha Palmert (1), Paula Sneath (1), Kevin Morgan (2), Mark Cicero (3), Teresa Chan (1), and Clare Wallner (1)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) Centre for Paramedic Education & Research (CPER), Hamilton, Ontario, Canada; (3) Yale School of Medicine, Yale University, New Haven, Connecticut, USA

**Introduction**: Mass Casualty Incidents (MCIs) are, thankfully, rare in healthcare. Thus, it can be difficult to fully understand MCI triage and management. Didactic teaching cannot effectively portray the complexities of MCIs and large-scale simulations are costly. With rising interest in simulation-based learning, we believe that MCI management foundations can be effectively learned through serious games. Thus, we developed "TriagED", a serious board game where players work cooperatively to manage simulated MCIs. As a relatively new method of teaching, there is a paucity of evidence evaluating the effectiveness of educational games as teaching tools. However, subjective feedback from learners almost universally supports educational games over traditional didactic teaching, with studies showing higher engagement and reduced burnout.

**Objective**: examine the engagement level, usability, perceived fidelity, acceptability, and anticipated applicability of a serious board game for teaching andlearning emergency department flow concepts in MCI scenarios.

**Methods**: a two-phase observation mixed-methods study will be conducted to examine how participants engage with "TriagED" as an adjunct to teaching about MCIs. Participants will be randomized into a control arm where they will watch an MCI management lecture, or the gameplay arm where they will play "TriagED". All participants will complete pre- and post-intervention surveys with objective knowledge assessment and subjective experience assessment to evaluate applicability, feasibility, engagement, and acceptability of "TriagED".

**Results/conclusion**: while this study is currently in progress, this lab previously developed "GridlockED", an educational board game that effectively taught learners how to manage multi-patient environments. Utilizing a similar development process, "TriagED" was created to teach trainees about patient triage and flow in MCIs. The primary outcome is assessing the applicability of "TriagED" in teaching MCI management. The secondary outcome involves determining the knowledge, engagement levels, and acceptability of "TriagED" in teaching MCI management.

# CARDIOVASCULAR HEALTH

## #P10 - Stenting and angioplasty of the superficial femoral artery: a single institution retrospective analysis

**Nikhil Nair Hariharan\*** (1), Jacob Alaichi (2)(3), John Harlock (4), Faysal Naji (4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada
(2) Faculty of Health Sciences, McMaster University, Hamilton, ON, Canada
(3) Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, ON, Canada
(4) Department of Vascular Surgery, Hamilton Health Sciences, Hamilton, ON, Canada

**Introduction/Objective:** This study evaluated the short- and long-term efficacy outcomes of percutaneous transluminal angioplasty alone (PTA) or with stenting (PTAS) for the management of peripheral artery disease (PAD) of the superficial femoral artery (SFA) vessels.

**Methods**: All patients with PAD of the SFA vessels admitted between 2015-2019 at the Hamilton General Hospital who underwent PTA or PTAS were reviewed. The primary outcome was the primary patency rate, defined as the length of time the patency is maintained before any recurrent stenosis or repeated interventions. Additionally, patient demographics and existing comorbidities were extracted at the 1-month, 3-month and 6-month intervals using standardized forms. Descriptive statistics were used to report results.

**Results**: 71 patients were included with 14 PTA patients and 57 PTAS patients. The mean primary patency was 1.46 years across all patients, with a mean follow-up time of 1.84 years. Pooled primary patency rates were 89% at 3 months, 75% at 6 months, 58% at 12 months and 31% at 24 months. In the PTA group, primary patency rates were 100% at 3 months, 71% at 6 months, 50% at 12 months and 22% at 24 months. Comparatively, primary patency rates were 86% at 3 months, 75% at 6 months, 60% at 12 months and 33% at 24 months in the PTAS group. There was no significant association between comorbidities and primary patency ($p > 0.01$ for each covariate coefficient).

**Conclusions**: PTA is effective for PAD patients. Stenting notably improved long-term primary patency rates in patients with PAD of the SFA vessels.

# #P11 - Techniques to improve the success of electrical cardioversion for patients with atrial fibrillation: A systematic review and meta-analysis

Stephanie T. Nguyen*(1,2), Emilie P. Belley-Côté(1,2), Omar Ibrahim(1,2), Kevin J. Um(1,2), Alexandra Lengyel(1,2), Taranah Adli(2), Michael Wong(1,2), Yuan Qiu(1,2), Serena Sibilio(1,2), Alexander Benz(2), Alex Wolf(2), Nicola Whitlock(2), J. Gabriel Acosta(1,2), Jeff S. Healey(1,2), Adrian Baranchuk(3), William F. McIntyre(1,2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) Population Health Research Institute, McMaster University, Hamilton, Ontario, Canada ; (3) Queen's University, Kingston, Ontario, Canada

**Background**: Electrical cardioversion is commonly used to treat patients with atrial fibrillation (AF). Procedural technique and clinical success, however, vary.

**Objective**: To identify different techniques associated with electrical cardioversion success for patients with atrial fibrillation.

**Methods**: We searched CENTRAL, Medline and EMBASE from inception to December 2021 along with the grey literature. We included randomized controlled trials comparing any two techniques. Two reviewers collected study data and assessed the risk of bias of each study independently and in duplicate. Primary outcomes were initial and cumulative cardioversion success. We pooled data using random effects models and rated the quality of evidence using the GRADE approach.

**Results**: From 13,481 citations, we identified 48 randomized trials. Biphasic as compared to monophasic waveforms resulted in a higher rate of initial (16 trials, RR 1.71, 95%CI 1.29-2.28) and cumulative success (19 trials, RR 1.10, 95%CI 1.04-1.16). Fixed, maximum-energy shocks as compared to escalating energy resulted in a higher likelihood of initial success (4 trials, RR 1.62, 95%CI 1.33-1.98). Manual pressure as compared to none resulted in a higher rate of initial (2 trials, RR 2.19, 95%CI 1.21-3.95) and cumulative success (2 trials, RR 1.19, 95%CI 1.06-1.34). Cardioversion success did not differ significantly for other interventions, including: antero-apical/lateral vs. antero-posterior positioned pads (initial: 11 trials, RR 1.17, 95%CI 0.99-1.38; cumulative: 14 trials, RR 1.01, 95%CI 0.96-1.06); rectilinear/pulsed biphasic vs. biphasic truncated exponential waveform (initial: 4 trials, RR 1.11, 95%CI 0.91-1.34; cumulative: 4 trials, RR 0.98, 95%CI 0.89-1.08); cathodal vs. anodal configuration (cumulative: 2 trials, RR 0.99, 95%CI 0.92-1.07); and magnesium pre-treatment (initial: 2 trials, RR 1.34, 95%CI 0.79-2.27; cumulative: 2 trials, RR 1.06, 95%CI 0.95-1.19).

**Conclusions**: Biphasic shock waveforms, high-energy shocks, and manual pressure increase the acute success of electrical cardioversion for AF. Other interventions, including pad placement, require further study.

# #P12 - Reappraisal of reported genes for lipodystrophy disorders

Geoff Elder*(1), Ricky Lali(2), Nazia Pathan (2), Marie Pigeyre(3), Guillaume Pare(3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) Department of Biochemistry and Biomedical Sciences, McMaster University, Hamilton, Ontario, Canada; (3) Population Health Research Institute, David Braley Cardiac, Vascular and Stroke Research Institute, Thrombosis and Atherosclerosis Research Institute, Hamilton Health Sciences, Ontario, Canada

**Background**: Lipodystrophy is a group of rare genetic disorders characterized by a lack of subcutaneous adipose tissue, and a compensatory increase in visceral fat that causing hypertriglyceridemia, insulin resistance, and diabetes. Estimated prevalence of lipodystrophy syndromes is 1per million. This rarity has limited genetic studies from demonstrating causation. Over 50 genes have been associated with lipodystrophy and 29 are part of clinical genetic panels. Here, we focus on the 10 genes associated with non-acquired non-syndromic lipodystrophies. Four of these are purportedly causative of congenital lipodystrophy – AGPAT2, BSCL2, PTRF/CAVIN1 and CAV1. The others (PPARG, LMNA, PLIN1, AKT2, LIPE, CIDEC) are related to partial lipodystrophy.

