12th Annual

MCMASTER MEDICAL STUDENT RESEARCH DAY

May 5th, 2021
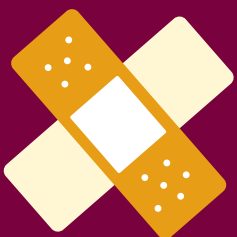
MMSRD

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CONFERENCE PROGRAM

9:30-9:45 **WELCOMING REMARKS & OVERVIEW**

MMRSD Chairs and Committees

9:45-10:50 **PRESENTATION SESSION #1**

7 Minute Presentations

10:50-11:00 **BREAK**

11:00-11:45 **POSTER PRESENTATIONS #1**

See Master Excel Document to select which presentations to watch

PREP PANEL #1

Paths to Medical School

11:45-12:00 **BREAK**

12:00-12:45 **KEYNOTE SPEAKER**

Dr. Salim Yusuf
Progress in Little Steps: A 45 year Journey of Discovery and Fun

12:45-1:00 **BREAK**

1:00-1:45 **POSTER PRESENTATION #2**

See Master Excel Document to choose which presentations to watcb

PREP PANEL #2

Keeping Calm in the Chaos: Adapting to Unpredictable Obstacles

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3 Minute Presentations

2:50-3:10 **BREAK**

3:10-3:30 **AWARDS PRESENTATIONS & CLOSING REMARKS**

3:30-4:00 **NETWORKING SESSION**

IMPORTANT LINKS

MAIN CONFERENCE: [ZOOM LINK](#)

USED FOR:
- WELCOMING REMARKS
- ORAL PRESENTATION SESSIONS #1 AND #2
- KEYNOTE SPEAKER
- AWARDS PRESENTATIONS AND CLOSING REMARKS

POSTER PRESENTATIONS: [EXCEL DOC](#)

USED FOR:
- POSTER PRESENTATIONS #1 AND #2
- REVIEW EXCEL AND CHOOSE THE LINKS OF THE ROOMS YOU WOULD LIKE TO ATTEND

PREP PANEL #1: [ZOOM LINK](#)

PREP PANEL #2: [ZOOM LINK](#)

USED FOR:
- PREP PANELS #1 AND #2
- UNDERGRADUATE MENTORSHIP

NETWORKING: [EXCEL DOC](#)

ACKNOWLEDGEMENTS

ABOUT MMSRD

Welcome to the 12th 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), and Andrew Chen and Cindy Nguyen (2020/21).

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

CO-CHAIR WELCOME

Dear Students, Faculty, and Community Members,

We are really excited to welcome you to the 12th 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. Although this year's conference is being held virtually, we are thrilled that this platform has allowed us to invite medical students from all across Ontario. The 2021 MMSRD committee is proud to have created a program filled with exciting presentations, including one from our keynote speaker, Dr. Salim Yusuf.

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 poster, 3MT, and 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 with topics ranging from COVID-19 to medical education. These categories reflect the diversity and strength of research undertaken by students at McMaster and across Ontario.

For the third 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 and Mike Weir 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,

Andrew T. Chen
MD Student (HAM)
Class of 2023

&

Cindy H. Nguyen
MD Student (NRC)
Class of 2023

PREMEDICAL RESEARCH ENGAGEMENT PROGRAM (PREP)

PANEL 1: PATHWAYS TO MEDICAL SCHOOL

PANELISTS:
- ANGELA DONG
- BRADLEY MURPHY
- JOSHA RAFAEL

MODERATORS:
- BRITTANY BISHOP
- SONYA CUI

PANEL 2: KEEPING CALM IN THE CHAOS: ADAPTING TO UNPREDICTABLE OBSTACLES

PANELISTS:
- SASHA PALMERT
- ELLIOT POLSTER
- KATIE VAN KAMPEN
- DAN HOLSTEIN

MODERATORS:
- ANNE-SOPHIE FORTIER
- HENRY HE

THANK YOU TO OUR MENTORS:

COLIN WHALEY, KATHERINE FULLER, NAMAN ARORA, PARNIAN PARDIS, MURALIE VIGNARAJAH, JASMYN CUNNINGHAM, MICHELLE SCHNEEWEISS, CODY TRAN, JONATHAN BELLINI, JACQUELINE SLOMOVIC, CHRISTINE CHA, SASHA PALMERT, ANGELA DONG, ISABELLA STEFANOVA, LAURA FALLICO, JAMIE ZHEN, CANDICE LUO, YUAN QIU, KATIE VAN KAMPEN

KEYNOTE SPEAKER

Dr. Salim Yusuf

Salim Yusuf, D.Phil, FRCPC is a Distinguished University Professor of Medicine at McMaster University, and Executive Director of the Population Health Research Institute in Hamilton, Canada. He has been inducted into the Royal Society of Canada and the Canadian Medical Hall of Fame, and has been appointed as an Officer of the Order of Canada, as well as winning the Canada Gairdner Wightman award. He has led over 50 major international collaborative studies that have enhanced strategies to prevent cardiovascular disease globally. He is a Past President of the World Heart Federation, where he initiated an Emerging Leaders program in 100 countries with the aim of halving the CVD burden globally within a generation.