**Objective**: Whether these genetic variants are pathogenic is questionable. Given the recent progress in methodology to analyze rare genetic variants, and the increasing availability of large databases, we propose to revisit the pathogenicity of identified genetic variations.

**Methods**: Following the ClinGen Gene Curation standards of practice, the level of evidence for 10 genes was assessed based on literature review. We will leverage the 200,000+ exomes and phenotypes in the UK Biobank (UKB) to test whether identified rare variants are causative. UKB participants will be divided into 2 groups based on a presence of a lipodystrophy diagnosis or phenotype (triglycerides above the 85th percentile, peripheral fat mass below the 15th percentile). Using a candidate gene approach, variants will be tested for differences in frequency between these 2 groups.

**Results to Date:** Literature review of 7 genes has been completed. 4 genes had strong evidence of association (AGPAT2, BSCL2, CAVIN1, LIPE). 2 genes had limited evidence (AKT2, CIDEC). One gene was found to have contradictory evidence (CAV1).

**Conclusions**: We intend to determine the validity of the inclusion of these genes in the genetic panels used in clinical practice.

# #P13 - Pre-participation withdrawal and non-Completion of cardiac rehabilitation in peripheral artery disease: matched comparisons to coronary artery disease

**Cindy H. Nguyen*** (1,2) and Susan Marzolini (2,3,4)

(1) Michael DeGroote School of Medicine, McMaster University – Niagara Regional Campus, St. Catharines, Canada; (2) KITE Research Institute, Toronto Rehabilitation Institute – University Health Network, Toronto, Canada; (3) Department of Exercise Sciences, Faculty of Kinesiology and Physical Education, University of Toronto, Toronto, Canada; (4) Rehabilitation Sciences Institute, Temerty Faculty of Medicine, University of Toronto, Toronto, Canada

**Background**: Patients with peripheral artery disease (PAD) are less likely to start and complete cardiac rehabilitation (CR) than patients with coronary artery disease (CAD). This may be due to PAD itself and/or the more complex risk factor profile.

**Purpose**: To compare CR pre-participation withdrawal (referred but did not start) and non-completion between patients with PAD and concomitant PAD and CAD (PAD/CAD) matched to CAD and a group of unmatched CAD (uCAD).

**Methods**: Consecutively referred patients with PAD (n=271) and PAD/CAD (n=610) were matched to CAD by age, sex, diabetes diagnosis, smoking status when available, and referral year from database records (2006 to 2017). uCAD patients (n=14,487) were included for reference. Reasons for withdrawal (medical/non-medical) were ascertained by interview.

**Results**: There were no significant differences in pre-participation withdrawal between PAD and matched CAD (46.1% vs. 43.2%;P=.49) nor in non-completion (21.8% vs. 18%;P=.28). Results were similar for PAD/CAD vs. matched CAD (pre-participation withdrawal: 36.2% vs. 33.8%;P=.37 and non-completion: 24.8% vs. 23%;P=.46). Comparisons to uCAD for pre-participation withdrawals show a smaller proportion (28.3%) compared to PAD (P<.001) and PAD/CAD (P<.001) but no difference in non-completion (23.4%;P>.40, both). There were no differences between PAD and PAD/CAD with matched counterparts for medical and non-medical reasons for pre-participation withdrawal and non-completion (P>.20, all). Session attendance was similar between all cohorts (P>.30).

**Conclusion**: Pre-participation withdrawal rates were similar between PAD and PAD/CAD with their matched CAD cohorts, but greater compared to uCAD. For patients that started CR, there were similar completion rates among all groups. Reports that patients with PAD are less likely to start CR may be related to the complex medical profile rather than PAD alone. Strategies to improve participation should focus on the immediate post-referral period for patients with PAD, PAD/CAD, as well as those with a diagnosis of CAD with a similar profile.

# #P14 - LPS-induced systemic inflammation exacerbates CNS ischemia-reperfusion injury after tMCAO (virtual poster)

Eleanor R. Lena*(1), Sarah Knowlden (2), Yinghui Li (4), Landa Prifti (3), George Albert (4), and Marc W. Halterman (4)

(1) Temerty School of Medicine, University of Toronto, Toronto, ON, CA
(2) Department of Microbiology & Immunology, University of Rochester, Rochester, NY, USA
(3) Department of Neuroscience, University of Rochester, Rochester, NY, USA
(4) Department of Neurology, Stony Brook University, Stony Brook, NY, USA

BACKGROUND: Systemic inflammation (SI) is an established risk factor for stroke and a predictor of stroke severity. However, with the exception of anti-platelet agents, interventions to limit post-stroke inflammation are limited. Models incorporating SI among other clinically relevant stroke modifiers are needed to prioritize candidate therapies for acute ischemic stroke.

OBJECTIVE: To characterize the effects of mild systemic inflammation (SI) on cerebral injury, immune cell activation, and vascular damage in a mouse model of transient middle cerebral artery occlusion (tMCAO).

METHODS: Wild-type C57BL6/J male mice (25-30g) were randomized to 3 treatment groups (nSHAM=8, nMCAO+SAL=9, nMCAO+LPS=8). MCAO+SAL and MCAO+LPS groups were subject to 40-min tMCAO. To model mild SI, mice received a single i.p injection of bacterial lipopolysaccharide (LPS) one-hour post-reperfusion. Three days later, mice were sacrificed, and brains were imaged, sectioned, stained using TTC, and homogenized for immunoblotting. Markers denoting neuronal injury (NeuN and Cleaved PARP), inflammation (IBA-1 and Ly6G), and vascular leak (Claudin-5 and Fibrinogen) were assessed across the A-P dimension.

RESULTS: Compared to the tMCAO/SAL cohort, tMCAO/LPS mice exhibited increased core stroke volumes and post-ischemic hemorrhagic transformation. LPS administration was also associated with heightened peripheral immune activation and vascular injury in the ipsilateral hemisphere, thus demonstrating the utility of the LPS-MCAO model in isolating responses to transient ischemia consistent with the established core vs.penumbra model.

CONCLUSIONS: Systemic inflammatory challenge induces spatial variation in ischemic injury and hemorrhagic transformation. Our study suggests that this model may serve as an effective platform to test therapeutic agents targeting neurovascular-immune interactions in the post-stroke period.

# INTERNAL MEDICINE

36
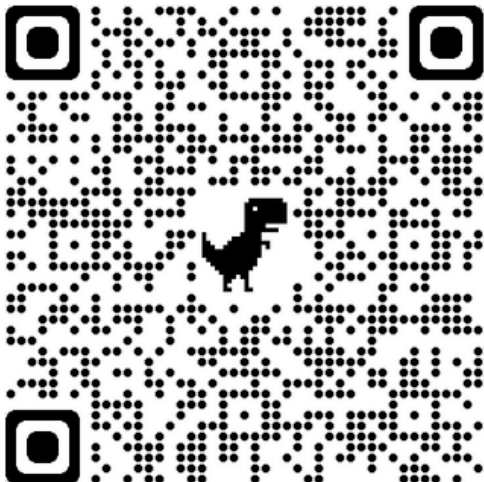
# #P15 - Negative pressure incisional wound therapy for high-risk ventral hernia repair: a randomized controlled trial.

Christopher Blewett(1), Nathan How (2), Yazan Abu Yousef (3), **Jade Chow***(4), Fayyaz Rizvi (5)

(1) Department of General Surgery, McMaster University, Niagara, Ontario, Canada; (2) Department of General Surgery, McMaster University, Niagara, Ontario, Canada; (3) McMaster Medical Student, McMaster University, Niagara, Ontario, Canada; (4) McMaster Medical Student, McMaster University, Niagara, Ontario, Canada; (5) McMaster Medical Student, McMaster University, Niagara, Ontario, Canada;

**Background**: Ventral hernia repairs are one of the most common surgeries performed by general surgeons, and are frequently plagued by surgical site complications due to the many risk factors which are common for development of the hernia in the first place. Despite advances in both surgical techniques and adoption of new prosthetic material alike, wound-related complications remain a primary determinant of postoperative morbidity. Negative pressure wound therapy has become a popular prophylaxis of wound complications due to its direct and indirect effects such as reduction of wound edema, promotion of micro vessel maturation, reduction in bacterial burden, amongst many others.

**Methods**: The study is a multicenter, open-label, randomized active-controlled trial evaluating the superiority of negative pressure incisional wound therapy in two parallel intervention groups. 110 patients with at least two comorbidities from both the St. Catharine's General Hospital and the Greater Niagara General Hospital will be randomly assigned to either receive a PREVENA negative pressure dressing for 7 days post-operatively or a standard sterile dressing for 2 days post-operatively with a primary objective to evaluate the impact of negative pressure incisional wound therapy in surgical repair of high-risk ventral hernias on post-operative surgical site complications. The secondary outcome is a 3-month postoperative score on the Hernia-related quality of life (HerQLes) questionnaire. The study is open with 42 patients enrolled at time of submission.

# #P16 - Values and preferences towards antithrombotic therapy in patients with myeloproliferative neoplasms: A Qualitative Study

**Jonah Rakoff*** (1), Shannon Lane (2), Deborah Siegal (3), Christopher Hillis (4)

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

**Background**: Philadelphia chromosome-negative myeloproliferative neoplasms (MPNs), including polycythemia vera and essential thrombocythemia, result in an increased risk of both thrombosis and major bleeding. Thromboprophylaxis is recommended but also further increases the risk of bleeding and there remains uncertainty regarding the net clinical benefit. When deciding to use antithrombotic therapy, physicians must understand how patients perceive their own risk of thrombosis and bleeding and the consequences of these events. The objectives of this study were to identify factors that are important to patients with MPNs regarding antithrombotic therapy and to identify barriers and facilitators of antithrombotic therapy.

**Methods**: This was a qualitative study that utilized focus group discussions (FGDs) with open-ended questions and a voting exercise. Participants were recruited using an advertisement that was circulated through MPN Patient Support Groups throughout Canada. FGDs were stratified based on previous history of a bleeding event, previous history of a thrombotic event, and no previous history of a bleed or clot. Qualitative data was analyzed using the Framework Method, whereby transcripts were reviewed and coded based on the research objectives.

**Results**: We recruited 19 participants and conducted four FGDs. We identified 13 facilitators for taking blood thinners: preventing clots, prolonging life, peace of mind, preventing headaches, cheap and accessible, common medication, other patients with MPNs taking them, doctor's recommendation, easy to take, effective, fewer side effects than other medications, maintaining health, minimal risk, no choice, and no perceived downsides. We identified 5 barriers to taking blood thinners: bruising, bleeding, longer time for healing, medication burden, and stomach issues. The most important factors to patients were doctor's recommendation and preventing clots.

**Conclusion**: Patients with MPNs are very agreeable to taking blood thinners when recommended by their hematologist and place more emphasis on preventing clots than the risk of bleeding.

# #P17 - Tubulovillous villous adenoma with coexistent adenocarcinoma in the female urethra: a case report and review of the literature

**Kikachukwu Otiono*** (1), Abdullah A. Alrumaih (2), Harkanwal Randhawa (2), Edward D. Matsumoto (2)
(1) Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada
(2) Division of Urology, Department of Surgery, McMaster University, Hamilton, Ontario, Canada

**Introduction/Background:** Villous adenomas in the urinary tract are a well-recognized but uncommon clinical entity with unclear malignant potential. Here, we present the case of a 66-year-old woman with gross hematuria, urinary retention, and a bladder neck mass that was identified as intestinal-type tubulovillous adenoma with coexistent adenocarcinoma. Even in the sparse literature on this disease, it is exceedingly rare to find cases involving (1) tubulovillous adenomas; (2) adenomas in the female urethra or urethral diverticula; and (2) concurrent adenocarcinoma. To our knowledge, this is the first case in English literature of tubulovillous adenoma with invasive adenocarcinoma found in a urethral diverticulum. We also include a review of the literature on villous adenoma in the female urethra.

**Case Report/Results:** A 66-year-old woman presented to the urology clinic with gross hematuria and urinary retention requiring catheterization. Physical examination, urine culture & cytology, and colonoscopy were unremarkable. CT revealed a polypoid mass along the bladder neck, measuring 3.4cm. Primary histopathological analysis of the specimen after transurethral resection showed tubulovillous adenoma. Repeat resection and pathology confirmed tubulovillous adenoma as well as coexistent invasive adenocarcinoma. The patient underwent cystourethrectomy and pelvic exenteration.

**Methods**: We completed a review of the literature on villous adenoma in the female urethra using PubMed and EMBASE. The keywords used were urethra OR female urethra OR urethral AND villous adenoma and only articles in English were included – 10 case reports from 1981 to 2021 were found.

**Discussion**: Cases of urinary tract villous adenoma coexistent with adenocarcinoma are uncommon but provide insight into future treatment plans and considerations. Of note, adenomas in the gastrointestinal tract are known to undergo a malignant transformation into carcinoma in situ and invasive carcinoma secondary to chronic metaplasia and high-grade dysplasia. Our case, among others, suggests that genitourinary villous adenoma may undergo a similar transformation from adenoma to adenocarcinoma. In our case, even after extensive treatment with cystourethrectomy and pelvic exenteration, post-operative pathology showed remnants of adenoma and adenocarcinoma. This reinforces previous assertions that patients presenting with concurrent villous adenoma and adenocarcinoma require aggressive treatment. However, given the rarity of the disease, implementing specific treatment plans and evaluating prognosis continues to pose a challenge for clinicians.

**Conclusion**: Villous adenoma in the urinary tract is an uncommon disease but remains an important differential diagnosis for the urologist. In patients that undergo surgical resection for isolated villous adenoma, the prognosis is generally excellent. However, patients with coexistent adenocarcinoma are at a higher risk of recurrence or distance metastases and may benefit from more aggressive biopsy sampling and treatment.

# #P18 - Systematic review and meta-analysis of racial and ethnic disparities in disease-related outcomes in patients with Systemic Lupus Erythematosus: preliminary results

**Keerthana Pasumarthi***(1), Teresa Semalulu(2), Kevin Zhao(1), Rauda AlDhaheri(2), Nadine Akbar(3), Karen Beattie(2), Konstantinos Tselios(2)
(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario;
(2) Department of Medicine, McMaster University, Hamilton, Ontario;
(3) University of Toronto, Toronto, Ontario

**Background**: Systemic lupus erythematosus (SLE) is a chronic, multi-systemic autoimmune disease with a heterogenous presentation. Racialized patients and ethnic minorities with SLE are more likely to have poor outcomes due to a complex interplay between genetic and environmental factors. While racial and ethnic disparities in SLE outcomes are well known, a comprehensive review of disease-related outcomes has not been done.

**Objective**: To conduct a systematic review examining racial and ethnic disparities in mortality, end-stage renal disease (ESRD), disease-related damage, cardiovascular disease (CVD), malignancy, and hospital utilization, among adults with SLE.

**Methods**: A systematic search of OVID Embase, OVID MEDLINE, and Web of Science was conducted, using PRISMA guidelines. Search terms included various combinations of keywords to identify studies with the population (e.g., SLE, Asian, Black, Indigenous, White, Hispanic, Arab) and disease-related outcomes of interest. Cohort studies were selected if they reported race-based data and provided ⩾two years of longitudinal data. To date, reviewers have screened titles, abstracts, and full text articles for inclusion. Data will be extracted for meta-analysis and risk of bias assessments.

**Preliminary Result**s: A total of 5,541 studies underwent title and abstract screening, of which 245 underwent full-text review. Among 15 studies selected for inclusion to date, racial and ethnic minorities reported worse outcomes in mortality (n=5), ESRD (n=4), damage accrual (n=3), CVD (n=2), malignancy (n=2), and healthcare utilization (n=2). Compared to white patients, most studies (n=14) identified disparities in disease-related outcomes among Black SLE patients, followed by Asian (n=10) and Hispanic patients (n=8). Nine studies were conducted in North America, three in Europe, two in Africa and one in Australia.

**Conclusion**: Preliminary results identified racial and ethnic disparities in disease-related outcomes among Black, Asian, and Hispanic people with SLE. Synthesizing these data will inform future practice and research, ultimately aiming to reduce the impact of race and ethnicity on poor disease-related outcomes.