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McMASTER UNIVERSITY MEDICAL JOURNAL

VOLUME 17, ISSUE 1 | 2020

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ORAL PRESENTATIONS

7 Minute Presentations
9:45-10:50

Arjun Pandey
Bianca Ziegler
Victoria Forcina
Tharani Anpalagan
Yuan Qiu
Angela (Hong Tian) Dong

3 Minute Presentations
1:45-2:50

Ibrahim Mohammad Nadeem
Hanu Chaudhari
Andrew T Chen
Jonah Rakoff
Kay Wu
Conor Donnelly
Morgan Yuan
Yazad Bhathena
Colin Raymond Joseph Whaley
Myles Benayon
Jessica Gormley

7 MINUTE PRESENTATIONS

Aortic Impedance is Unchanged after 6 Months of Spaceflight

Arjun Pandey (1), Andrew D Robertson (2),Katelyn N Wood (2),Danielle K Greaves (2), J Kevin Shoemaker (3), Philippe Arbeille (4), Richard L Hughson (2)

(1) Michael G. DeGroote School of Medicine, Hamilton, CA; (2) Schlegel-University of Waterloo Research Institute for Aging, University of Waterloo, Waterloo, CA; (3) School of Kinesiology, Western University, London, CA; (4) UMPS-CERCOM, School of Medicine, University of Tours, Tours, FR

Background: Cardiovascular structure and function are altered during long-duration spaceflight. Accumulating evidence shows elevated arterial stiffness in astronauts during the initial period following long-duration spaceflight, but long-term follow-up has not been examined.

Hypothesis: We hypothesized that long-duration spaceflight would increase aortic characteristic impedance (Zc) up to one year post-flight.

Methods: The Vascular Echo study assessed arterial structure and function at 4, 14, 60, and 365 days after return to Earth (R+). We acquired simultaneous aortic blood velocity and carotid artery pressure waveforms using Doppler ultrasound and applanation tonometry, respectively, in eight astronauts (two females; spaceflight duration: 6.0±0.8 months). Zc was assessed through frequency-domain and time-domain approaches. Total arterial compliance (TAC) was calculated using the area method. Peripheral vascular resistance (PVR) was quantified from the impedance modulus at 0 Hz. Statistical analysis used linear mixed-effects models, incorporating random intercepts for each astronaut, with time as a fixed effect.

Results: Zc was unchanged across all timepoints in both frequency-domain (p=0.57) and time-domain analyses (p=0.39). TAC was also unchanged (p=0.58). Although not statistically significant, PVR tended to be reduced immediately post-flight (p=0.12); compared to pre-flight (7.2±2.4 mmHg·s·cm-1), PVR tended to be lower during early post-flight (R+4: 6.4±1.1; R+14: 5.4±1.0 mmHg·s·cm-1) but appeared to recover over time (R+60: 7.0±1.6; R+365: 7.1±1.5 mmHg·s·cm-1).

Discussion/Conclusions: Zc quantifies a combination of the resistive and elastic properties of arteries, varying inversely with vessel cross-sectional area and directly with stiffness. Given documented increases in stiffness within days of landing, the lack of change in aortic impedance may imply that changing resistance counteracts increased vessel stiffness. As soon as 60 days post-flight, both impedance and underlying resistance measures were similar to those at pre-flight. This provides the first longitudinal evidence that changes in vascular structure and function following long-duration spaceflight may recover relatively quickly upon returning to Earth.

Antenatal care utilization in the fragile and conflict-affected context of the Democratic Republic of the Congo

Bianca, R, Ziegler (1), Moses Kansanga (2), Yuji Sano (3), Joseph Kangmennaang (4), Daniel Kpienbaareh (2), Isaac Luginaah (2)

(1) Michael G DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada;
(2) Department of Geography, Western University, London, Ontario, Canada; (3) Department of Sociology and Anthropology, Nipissing University, North Bay, Ontario, Canada; (4) Department of Geography and Earth Sciences, University of North Carolina Charlotte, NC, United States of America

Introduction: Maternal mortality represents one of the widest gaps between the Global North and South. Ninety-nine percent of maternal deaths occur in developing countries, with over half occurring in sub-Saharan Africa. This health indicator became a global priority when the United Nations' Sustainable Development Goal (SDG) 3.1 set out to decrease the global maternal mortality rate to less than 70 per 100 000 births by 2030. In the Democratic Republic of the Congo (DRC), 473 of every 100 000 women who give birth die due to pregnancy-related complications. These deaths could be prevented through enhanced access and utilization of antenatal care and skilled birth attendants. However, amid prolonged conflict, violence, and authoritarian governments, the DRC has been classified as a fragile and conflict-affected situation and women face difficulties accessing maternal health services.