# #P19 - A case of hCG-related thyrotoxicosis: could this be a thyroid storm?

**Jennifer E. Butler**\*(1), Dr. Mohamed Hussein (2), and Dr. Natalia McInnes (2)

(1) Department of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) Department of Medicine, Division of Endocrinology, McMaster University, Hamilton, Ontario, Canada

Thyrotoxicosis has many etiologies including thyroiditis, Graves disease, and high levels of hCG. Here we present a case of a 19-year-old male with a history of non-germinomatous germ cell tumor. He was initially treated with chemotherapy followed by tumor resection which removed 80-90% of the tumor. One month later, he presented to hospital with new headache, nausea, and tachycardia. His thyroid uptake and scan were suggestive of hyperthyroidism which was thought to be secondary to hCG stimulation. He was started on methimazole and discharged. Ten days later, he was admitted to hospital again with symptoms including worsening headache, lethargy, tachycardia, mild CNS agitation, fever and jaundice and his Burch-Wartofsky score was 55. On admission, his AST and ALT values were 155 U/L and 224 U/L respectively, whereas total hCG levels were above 1,000,000 IU/L. His presentation with hyperthyroidism and liver dysfunction was thought to be related to high hCG levels and underlying metastatic disease. However, since thyroid storm could not be ruled out, the patient was managed with propylthiouracil, Lugol iodine drops and dexamethasone. The methimazole was discontinued. On day 3 of admission, propylthiouracil was stopped due to increasing bilirubin and liver enzymes. By day 5 of admission, AST and ALT levels reached 1623 U/L and 2583 U/L. The team discussed whether to pursue radioactive iodine ablation for managing the hyperthyroidism, as opposed to giving further methimazole or propylthiouracil given elevated liver enzymes. Unfortunately, after 10 days of admission, the patient passed away from multi-organ failure. This case demonstrates the difficulties in making the diagnosis of a thyroid storm in a setting of a complex medical presentation and deciding on the appropriate management.

# #P20 - Allergen immunotherapy for atopic dermatitis: a systematic review and meta-analysis of benefits and harms

Juan José Yepes-Nuñez (1), Gordon H. Guyatt (2), Luis Guillermo Gómez-Escobar (3), Lucia C. Pérez-Herrera (1,4), Alexandro Chu (5), Renata Ceccacci* (6), Ana Sofía Acosta-Madiedo (7), Aaron Wen (5), Sergio Moreno-López (1,4), Margaret MacDonald (6), Mónica Barrios (1), Xiajing Chu (8), Nazmul Islam (9), Ya Gao (2), Melanie Wong (6), Simon Gaviria-Valencia (10), Hansel Ochoa-Montero (1), Sebastian Gutierrez-Romero (1), Rachel Couban (2), Paul Oykhman (11), Lina Chen (12), Tonya Winders (13), Rachel Asiniwasis (14), Mark Boguniewicz (15), Anna DeBenedetto (16), Kathy Ellison (17), Winnifred Frazier (18), Matthew Greenhawt (19), Joey Huynh (20), Elaine Kim (21), Jennifer LeBovidge (22), Mary Laura Lind (23), Peter Lio (24), Stephen Martin (25), Monica O'Brien (26), Peck Ong (27), Jonathan Silverberg (28), Jonathan Spergel (29), Julie Wang (30), Kathryn Wheeler (31), Lynda Schneider (22), Derek K. Chu (2,11,32)

(1) School of Medicine, Universidad de los Andes, Bogotá, Cundinamarca, Colombia; (2) Department of Health Research Methods, Evidence, and Impact, McMaster University, Hamilton, Ontario, Canada; (3) Division of Pulmonary and Critical Care, Department of Medicine, Weill Cornell Medicine, New York City, New York, United States of America; (4) Unidad Médico Quirúrgica de Otorrinolaringología, Bogotá, D.C., Colombia; (5) Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada; (6) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (7) School of Medicine, Universidad del Norte, Barranquilla, Atlántico, Colombia; (8) School of Public Health, Lanzhou University, Lanzhou, Gansu, China; (9) Department of Public Health, College of Health Sciences, Qatar University, Doha, Qatar; (10) School of Medicine, Universidad CES, Medellín, Antioquia, Colombia; (11) Division of Clinical Immunology and Allergy, Department of Medicine, McMaster University, Hamilton, Ontario, Canada; (12) University of Ottawa, Ottawa, Ontario, Canada; (13) Allergy and Asthma Network, Vienna, Virginia, United States of America; (14) Origins Dermatology Centre, University of Saskatchewan, Regina, Saskatchewan, Canada; (15) National Jewish Health, Denver, Colorado, United States of America; (16) University of Rochester Medical Center, Rochester, New York, United States of America; (17) Westerville, Ohio, United States of America; (18) Department of Family Medicine, UPMC St. Margaret, Pittsburgh, Pennsylvania, United States of America; (19) Section of Allergy and Immunology, Children's Hospital Colorado, Department of Pediatrics, University of Colorado School of Medicine, Aurora, Colorado, United States of America; (20) Orthopedic Neurological Rehabilitation, Northridge, California, United States of America; (21) Registered pharmacist, Toronto, Ontario, Canada; (22) Division of Immunology, Boston Children's Hospital, Boston, Massachusetts, United States of America; (23) School for Engineering of Matter, Transport and Energy, Arizona State University, Tempe, Arizona, United States of America; (24) Feinberg School of Medicine, Northwestern University, Chicago, Illinois, United States of America; (25) Department of Family Medicine and Community Health, UMass Chan Medical School, Worcester, Massachusetts, United States of America; (26) School of Medicine, Tufts University, Boston, Massachusetts, United States of America; (27) USC Keck School of Medicine, Children's Hospital Los Angeles, Los Angeles, California, United States of America; (28) Department of Dermatology, the George Washington University School of Medicine and Health Sciences, Washington, D.C., United States of America; (29) Department of Pediatrics, Perelman School of Medicine, University of Pennsylvania and Children's Hospital of Philadelphia, Philadelphia, Pennsylvania, United States of America; (30) Icahn School of Medicine, Mount Sinai, New York City, New York, United States of America; (31) Department of Pediatrics, University of Florida, Gainesville, Florida, United States of America; (32) The Research Institute of St. Joe's Hamilton, Hamilton, Ontario, Canada

**Background**: The pathogenesis of atopic dermatitis (AD) is thought to involve both skin barrier dysfunction and extrinsic stimuli such as allergens, microbes, and irritants. The exact role of allergens in the pathogenesis has not yet been elucidated.

**Objective**: To determine the efficacy and safety of allergen immunotherapy (AIT) in treating atopic dermatitis.

**Methods**: MEDLINE, EMBASE, CENTRAL, CINAHL, and LILACS databases were searched up until December 2021 for randomized controlled trials (RCTs) that compared subcutaneous immunotherapy (SCIT), sublingual immunotherapy (SLIT), and/or no AIT (placebo or standard of care) to qualify outcomes that included eczema severity, itch, eczema-related quality of life (QoL), flares, and adverse events. Each study was screened, extracted, and evaluated for risk of bias in duplicate by independent raters.

**Results**: 23 RCTs, encompassing 1957 patients, were included in the analysis. Results showed an improvement in eczema severity, defined as a 50% reduction in the SCOring Atopic Dermatitis score, in 40% of patients with AIT versus 26% without (RR 1.53 [95%CI 1.31-1.78]) and an improvement in QoL, defined as an improvement in the Dermatology Life Quality Index by 4 points or more, in 56% of those with AIT compared to 39% without (RR 1.44 [95%CI 1.03-2.0]). AIT also improves itch by 50% or more, shown in 25% with AIT versus 19% without. Increased adverse events were seen in those treated with AIT (59% with SCIT versus 41% with placebo and 10% with SLIT versus 7% with placebo). The effect of AIT on sleep disturbance and AD flares was unable to be ascertained.

**Conclusion**: These findings show that AIT improves eczema severity and QoL while also increasing minor adverse events. Allergens, with house dust mite allergens being the most well studied, may be an important therapeutic target in the management in AD.