Objective: This study examined the impact of conflict on the utilization of antenatal care and skilled birth attendants in the DRC.

Methods: Binary logistic regression analyses with three sequential models were conducted using the 2007 and 2013-14 DRC Demographic and Health Surveys (n = 14 498), as well as a Near Analysis Geographic Information System exploration.

Results: Women living in regions with extremely high levels of prolonged conflict were significantly less likely than those in regions with moderate levels of conflict to have their first antenatal care visit within the first trimester (OR = 0.29, p < 0.01), and to have four visits (OR = 0.46, p < 0.01). Women in regions with extremely high levels of conflict (OR = 0.41, p < 0.01) were less likely to meet the World Health Organization's antenatal care recommendations compared to those in moderate conflict regions.

Conclusion: The findings suggest that conflict-affected countries, such as the DRC, require context-specific intervention

Motivating Factors, Barriers and Facilitators of Community Intensive Care Units' Participation in COVID-19 Pandemic Research: A Cross-Sectional Canadian Survey

Victoria Forcina, Anna Hwang, Alexandra Binnie, Robert Fowler, Deborah C Cook, Karen E Burns, Kylee Hunter, Erick Duan, Lisa Patterson, Jennifer LY Tsang.

Background: During the pandemic, community hospitals have provided care for most patients with COVID-19 in Canada. However, only a small number of community hospitals are participating in clinical trials. To understand the research landscape in community hospitals, we conducted a survey to explore the motivating factors, perceived barriers and facilitators of participation in COVID-19 pandemic research.

Methods: A cross-sectional survey was administered to critical care physicians, nurses, allied health professionals, research staff and hospital administrators. Data were described as mean and standard deviation or median and interquartile range for continuous variables and number and percentage for categorical variables. Data from Likert scales were treated as continuous. Ethics approval was obtained from the Hamilton Integrated Research Ethics Board (#11101).

Results: 73 health care professionals representing 18 community ICUs were surveyed. Participants' mean research interest was a 5.2 on a 7-point Likert scale from "not interested (1)" to "very interested (7)" (SD=1.9). The most common motivating factors were improving clinical care and outcomes, advancing medical knowledge, and staying informed about current research. The most common barriers were lack of start-up funding, lack of research experience in the ICU, and the perception that community ICUs are not known or expected to do research. The most common facilitators were availability of an experienced research coordinator, and dedicated external funding for start-up and ongoing costs of research programs.

Conclusion: To our knowledge, this is the first study exploring the motivating factors, barriers and facilitators of community ICUs' participation in COVID-19 pandemic research. Our results demonstrate a moderate to high level of community ICU stakeholder interest in participating in COVID-19 pandemic research. Most stakeholders believe that engaging in research would result in better patient care and advancement of medical knowledge, in addition to improvement of job satisfaction. Barriers to participation are principally structural and financial.

Should we routinely screen for frailty prior to Gynecologic Oncology Surgery? Frailty as a predictor of adverse postoperative outcomes in elderly patients

Sarah Mah, *Tharani Anpalagan, Maura Marcucci, Vanessa Carlson, Lua Eiriksson, Waldo Jimenez, Clare Reade, Julie My Van Nguyen

Department of Gynecologic Oncology, McMaster University, Hamilton, Ontario, Canada

Background: Frailty is increasingly recognized as an adverse prognostic factor of postoperative morbidity and survival in several surgical disciplines. There is no consensus on routine frailty screening in Gynecologic Oncology.

Objectives: Our goal was to evaluate the predictive role of the National Surgical Quality Improvement Program(NSQIP) comorbidity-based modified Frailty Index-5(mFI-5) in Gynecologic Oncology patients over the age of 70.

Methods: Elective laparotomies between 01/2016-09/2020 at the Juravinski Hospital in Hamilton, ON were reviewed using prospectively-collected NSQIP data and chart review. Complication severity was assessed by Clavidien-Dindo classification. The primary outcome was rate of 30-day grade III-V complications. Secondary outcomes were: grade II-V complications, myocardial injury, length of stay(LOS), non-home discharge, and non-initiation/non-completion of adjuvant chemotherapy. Logistic regression analysis was performed. Survival analysis and receiver-operator characteristic curves are underway.