# BRAIN & BEHAVIOUR

# #P21 - Structural Stigma and Inpatient Care for People who Inject Drugs

**Maham Rehman\*** (1)(a) Leigh Chapman (2), Lisa Liu (3), Sara Calvert (1)(b) and Javeed Sukhera (3)(c)

(1) Department of Psychiatry, Schulich School of Medicine and Dentistry, Western University, London, Canada
(2) Inner City Health Associates, Toronto, Canada
(3) Centre for Education Research and Innovation, Schulich School of Medicine and Dentistry, Western University, London, Canada
Present Address:
(a)McMaster University, Michael DeGroote School of Medicine, Hamilton, Ontario, Canada
(b)Northern Ontario School of Medicine, Sudbury, Ontario, Canada
(c)Institute of Living and Hartford Hospital, Institute of Living Terry Building
200 Retreat Avenue, Hartford Connecticut, United States of America

**Introduction**: Individuals suffering with addiction have historically experienced disproportionally high levels of stigma and health inequities. The process of inpatient care for people with substance abuse disorder (SUD) is complex and is influenced by both human interactions between a patient and healthcare team and structural components, both at the level of the organization.

**Objectives**: Structural forms of stigma may influence how care is enacted in practice. In this study, we sought to analyze care processes for people with SUD admitted to acute medicine units.

**Methods**: We conducted a secondary analysis of observation notes and interview transcripts utilizing an analytic framework related to structural stigma adapted from previous research. Data was collected from June 2019 to January 2020 in 2 hospitals. 81 participants consented to observation and 12 to interviews.

**Results**: Each aspect of care for people with SUD is adversely influenced by structural forms of stigma. There was evidence of a gap in accessing care and time pressures which contributed to further deterioration in care processes. Structural stigma was also manifested in the physical spaces designed for care and the lack of adequate resources of mental health and addictions care. Structural stigma further perpetuated other forms of implicit and explicit stigma.

**Conclusions**: Structural stigma and other forms of stigma are interconnected. Improving care for people with SUD in hospital settings may require addressing structural forms of stigma such as how physical spaces are designed and how mental healthcare is integrated with physical healthcare within inpatient settings.

## #P22 - Prevalence of anxiety and depression in treated head and neck cancer patients and usage of prescription medications and marijuana

Shahzaib Khattak*(1), Jakob Pugi(2), Michael K. Gupta(2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada ;
(2) Division of Otolaryngology - Head and Neck Surgery, McMaster University, Hamilton, Ontario, Canada

**Introduction**: Given the functional impairment and cosmetic changes resulting from head and neck cancer (HNC) and subsequent treatments along with high anxiety and depression rates in HNC patients, there is a role for exploring novel treatments like medical marijuana that can effectively address mood and QOL impairments.

**Objectives**: To determine the prevalence of anxiety and depression symptoms in treated HNC patients and explore relationships between medication use, marijuana use and anxiety and depression symptoms.

**Methods**: Fifty-four adult patients who were a minimum of 3 months post-treatment for a mucosal HNC or salivary gland cancer were surveyed at a tertiary academic cancer centre between July and September 2021. The survey included questions regarding demographics, medication and alcohol use, marijuana use, and the GAD-7 and PHQ-9 questionnaires. Cancer diagnosis and treatment information were obtained from electronic medical records with consent.

**Results**: 37 patients were male and 17 were female and the mean (SD) age was 65.9 (9.5) years. The mean (SD) GAD-7 score for the population (N=53) was 3.62 (4.18) and for patients on anxiolytics (n=4) the mean (SD) score was 4.25 (4.92). Mean (SD) PHQ-9 score for the population (N=53) was 4.86 (5.51) and for patients on antidepressants (n=7) the mean (SD) score was 9.36 (7.99). Wilcoxon rank sum tests with continuity correction showed statistically significantly higher GAD-7 and PHQ-9 scores for HNC patients using marijuana compared to non-users ($p = 0.04864$ and $p = 0.04067$ respectively).

**Conclusions**: The results suggest that marijuana use is associated with an increase in anxiety and depression symptoms in HNC patients. Mean HNC patient GAD-7 scores were higher than those of the general population. Mean PHQ-9 scores were lower than expected based on literature, but higher than the general population mean.

# #P23 - Characterizing Problematic Internet Use in a Sample of Heavy Drinking Emerging Adults

Angad Singh*(1), Emily Levitt (2), Noam Soreni (3,4,5), Michael Van Ameringen (5,6,7), James MacKillop (2,8)

1) Michael G. DeGroote School of Medicine, Hamilton, Ontario, Canada; (2) Peter Boris Centre for Addictions Research, McMaster University & St. Joseph's Healthcare Hamilton, Hamilton, Ontario, Canada; (3) Offord Centre for Child Studies, McMaster University, Chedoke Site, Hamilton, Ontario, Canada; (4) Anxiety Treatment and Research Centre, St. Joseph's Healthcare, Hamilton, Ontario, Canada; (5) Department of Psychiatry and Behavioral Neurosciences, McMaster University, Hamilton, Ontario, Canada; (6) MacAnxiety Research Centre, McMaster University, Hamilton, Ontario, Canada; (7) Hamilton Health Sciences, Hamilton, Ontario, Canada; (8) Homewood Research Institute, Guelph, Ontario, Canada

**Background**: Problematic Internet use (PIU) is characterized by excessive or poorly controlled preoccupations, urges, or behaviours regarding Internet use resulting in impairment or distress. PIU is most prevalent during emerging adulthood, a period marked by an increase in psychiatric disorders, including substance use disorders (SUD). However, few studies have characterized PIU in terms of its impact on various domains of functioning.

**Objective**: The aim of the study is therefore threefold: to explore the relationship between PIU and (i) QoL, (ii) psychiatric disorders; and (iii) impulsivity.

**Methods**: Data was collected from a community sample of heavy drinking emerging adults in Hamilton, Ontario (N=709). Measures included: PIU, QoL, eight psychiatric indicators, including SUD, and measures of impulsive choice (delay discounting) and impulsive personality traits. All variables that were significantly associated with PIU were subsequently examined concurrently in structural equation models.

**Results**: PIU is negatively associated with physical health ($\beta$ = -0.27, p<.01) and social relationships ($\beta$ = -0.20, p < .01), but positively associated with environmental enrichment ($\beta$ = 0.17, p < .01). For psychiatric conditions, PIU is positively associated with internalizing disorders ($\beta$=0.42, p<.01) but not SUD ($\beta$ = -0.01, p = 0.90). For impulsivity, PIU is positively associated with lack of perseverance ($\beta$ = 0.16, p < 0.01) and negative urgency ($\beta$ = 0.23, p < .01), but no other indicators.

**Conclusions**: This study provides further evidence that PIU reduces quality of life, co-occurs with internalizing psychopathology, and is associated with certain impulsive traits. The finding that PIU is not associated with SUD and impulsive choice challenges previous conceptualizations of PIU as an alternate form of reinforcer pathology or an impulse control deficit.

# #P24 - Astrocyte-derived purinergic signalling mediates neurite outgrowth and excitability in the Fragile X mouse cortex

Kathryn E. Reynolds(1), Eileen Huang(1), **\*Monica Sabbineni(1),** Eliza Wiseman(1), Nadeem Murtaza(2), Desmond Ahuja(3), Kathryn M. Murphy(3), Karun K. Singh(2) & Angela L. Scott(1)

(1) Department of Pathology and Molecular Medicine, McMaster University, Hamilton, Ontario, Canada;
(2) McMaster Stem Cell and Cancer Research Institute, McMaster University, Hamilton, Ontario, Canada;
(3) Department of Psychology, Neuroscience, and Behaviour, McMaster University, Hamilton, Ontario, Canada

**Background:** Neuronal hyperexcitability is often observed in Fragile X Syndrome (FXS), the most prevalent heritable form of intellectual disability and autism spectrum disorder. While this aberrant circuitry is typically studied from a neuron-centric perspective, glial cells are known to regulate neuronal connectivity by releasing soluble factors that influence neurite extension and synaptogenesis. The nucleotide-mediated purinergic signalling pathway is particularly instrumental in facilitating glia-neuronal communication. We have recently shown that UTP-mediated purinergic signalling is upregulated in Fmr1 KO mouse cortical astrocytes and alters secretion of synaptogenic and plasticity-related proteins, thereby forming a potential link between aberrant purinergic signalling and the development of FXS neuronal hyperexcitability.

**Objective:** We sought to determine whether elevated astrocyte purinergic signalling impacts Fmr1 KO neuronal morphology and activity during early postnatal development.