Results: In this cohort of 259 patients, frail patients(mFI-5≥2) were at significantly greater risk of grade III-V complications (OR23.77, 95%CI 9.69-66.26, p<0.0001), grade II-V complications (OR3.8, 95%CI 1.96-7.85, p=0.0002), myocardial injury (OR3.44, 95%CI 1.66-7.05, p=0.0009), LOS≥5days (OR2.96, 95%CI 1.61-5.52, p=0.0006), non-home discharge (OR7.37, 95%CI 2.81-20.46, p<0.0001), and non-initiation/non-completion of chemotherapy (OR7.34, 95%CI 2.43-23.06, p=0.0006), than non-frail patients on univariate analysis(UVA).
On multivariable analysis, frailty remained independently associated with grade II-V complications and grade III-V complications (OR4.64, 95%CI 2.31-9.94, p<0.0001, controlling for stage, operative duration and intraoperative complication, and OR24.49, 95%CI 9.72-70.67, p<0.0001, adjusting for BMI, stage and operative duration, respectively). On UVA, age, surgical complexity score, and smoking were not predictive of complications. Frailty also independently predicted non-home discharge (OR7.37, 95%CI 2.81-20.46, p<0.0001) when adjusting for age.

Conclusion: Frailty as assessed with mFI-5, independent of age, strongly predicted morbidity and non-home discharge after Gynecologic Oncology surgery. Strategies for perioperative optimization could help address these disparities. mFI-5 is a concise tool that can be used for routine frailty screening and risk stratification.

Remote video-based suturing education with smartphones (REVISE): a randomized controlled trial

*Kevin Ren(1), *Yuan Qiu(1), *Karyssa Hamann(1), Nathan How(2), Cameron Leveille(2), Alexandra Davidson(2), Adam Eqbal(2), Yaeesh Sardiwalla(2), Michael Korostensky(2), Tyler McKechnie(2), Elizabeth Lee(2), Ilun Yang(2)

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

Suturing is a skill that surgical trainees must master. Due to COVID-19, medical schools needed to transition from in-person to virtual avenues of teaching, including procedural skills. Our primary objective was to determine whether virtual video-based feedback is no worse than in-person feedback in improving novice medical students' suturing skills.

Fifty-four medical students were assigned either to an experimental arm and randomized to receive remote-recorded feedback (RRF) or remote-live feedback (RLF), or to a control arm to receive in-person feedback (control), with 18 participants in each group. Participants first learned to suture via an online module, then recorded themselves performing a standardized suturing task at home (Figure 1). Customized feedback was then provided by a surgical resident that received standardized training for this project.

RRF participants received a feedback video, RLF participants received live feedback over Zoom, and control participants received feedback in-person. Participants then recorded another video of the same suturing task. Pre-feedback and post-feedback suturing performances were scored by blinded assessors using the University of Bergen Suturing Skills Assessment Tool (UBAT). Our primary outcome measure is the score difference between pre and post-feedback videos.

RLF and RRF groups were compared for statistical significance using a two-tailed paired t-test. Twenty-seven participants (median age 22) were included in the interim analyses. Post-feedback UBAT scores were not significantly different between groups (70.34 [-25.41, 127.34] versus 11.34 [-99.66, 78.34], p>0.05), with a higher score indicating better performance. Although there is a trend towards RLF demonstrating greater improvement (32 [-10, 59.25] versus 25 [-63, 77], p>0.05), this is not statistically significant.

Thus far, there is no significant difference between groups in pre-feedback scores, post-feedback scores, or score difference. Future steps include analyzing videos for all participants and comparison to the control arm.

Topical corticosteroid (TCS) phobia in parents of children with eczema: a scoping review

*Angela (Hong Tian) Dong (1), Audrey Dong (2)

(1) Michael G. Degroote School of Medicine, McMaster University, Hamilton, Ontario, Canada (2) Richmond Hill H.S., York Region, Ontario, Canada

Despite being first line treatment for pediatric atopic dermatitis (AD), topical corticosteroids (TCS) lack significant medication compliance due to decreased trust and "corticophobia" from parents/caregivers. Fears such as undesirable side effects like skin atrophy, the disputed risk of 'red man syndrome' post-discontinuation, and Internet sources pushing for more natural remedies all play into corticophobia prevalence and mismanagement of AD.

This scoping review examined 11 studies from all over the world regarding factors contributing to corticophobia, and analyzed potential courses of action to address corticophobia.

An overwhelming majority of those studies advocated for increased patient education from health professionals to dispel misinformation, and stated the value of available non-steroidal eczema medication options to provide alternatives that prioritized patient care regardless of counselling outcomes. The current dearth of peer-reviewed studies analyzing iatrogenic effects of long-term TCS usage and addressing claims of steroidal withdrawal or red man's syndrome also are a factor in the prevalence of corticophobia-facilitating online anecdotal reports. Cultural factors such as a mistrust in Western medicine - especially in Asian countries where TCS phobia has been noted disproportionately in the literature review - may contribute to misunderstandings and mistrust. Approaching TCS phobia in a collaborative, open manner acknowledging caregiver fears and explaining the alternate information sources is essential for patient education and medication adherence.