**Methods:** WT and Fmr1 KO genotypes were combined to create four groups: WT neurons cultured with WT ACM (WTN-WTACM), WT neurons cultured with Fmr1 KO ACM (WTN-KOACM), Fmr1 KO neurons cultured with WT ACM (KON-WTACM), and Fmr1 KO neurons cultured with Fmr1 KO ACM (KON-KOACM). Neurite outgrowth and branching analysis and microelectrode assays were conducted for these groups under various conditions (e.g. varying UTP concentration).

**Results:** We show that soluble factors secreted from Fmr1 KO astrocytes enhanced neurite extension and complexity in both wildtype and Fmr1 KO neurons, yet prevented UTP-mediated outgrowth. Hyperexcitable firing was also observed in Fmr1 KO neuron-astrocyte co-cultures grown on microelectrode arrays, along with moderate culture-wide deficits in neuronal firing synchrony. The selective P2Y2 purinergic receptor antagonist AR-C 118925XX normalized this aberrant Fmr1 KO activity, while the nonspecific purinergic antagonist suramin was less effective at correcting Fmr1 KO neuronal firing.

**Conclusions:** These results demonstrate the importance of astrocyte soluble factors in the development of neural circuitry and suggest that the activity of P2Y purinergic receptors may underlie pathological FXS neuronal hyperexcitability.

# ONCOLOGY

# #P25 - Natural language processing and breast cancer: a literature review with applications in radiology

**Levi Burns***(1), Ashirbani Saha (2, 3)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) Department of Oncology, McMaster University, Hamilton, Ontario, Canada; (3) School of Biomedical Engineering, McMaster University, Hamilton, Ontario, Canada

**Background**: Natural language processing (NLP), a branch of artificial intelligence (AI), is concerned with the understanding, processing, and generation of human language in text or voice format by computers. NLP in healthcare is challenging because clinical language is different from regular human discourse and includes domain-specific knowledge.

**Objectives**: To review NLP applications using radiology reports related to breast cancer, and to learn the diversity of these applications and their methodologies.

**Methods**: A search query in PubMed was performed using "breast cancer" and "NLP" or "natural language processing" without restriction on publication date. Mentioning at least one imaging modality (CT, MRI, mammography, ultrasound, x-ray) was required. Papers were included if an NLP application using radiology reports was developed and/or evaluated. The authors independently screened the articles for inclusion and resolved differences by consensus. The following information was extracted: language and type of report, sample size, imaging modality, type of NLP algorithm(s) (rule-based and/or machine learning (ML)-based), and application.

**Results**: 18 of 35 retrieved articles met the inclusion criteria. Most used English-language datasets (13/18), with others using Chinese (3/18), Dutch (1/18), and Persian (1/18). Nine articles used radiology reports only. Additional data included pathology reports (7/18), electronic medical record entries or other clinical notes (6/18), and transcriptomics reports (1/18). Sample sizes ranged from 100 patient records to a training set of 181,281 reports. Reports from mammography (7/18), ultrasound (3/18), MRI (2/18), and combinations of modalities (6/18) were retrieved. Algorithms were more often rule-based (14/18) than ML-based (8/18). Diverse NLP applications were found, with some recurring examples including disease staging or classification (7/18), identification of recurrence or metastasis (3/18), and dataset curation (2/18).

**Discussion**: We found a wide variety of NLP applications and methodologies. Future work includes expansion of this literature review, dataset curation, and development of NLP applications.

# #P26 - A comparison of adverse outcomes with the use of bevacizumab with cisplatin/paclitaxel or carboplatin/paclitaxel in recurrent, persistent or metastatic cervical cancer

Maryam Kotait (1), **Tessa Anzai\*,** Clare Reade (1), Waldo Jimenez (1), Lua Eiriksson (1), Vanessa Carlson (1), Julie My Van Nguyen (1)
(1) Department of Obstetrics and Gynecology, McMaster University, Hamilton, Ontario, Canada
(2) McMaster University, Hamilton, Ontario, Canada

**Background**: The recent GOG-240 phase 3 trial demonstrated improved oncologic outcomes with the addition of bevacizumab to standard chemotherapy for patients with metastatic or recurrent cervical carcinoma. While the previous JCOG0505 trial comparing carboplatin/paclitaxel(TC) to cisplatin/paclitaxel(TP) revealed non-inferior oncologic outcomes, with an improved side effect profile with TC, there is no recent real-world data comparing adverse events and chemotherapy response rates between TC and TP since the addition of bevacizumab.

**Objective**: To compare adverse events and response to chemotherapy of patients with metastatic or recurrent non-resectable cervical carcinoma who initiated chemotherapy between 01/2015 and 09/2021 with carboplatin/paclitaxel/bevacizumab(TCB) or cisplatin/paclitaxel/bevacizumab(TPB).

**Methods**: A retrospective study was conducted. Adverse events were classified using the National Cancer Institute Common Terminology Criteria for Adverse Events.

**Results**: Forty-seven patients were included; 29 with squamous cell histology and 18 with adenocarcinoma or adenosquamous histology. The median age was 49.5 and the median follow-up was 19 months. Thirty-eight patients received TCB and 9 received TPB; 19 were treated for metastatic disease, 3 for persistent disease, and 26 for recurrent disease.
The median number of chemotherapy cycles received was 6. While the response to chemotherapy was similar in both groups (stable disease 13.2% vs 33.3%, p=0.15, partial or complete response, 36.8% vs 33.3%, p=0.84), patients receiving TCB experienced significantly less grade 3-5 (26.3% vs 66.7%, p=0.02) and grade 1-2 adverse events (13.2% vs 55.6%, p=0.005). Bevaziumab was discontinued in 12 patients (25.5%) due to severe toxicity: fistula (n=5), hypertension (n=2), proteinuria (n=2), and small bowel perforation (n=1). This is a significantly greater rate of fistula and perforation compared to rates reported in GOG 240 (12.8% vs 3%, p=0.004).

**Conclusions**: In this cohort, patients receiving TCB had similar response to chemotherapy, but significantly less adverse events, than those receiving TPB. Bevacizumab confers a high risk of severe adverse events.

50

# PRIMARY CARE

# #P27 - Healthcare provider perspectives on intrauterine contraceptive use in nulliparous and young females: a systematic review and meta-analysis

**Muhammad U. Khalid**\*(1,2), Abirami Kirubarajan(3), Praniya Elangainesan(1,2), Maggie Li(1), Leah Bennett(1), Shereen Khattab(1), Sandra Sabongui(1), Ashna Parbhakar(1), Mara Sobel(4)

(1) Temerty Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada
(2) Institute of Health Policy, Management and Evaluation, University of Toronto, Ontario, Canada
(3) Department of Obstetrics and Gynaecology, McMaster University Medical Centre, McMaster University, Hamilton, Ontario, Canada
(4) Department of Obstetrics and Gynaecology, University of Toronto, Toronto, Ontario, Canada

**Background**: Despite the efficacy and cost-effectiveness of long-term intra-uterine forms of hormonal or mechanical contraception in people of all ages, there has been historical hesitancy amongst healthcare providers (HCPs) to prescribe these to nulliparous and adolescent women. With increasing popularity around intrauterine device (IUD) use, it remains unclear whether these perceptions have changed.

**Objective**: To characterize the knowledge and misconceptions existing amongst healthcare providers around prescribing intrauterine contraception for nulliparous, adolescent, and young women.

**Methods**: Ovid MEDLINE® was searched from inception to 14 March 2021 for peer-reviewed publications that evaluated HCP perspectives on the use of hormonal or mechanical IUDs in nulliparous and/or young women (self-described or <35 years old). Providers were defined as medical students, residents, fellows, family physicians, pediatricians, obstetricians, gynecologists, and nurses. Results were qualitatively synthesized for key themes, and a meta-analysis was performed using random-effects analysis.