3 MINUTE PRESENTATIONS

Addition of CT to improve the diagnostic confidence for the detection of sacroiliac joint erosions in patients with equivocal MRI findings

*Ibrahim M. Nadeem (1), Sohaib Munir (2,3), Euan Stubbs (2,4), Vincent Leung (2,4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Department of Radiology, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada
(3) Department of Diagnostic Imaging, Juravinski Hospital, Hamilton, Ontario, Canada
(4) Department of Diagnostic Imaging, St. Joseph's Healthcare Hamilton, Hamilton, Ontario, Canada

Background: Seronegative spondyloarthritis (SpA) is a significant cause of debilitating change throughout the axial skeleton often requiring chronic immunosuppressants. As treatment should be initiated during the 'window of opportunity' – of the reversible inflammatory lesions prior to development of secondary irreversible structural changes – accurate and early detection is important. Sacroiliac joint (SIJ) erosions are critical diagnostic findings for SpA.

Objective: To determine if low dose CT can improve the diagnostic confidence for the detection of SIJ erosions in patients with equivocal MRI findings.

Methods: A retrospective analysis of adult patients who had a dedicated SIJ MRI from September 2017 to September 2019, and subsequent CT within 12 months, was conducted. Using a 5-point Likert scale, two reviewers evaluated the de-identified MRI and CT images in randomized order and in separate sessions to answer the question: 'Does the patient have SIJ erosions?'. A Fisher's exact test was used to analyze the difference in diagnostic confidence, and intraclass correlation coefficient (ICC) was used to determine interrater reliability.

Results: 54 patients were included in the analysis (average age, 43.9 years). The average time interval between initial SIJ MRI and subsequent CT was 14.4 weeks (range, 5.6 to 50.3 weeks). CT resulted in significantly more cases with definitive diagnostic confidence than cases with probable or equivocal confidence compared to MRI ($p < 0.001$). Amongst cases with equivocal findings on MRI, 73.2% of cases had definitive diagnoses on CT. There was moderate interrater agreement for MRI, with an ICC of 0.490 [95% CI, 0.258 – 0.669], and excellent agreement for CT, with an ICC of 0.832 [95% CI, 0.728 – 0.899].

Conclusion: Overall, CT led to significantly increased diagnostic confidence and higher interrater reliability for the detection of SIJ erosions compared to MRI. Judicious use of CT may be useful in detecting SIJ erosions in patients with equivocal MRI findings.

Influenza vaccination on seasonal coronavirus in Canadian Hutterite communities

*Andrew T. Chen (1), Pardeep Singh (1), Matthew S. Miller (2), Mark Loeb (1)

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

Background: The coronavirus disease (COVID-19) epidemic has had an immense impact worldwide. As the outbreak develops, its circulation with seasonal influenza has precipitated fears of coinfections, posing considerable morbidity and mortality. While the influenza vaccine decreases its infection rate, there remains conflicting evidence on the vaccine's impact on host susceptibility to other respiratory viruses, including coronaviruses. Therefore, the primary aim of this study was to assess the effect of influenza vaccination on the incidence of seasonal coronaviruses infection.

Methods: 3273 individuals residing in Canadian Hutterite communities were randomly assigned to receive the seasonal influenza vaccine or a control hepatitis A vaccine. All individuals were monitored for influenza-like illness and where appropriate, tested for laboratory-confirmation of influenza and non-influenza respiratory viruses using RT-PCR. The incidence of total seasonal coronaviruses was calculated in both groups. The hazard ratio (HR) was determined using a Cox proportional hazards regression model. The attack rate of coronavirus amongst the two groups was modeled using a Kaplan-Meier survival curve. The incidence of other non-influenza respiratory viruses was analyzed. Statistical analyses were conducted using the open software R.

Results: Baseline characteristics were similar between the influenza vaccination group (N=1773) and the control group (N=1500). There were 123 (3.8% of 3273) individuals with at least 1 episode of laboratory-confirmed coronavirus infection. Communities assigned to the influenza vaccine had 51% risk reduction in coronavirus infection (0.18/1000 person-days [0.13-0.24] vs 0.36/1000 person-days [0.28-0.44], HR=0.49, p=0.11). At the end of the surveillance period, there were significantly more individuals in the control group infected with coronavirus (5.1% vs 2.6%, p=0.0006). The incidence of other non-influenza respiratory illnesses was not significantly lower in the influenza vaccine group.

Conclusion: The influenza vaccine does not increase the risk of coronavirus infection. Further randomized controlled trials are needed to determine the potential protective effect of the influenza vaccine against coronavirus infections.

A pilot quality improvement project implementing a nursing directive for children with suspected appendicitis

*Hanu Chaudhari(1), Reid Rebinsky(1), Enrico Rullo(1), Michelle Schneeweiss(1), Mohamed Eltorki(2)

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

(2) Division of Pediatric Emergency Medicine, McMaster University, Hamilton, Ontario, Canada

Although appendicitis accounts for an estimated 7-10% of abdominal pain cases in the emergency department (ED), patients with suspected appendicitis tend to wait to be seen by a physician, resulting in diagnostic delays. The utility of a nursing directive to expedite the diagnostic process is unclear and needs further exploration.

Our study aims to describe key components of suspected appendicitis patients seen at a pediatric ED and pilot a directive that allows nurses to order blood work, urine tests, analgesics, fluids, and ultrasound (U/S) prior to physician assessment.

A chart review was conducted of children aged 3-17 years who presented with ≤4 days of acute abdominal pain, right lower quadrant tenderness with walking, and right iliac fossa tenderness between April and October 2019. We excluded patients with chronic medical conditions or neurodevelopmental disorders. Patient baseline characteristics and ED flow metrics were abstracted using a standardized case report form and compared before and after directive implementation. For differences in proportions, we conducted a χ2 test and for continuous variables, we used student's t-test.

We screened 2400 patient charts and 220 (9.2%) patients were eligible. The mean duration of time in hours from ED presentation to: (i) blood work, 3.1 (95% CI [2.6, 3.5]), (ii) U/S order, 2.5 (95% CI [2.3, 2.7]), and (iii) U/S report, 5.0 (95% CI [4.6, 5.4]). We piloted the directive on 39 patients and achieved a shorter duration of time from ED presentation to blood work by 2.1 hours (95% CI [1.2, 2.9]), U/S order by 1.2 hours (95% CI [0.8, 1.7]), and U/S report time by 1.3 hours (95% CI [0.5-2.1]).

In our centre, children with suspected appendicitis spend almost 5 hours in the ED prior to U/S results. We demonstrate how this can be shortened by at least 20% using a nursing directive.

Cross-sectional study of factors associated with suicide ideation in Ontario adolescents

*Jonah Rakoff (1), Jesus Chavarria (2), Tara Elton-Marshall (2,3)

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(2) Institute for Mental Health Policy Research, Centre for Addiction and Mental Health, London, Ontario, Canada
(3) Department of Epidemiology and Biostatistics, Western University, London, Ontario, Canada

Background: Suicide is the second leading cause of death in Canadian adolescents. The Interpersonal Theory of Suicide attempts to explain suicide etiology and proposes that feelings of perceived burdensomeness or thwarted belongingness lead to suicide ideation, but this has not been extensively studied in adolescents.

Objective: The objective was to use the Interpersonal Theory of Suicide to examine factors that may be associated with suicide ideation in adolescents. The factors selected were school connectedness, perceived availability of support, self-esteem, feelings of worthlessness, feelings of hopelessness, bullying and cyberbullying victimization, substance use, and social media use.

Methods: Data were from the 2017 Ontario Student Drug Use and Health Survey, a survey of 7th to 12th graders enrolled in a publicly funded school in Ontario. Weighted logistic regression of suicide ideation on all exposure variables was conducted.

Results: Not knowing where to turn to for support (OR=2.06, 95%CI [1.5, 2.83]), feeling worthless (OR=10.18, 95%CI [5.35, 19.37]), having low self-esteem (OR=2.95, 95%CI [2.18, 3.99]), feeling hopeless (OR=2.65, 95%CI [1.05, 6.69], being bullied (OR=2.21, 95%CI [1.04, 4.69]), and using cannabis (OR=2.03, 95%CI [1.03, 3.97]) and alcohol (OR=1.97, 95%CI [1.24, 3.12]) were each associated with greater odds of suicide ideation.

Conclusions: This study supports the Interpersonal Theory of Suicide as an explanation of suicide etiology in adolescents as low self-esteem and feelings of worthlessness, two indicators of perceived burdensomeness, and not knowing where to turn to for support, an indicator of thwarted belongingness, were associated with greater odds of suicide ideation. Being bullied and using cannabis and alcohol may also contribute to suicide ideation through increased feelings of perceived burdensomeness and thwarted belongingness. These findings can help guide interventions aimed at reducing the burden of suicidality during adolescence and demonstrate the need to provide accessible mental health supports for youth in Ontario.

Virtual delivery of simulation education to undergraduate medical students during the COVID-19 pandemic

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Introduction: The COVID-19 pandemic has restricted the delivery of in-person clinical training sessions for undergraduate medical students. Concurrently, an increasing number of healthcare practices have adapted by shifting to virtual patient care. A promising tool to introduce learners to the virtual clinic environment is simulation-based teaching. MacSim is an innovative, student-led simulation workshop for medical students to develop clinical competencies.

Objective: The impacts of MacSim and student perspectives regarding simulation-based teaching during COVID-19 were assessed.