**Results**: After screening 1092 titles and abstracts, 52 papers studying 22921 HCPs were included for qualitative synthesis; of these, 33 papers were included in the meta-analysis. Overall, only 19.2% of studies (n=10/52) concluded providers as being knowledgeable about the use of IUDs in nulliparous and young people, with a remarkable 49% [95% CI: 33% - 65%] of HCPs believing that the IUD was not suitable for these patients. There were no significant predictors of knowledge across continents, country income levels, and medical sub-specialty types. Reasons behind HCP hesitancy to use IUDs in nulliparous or adolescent people included misconceptions around greater pain, difficulty inserting, risks of infertility, inadequate training, and the belief that these patients were not capable of such decision-making.

**Conclusions**: There are strong misconceptions amongst healthcare providers around the world regarding IUD use in nulliparous and young people, with a global effort in continuing medical education required to improve the uptake of IUDs by healthcare providers.

# #P28 - Time trends of energy and macronutrient consumption around the world: a systematic review

Claudia Sikorski, **Shuling Yang***, Rosain Stennett, Mahshid Dehghan, Salim Yusuf, Andrew Mente

**Background**: Diets of populations have changed in the past century, but the nature and extent of these changes have yet to be examined globally.

**Objective**: To examine changes in energy and macronutrient intakes in different regions of the world.

**Methods**: We searched Medline, EMBASE, CINAHL, and key organizations for studies/reports covering trends from 1950-2019 using individual-level assessments in adults. Dietary changes were estimated per decade using linear mixed-effects models, with random slopes for geographic region.

**Results**: Of 51,328 articles/reports, 102 articles encompassing 41 countries were eligible, including Asia (31% of studies), Europe and Australasia (49%), North America (5%), Latin America (10%), and Middle East (5%). In Asia and Pacific, energy intake increased 4.8 kcal [95% confidence interval (CI): -39.5, 49.1 kcal], carbohydrate decreased 2.3% (95% CI: -1.6, -3.1%) of energy, and fat increased 1.9% (95% CI: 1.3–2.6%) of energy. Energy intake decreased in East Europe by 165.2 (95% CI: -287.1, -43.3) kcal per decade, but was variable in North Europe (-28.8 kcal, 95% CI: 27.9, -85.5 per decade) and West Europe/Australasia (-26.5 kcal, 95% CI: -89.4, 36.5 per decade). While carbohydrate intake decreased 1.8% (95% CI: -2.8%, -0.9%) of energy per decade in North Europe, carbohydrate intake increased in East Europe (5.6%, 95% CI: 1.0–10.2% per decade) and West Europe/Australasia (2.6%, 95% CI: 1.5–3.8% per decade). Conversely, fat intake increased by 0.9% (95% CI: 0.2–1.7%) of energy per decade in North Europe, and decreased in East Europe (-1.7%, 95% CI: -3.3, -0.2% per decade) and West Europe/Australasia (-2.4%, 95% CI: -3.4, -1.5% per decade). North America increased energy by 85.9 kcal (95% CI: 23.6–148.3) per decade, and increased carbohydrate by 1.4% (95% CI: 0.2 to 2.5%) energy per decade, while decreasing fat by 0.8% (95% CI: -1.7 to 0.1%). There was limited dietary trend data for countries in the Middle East and Latin America, resulting in variable trends. Trends in protein were generally stable (± 0.1-0.7% energy/decade) across all regions.

**Conclusions**: Marked changes in dietary intakes are found in different world regions. Our findings help to uncover gaps in dietary data around the world, identify countries that would benefit from targeted nutritional interventions, and provide estimates of intake that can be used to evaluate efficacy of policies and interventions.

# #P29 - Clinical Empathy Impacts Patient Outcomes: Perspectives of Canadians with Chronic Illness

Shira Gertsman*(1), Cezara Ene(1), Sasha Palmert(1), Amy Liu(1), Mallika Makkar(1), Ian Shao(1), Johanna Shapiro(2), Connie Williams(3,4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) UC Irvine School of Medicine, University of California Irvine, Irvine, California, USA
(3) Department of Pediatrics, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada
(4) Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada

**Background**: "Clinical empathy" is the ability of a physician to understand the patient's whole illness experience, communicate this understanding, and act on it to create a treatment plan with the patient. Although clinical empathy provides substantial benefits to both physicians and patients, there is evidence that medical students experience a decline in empathy throughout their training.

**Objective**: The primary objective of this study was to generate a theoretical model of clinical empathy grounded in the perspectives of chronically ill patients, to be used as a basis for empathy-focused curricular development.

**Methods**: Adults with chronic illness who recently used the Canadian healthcare system were recruited from chronic illness support groups on Facebook. Each participant took part in a semi-structured focus group. Focus group transcripts were coded using the constant comparative method and a theory was constructed using the tenets of constructivist grounded theory analysis.

**Results**: Twenty patients from across Canada participated in six focus groups. A two-sided theory of the presence and absence of clinical empathy was developed from patients' response. Perceived presence of physician empathy beget positive internal processing by the patient leading to increased efficacy of healthcare delivery and enhanced mental health outcomes. Negative patient internal processing in response to perceived absence of empathy led to reduced quality and increased utilization of healthcare, negative health outcomes, and disruptions in patient's personal lives. In particular, negative mental health outcomes including depression, anxiety, and suicidality were emphasized as being common consequences of the absence of clinical empathy.

**Conclusion**: Clinical empathy can have life-altering impacts on patients and as such is an essential aspect of quality healthcare. The very definition of clinical empathy involves understanding the patient's lived experience; thus, any valid intervention to improve clinical empathy must be informed by patient perspectives such as these.

# ORTHOPEDICS

# #P30 - Factors affecting fear of re-injury following anterior cruciate ligament reconstruction (ACLR): a systematic review

Prushoth Vivekanantha*(1), Basit Mir (2), Saihajleen Dhillon (3), Odette Cotnareanu (4), Darren de SA (2)

(1) Michael deGroote School of Medicine, McMaster University, Hamilton, Ontario; (2) Division of Orthopaedics, McMaster University, Hamilton, Ontario; (3) Faculty of Health Sciences, McMaster University, Hamilton, Ontario; (4) Faculty of Health Sciences, Queens University, Kingston, Ontario

**Introduction**: Anterior cruciate ligament (ACL) tears are one of the most common injuries in sport. ACL reconstruction (ACLR) can improve structural integrity of the knee, however, athletes are still unable to reach pre-injury level of performance due to kinesiophobia, or an irrational fear of reinjury. The purpose of this review was to identify key factors which may contribute to increases in kinesiophobia in patients following ACLR surgery.

**Methods**: A systematic search across three databases was conducted to yield studies focusing primarily on kinesiophobia after ACLR. Two reviewers were responsible for independent screening of the studies. Quality assessment of the included studies was conducted according to the Methodological Index for Non-Randomized Studies criteria.

**Results**: Twenty-three studies satisfied the inclusion criteria and resulted in 1973 total patients with a mean age of 27.6 years. Ninety-one percent of included studies used variations of the Tampa Scale of Kinesiophobia to quantify kinesiophobia. An increase in kinesiophobia following ACLR was associated with pain and low functional status during activities of daily living and sports-specific tasks. This was demonstrated by low International Knee Documentation Committee scores, Knee Injury and Osteoarthritis Outcome scores, Tegner activity scores, ACL-return to sport scores, and Lysholm knee scores post ACLR. Patients with an increased injury to surgery time (>=3 months) had higher levels of kinesiophobia compared to patients with shorter injury to surgery time. Other associations with high kinesiophobia included female sex, patellofemoral pain, osteoarthritis, low single leg-hop performance, muscular imbalance, and gait asymmetry.

**Conclusion**: Pain and overall knee function may contribute to increased fear of re-injury or kinesiophobia following primary ACLR. Timelines to and from surgery and lack of confidence in returning to functional activities may also exacerbate levels of kinesiophobia in patients during recovery.

# QUALITY IMPROVEMENT

# #P31 - Systematic review of the compliance of randomized controlled trials in vascular surgery with the CONSORT statement

**Nikhil Nair Hariharan***(1), Jacob Alaichi(2)(3), Faysal Naji (2)(4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada
(2) Faculty of Health Sciences, McMaster University, Hamilton, ON, Canada
(3) Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, ON, Canada
(4) Department of Vascular Surgery, Hamilton Health Sciences, Hamilton, ON, Canada

**Purpose**: In evidence-based medicine, randomized controlled trials (RCTs) are the gold standard for assessing the safety and efficacy of surgical interventions. The Consolidated Standards of Reporting Trials (CONSORT) statement provides a guideline for reporting RCT results. This study evaluated the adherence of vascular surgery trials from the last decade (2010-2020) with the CONSORT statement.

**Methods**: MEDLINE and Embase were searched for vascular surgery RCTs published between January 1st 2010 and July 30th 2020. Two authors independently assessed titles, abstracts and full texts. Studies were reviewed for compliance with reporting of 31 items in the CONSORT checklist. The main outcome of this study is the CONSORT score, or the sum of CONSORT checklist items per trial.

**Results**: Overall, 565 studies were identified, and 154 studies were included. The median CONSORT score was 20 of 31 items (64.5% [range 26%–97%]). The poorest scoring items included item 10 – implementation (33%), item 12b – methods for additional analyses (24%) and item 24 – protocol (31%). Compliance was highest for item 15 – baseline data (97%) and item 22 – interpretation (99%). Item 1b – abstract was the least adequately reported item with 0 studies meeting the CONSORT criteria. Secondary analysis with the CONSORT abstract checklist showed that the median CONSORT for Abstract score was 9 of 16 items (56%). Reporting quality steadily improved from 2010 to 2020.

**Conclusion**: The findings necessitate improvements in the reporting quality of vascular trials, which can be bolstered by enforcing the CONSORT guidelines at the peer-review stage of journal submissions.

# #P32 - Systematic review of the fragility of statistically significant findings from randomized controlled trials in vascular surgery

**Nikhil Nair Hariharan***(1), Jacob Alaichi(2)(3), Faysal Naji (2)(4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, ON, Canada
(2) Faculty of Health Sciences, McMaster University, Hamilton, ON, Canada
(3) Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, ON, Canada
(4) Department of Vascular Surgery, Hamilton Health Sciences, Hamilton, ON, Canada

**Purpose**: The fragility index calculation evaluates the robustness of statistically significant findings and supplements the p-value in randomized controlled trials (RCTs) with dichotomous outcomes. The fragility index is the minimum number of patients in one arm of a randomized trial whose outcome would have to change for the results of the trial to change from statistically significant to nonsignificant. This systematic review assessed the fragility index in vascular surgery trials from the last decade (2010-2020).

**Methods**: MEDLINE and Embase were systematically searched for RCTs published between January 1st, 2010 and July 30th, 2020 in four major vascular surgery journals. Two authors independently assessed titles, abstracts and full texts. RCTs with a parallel arm design and a statistically significant dichotomous outcome were included. The fragility index was calculated.

**Results**: Overall, 565 articles were identified, and 63 articles were included. The median fragility index was 0 (range 0-23), which means that recalculating p-values using Fisher's exact test eliminated statistical significance in most trials. The fragility index was 0 for 71.4% of the included vascular surgery trials. The median sample size was 121 patients (range 20-851) and there was no correlation between total sample size and the fragility index.

**Conclusion**: Vascular surgery trials with statistically significant dichotomous outcomes are frequently fragile. This fragility shows that clinicians should exercise caution when interpreting randomized controlled trials and altering their patient care accordingly. A possible remedy to this fragility could be including the FI calculation as a part of the journal submission process.

# ANESTHESIOLOGY

60

# #P33 - Long-term and serious outcomes of interventional treatments for chronic, axial or radicular, non-cancer, spinal pain: a systematic review and meta-analysis of non-randomized studies.

Faheem Malam*(1), Saad Asif(1), Muhammad F. Khalid(1), Cameron W. Leafloor(2), Patrick J. Hong(3), Tal Levit(1), Rachel J. Couban(4), Dena Zeraatkar(4), Jason W. Busse(4,5)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada; (2) Department of Emergency Medicine, University of Ottawa, Ottawa, Ontario, Canada; (3) Department of Anesthesiology & Pain Medicine, University of Toronto, Toronto, Ontario, Canada; (4) Department of Health Research Methods, Evidence, and Impact, McMaster University, Hamilton, Ontario, Canada; (5) Department of Anesthesia, McMaster University, Hamilton, Ontario, Canada

**Background**: Chronic non-cancer pain is a complex condition that continues to be a significant health challenge associated with considerable socioeconomic burden. Non-surgical interventional procedures such as epidural steroid injections, nerve blocks and radiofrequency ablation for the management of chronic non-cancer spinal pain are routinely offered by clinicians; however, clinical guidelines provide conflicting recommendations. Existing evidence syntheses have included randomized trials which only capture short-term and frequent harms. Patients and clinicians also require information on long-term and rare harms to facilitate evidence-based decision making.

**Objective**: To summarize the evidence on the prevalence of long-term and infrequent adverse events related to interventional procedures for chronic non-cancer spinal pain.

**Methods**: We searched MEDLINE, EMBASE and CINAHL for non-randomized studies reporting any patient-relevant harms or adverse events among patients with chronic axial, and/or radicular, non-cancer spinal pain that received interventional procedures directed at pain management. Systematic literature screening, data abstraction and risk of bias appraisal was conducted independently and in duplicate by pairs of reviewers. Random-effects meta-analysis will be used to pool results across studies for patient-important adverse events.

**Results**: We included 57 longitudinal studies (54 non-comparative, 3 comparative) in our analysis, that enrolled 4780 patients, with a follow-up range of 8 – 139 weeks. The most commonly reported conditions included disc herniations in 20 studies, spinal stenosis in 9 studies and degenerative lumbar disc disease in 6 studies. Epidural injections were used in 23 studies, joint radiofrequency ablation or denervation in 22 studies and joint injections or nerve blocks in 9 studies. The majority of reported complications included transient pain exacerbations, vasovagal episodes, and infection.

**Conclusions**: Our systematic review will provide a summary of the prevalence of long-term and infrequent adverse events associated with interventional treatments for chronic spinal pain. These findings will inform development of a clinical practice guideline.

# #P34 - Systematic review of randomized controlled trials evaluating analgesic regimens after nephrectomy: Protocol

Braden Millan(1), **\*Geemitha Ratnayake(2),** Harsha Shanthanna(3,4,5), Piotr Zareba(1,6)

(1) Division of Urology, Department of Surgery, McMaster University, Hamilton, Ontario, Canada
(2) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(3) Department of Anesthesia, McMaster University
(4) Department of Surgery, McMaster University
(5) Department of Department of Health Research Methods, Evidence, and Impact, McMaster University
(6) Juravinski Hospital and Cancer Centre, Hamilton, Ontario, Canada

**Background:** Post operative analgesia is essential to maintain patient comfort and prevent chronic postsurgical pain. Post nephrectomy, pain arises from the surgical site, pelvic organ nociception, and diaphragmatic irritation. The current standard for analgesia includes treatment with opioids, which while effective analgesics, are less effective at treating movement evoked, dynamic pain. Opioids are also associated with respiratory depression and nausea and vomiting. As such, multimodal analgesic regimens including neuraxial blocks, fascial plane blocks, and local anesthetic infiltration, are currently being investigated.

**Objective:** The objective is to elucidate the most effective multimodal analgesic regimen in patients undergoing nephrectomy, partial nephrectomy or nephroureterectomy.

**Method:** Medline, Embase and Cochrane Central Register of Controlled Trials (CENTRAL) was searched from inception to March 2022 for randomized controlled trials investigating analgesic regimens used after radical nephrectomy, partial nephrectomy or nephroureterectomy. Reviewers in duplicate screened 568 abstracts and reviewed 111 full-texts. Data abstraction and risk of bias assessment will be conducted in duplicate using a piloted standardized form and the Cochrane Collaboration Revised Risk of Bias tool respectively. Discrepancies will be discussed to achieve consensus, otherwise a majority vote will be conducted. Data will be analyzed using Cochrane Review Manager 5.4. The results will be synthesized descriptively and meta-analysis using a random effects model will be considered if 3 or more studies use the same combination of analgesics and are otherwise comparable. Grading of Recommendations Assessment, Development and Evaluation (GRADE) will be used to assess the quality of evidence.

**Discussion:** The results of this study can inform the decision making of surgeons, anesthesiologists and other providers regarding optimal care for patients after nephrectomy. This is particularly relevant given the emergence of enhanced recovery after surgery (ERAS) protocols that rely on adequate pain control, among other things to reduce length of stay and improve outcomes after surgery.