Methods: A comprehensive case, representative of a real virtual outpatient scenario, was delivered to 42 pre-clerkship medical students via video conferencing. In pairs, participants obtained a history, ordered labs and imaging via an interactive document, and implemented an assessment and plan for a simulated patient. Upon completion, feedback was delivered by physician adjudicators. Participants were surveyed before and after participating in MacSim and interviews were conducted with 12 randomly selected participants. Survey data was analyzed using the Wilcoxon signed-ranks test. Interview transcript data was qualitatively analyzed by two authors.

Results: After participating in MacSim, students (n=24) felt significantly more prepared to make clinical decisions, collaborate, and communicate with patients in a virtual clinic setting. 92% of respondents agreed that MacSim was a valuable learning experience and 96% agreed more simulation-based learning should be integrated into the curriculum. Themes that emerged in the qualitative analysis included 1) value of simulation fidelity, 2) value of physician feedback, and 3) effectiveness of MacSim in improving students' clinical skills in a virtual context.

Conclusion: This is the first study to characterize the value of a student-designed simulation workshop for teaching virtual care competencies in the COVID-19 era. These findings suggest the importance of integrating more simulation-based teaching into undergraduate medical curricula as virtual clinics will continue to play a prominent role in medical practice.

The use of tranexamic acid in urological surgeries: a systematic review

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Background: Tranexamic acid (TXA) is an antifibrinolytic agent widely used in trauma and surgery to decrease bleeding, and consequently, reduce the need for blood product transfusion. While application of TXA has been widely documented in many surgical specialties, the role of TXA in urological surgeries is not well summarized. We aimed to conduct a thorough systematic review of studies that report outcomes of TXA use in urological surgery.

Methods: A comprehensive search was conducted from the following databases: PubMed, Embase, Cochrane Library, and Web of Science. Two reviewers, independently and in duplicate, performed title/abstract screening, full text review, and data collection. Primary outcomes included estimated blood loss and blood transfusion rates. Secondary outcomes included TXA administration characteristics, peri-operative outcomes, and post-operative complications. Risk-of-bias for randomized-control studies was evaluated with the Cochrane tool, and the MINORS score was used for other comparative studies.

Results: A total of 15 studies, consisting of 2343 patients, were included in final analysis. These studies spanned several types of procedures – seven PCNL, four TURP, three prostatectomy, and one cystectomy. Initial findings suggest that, in the majority of included studies, estimated blood loss (p = <0.0001 – 0.05) and blood transfusion rates (p = <0.0001 – 0.05) were significantly reduced in TXA-receiving groups versus placebo. In most studies, peri-operative changes in hemoglobin, operative time, and incidence of post-operative complications were also found to be reduced in TXA-receiving groups.

Conclusions: Based on available evidence, TXA can be a useful and appropriate perioperative medication to reduce blood loss and transfusion rates in urological procedures. The findings of this review will provide evidence-based data for decision-making in urological surgery, and push for future comparative studies of TXA use in urological procedures.

Automated semantic-level annotation and indexing of bone marrow histopathology images using machine learning

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Background: The field of pathology is transitioning into the digital age, with high-resolution digital whole slide images (DWSI) replacing glass slides and microscopes. Digital pathology is pivotal in enabling machine learning (ML)-based computational pathology approaches to support pathologists. A major factor limiting the use of ML in hematopathology (blood and bone marrow) is the lack of a benchmark annotated DWSI dataset, which hampers comparisons of different ML methods in DWSI analysis tasks. Labelling DWSI to create a dataset that captures the rich histomorphological features within requires more hematopathologist time than is available.

Objective: We address this issue by using ML techniques to rapidly assign clinically relevant semantic diagnostic to DWSI bone marrow histopathology images.

Methods: Our dataset consists of >1000 DWSI images and their unstructured diagnostic comments. We divide the images into tiles and use K-means to cluster them into various histomorphologies of marrow tissue, bone, and fat, which are then annotated more specifically by a hematopathologist. On a parallel track, we use our existing natural language processing (NLP) model to derive clinically meaningful semantic descriptors from the paired unstructured diagnostic text, providing a realistic hierarchy of label complexity.

Results: By reducing millions of annotation tasks to fewer than 10 per slide, our approach provides a major reduction in the time needed for hematopathologist verification and annotation of the dataset.

Discussion: We will extend our approach by applying our published deep learning feature extraction and indexing technology, producing the first-ever large-scale, annotated, and semantically-searchable hematopathology dataset. This dataset will enable years of innovations in diagnostic hematopathology such as generative ML models for pathology image captioning.

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The Quality of Systematic Reviews and Meta-Analyses in Breast Reduction: A Systematic Review

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Background: Systematic reviews and meta-analyses sit at the top of the level-of-evidence pyramid, acting as the gold standard for clinical guidelines. Since breast reductions are commonly performed with a variety of complications, it is important to have high quality evidence available for consultation.

Objectives: This study seeks to investigate the quality of systematic reviews and meta-analyses that provide outcomes with a focus on breast reduction.

Study Selection: A comprehensive search of MEDLINE, Embase and the Cochrane Library of Systematic Reviews was performed. Systematic reviews and meta-analyses that are either focused on breast reduction or have a sub-group analysis tailored towards breast reduction, and were published in the top 15 plastic and reconstructive surgery journals were included.

Data Collection and Analysis: Quality assessment was performed using A Measurement Tool to Assess Systematic Reviews (AMSTAR). Study characteristics were extracted including journal, year of publication, country affiliation (corresponding author), primary focus on breast reduction, and number of studies included.

Main Results: There was a significant difference in AMSTAR score over time (p=0.0146, r=0.8110, 95% CI, 0.057 to 0.35), despite no significant difference in number of studies over time (p=0.3650, r=0.3715, 95% CI, -0.055 to 0.1287). No significant associations were identified between AMSTAR score and the number of included studies (p=0.1602, r=0.4326, 95% CI, -0.21 to 0.04). No differences were found between AMSTAR scores of studies with a primary focus on breast reduction compared to those that conducted a subgroup analysis (p=0.2857).

Conclusions: There is a progressive increase in AMSTAR adherence over time in studies surrounding breast reduction, indicating improved methodological quality. Further improvements in overall methodological quality are still required and an increase of reviews in the field would help bolster the pool of evidence available.

Thromboprophylactic strategies in patients with multiple myeloma on lenalidomide based therapies at the Walker Family Cancer Centre

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Lenalidomide is an immunomodulator that is commonly used in multiple myeloma (MM) treatment. Unfortunately, it is also associated with an increased frequency of thrombotic events, particularly when combined with dexamethasone. Consequently, it is common for patients with MM on lenalidomide treatment to be on thromboprophylaxis. At present there are no evidence-based universal guidelines on the appropriate way to prophylax MM patients on lenalidomide. The goal of this retrospective chart review was to (a) characterize the current anti-thrombotic prophylactic strategies used at the Walker Family Cancer Centre (WFCC), and (b) determine the incidence of thrombotic events amongst patients on lenalidomide therapy.

A retrospective chart review was conducted from June 2015 to June 2019. Eligible patients were older than 18 years and on combination lenalidomide therapy. Demographic data and occurrence of thrombotic events were collected from Meditech and Mosaiq.

Aspirin prophylaxis was used in 80.2 % of participants, whereas 3.9 % of participants were on LMWH, 9.9 % of participants were on DOACs and 1.9 % of participants were on warfarin. Thrombotic events occurred in 10.6 % of participants on aspirin, 16.7 % of participants on LMWH, 7 % of participants on DOACs and none of participants on warfarin. Mean time from initiation of lenalidomide treatment to thrombotic event was 377.5 days. Participants on doublet lenalidomide and dexamethasone developed thrombotic events at a rate of 16 % , the highest among all treatment regimens.

The results from this study suggest aspirin is the thromboprophylactic the agent of choice for MM patients receiving lenalidomide at the WFCC. Thrombotic risk was 10.5% and was highest amongst patients on doublet lenalidomide and dexamethasone. There was a trend toward decreased events in patients on DOAC therapy. Consequently, further study is required to explore whether other thromboprophylaxis strategies may be more effective than ASA at preventing thrombotic events.

Information flow between community pharmacists and primary care physicians: A scoping review

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Introduction: Communication is the foundation of collaboration between pharmacists and primary care physicians, especially to ensure safe medication use. No review regarding the clinical communication between these groups exists, despite the need to ensure these groups are communicating openly, effectively and efficiently.

Objective: To summarize the literature on communication about medication therapy issues between community pharmacists and primary care physicians who are not co-located.

Methods: The databases PubMed, EMBASE, Scopus, and International Pharmaceutical Abstracts were searched; studies that discussed communication about medication therapy between community pharmacists and primary care physicians who are not co-located were included. Sources were excluded if the extent of communication between the two providers was limited to technical tasks. Sources were screened by two reviewers for eligibility using COVIDENCE; conflicts were resolved through discussion. Data extraction and thematic analysis were completed by one reviewer, with consultation on code-generation by two others.

Results: The search identified 6549 articles, and after screening 42 were included for analysis. Major themes identified included: content of communication, process for communication, and communication as a form of collaboration. Telephones and fax machines were used most frequently for communication. The most commonly cited barrier to communication was the existence of a "gatekeeper" person between the pharmacist and physician. While pharmacists wanted to discuss clinical information like medication indications, prescribers wanted pharmacists to share information with them on their patients' medication adherence.

Discussion: This scoping review revealed that communication about medication therapy issues between community pharmacists and primary care physicians is generally initiated by the pharmacist and mostly via fax and telephone. This review supports future research to designing studies to evaluate the communication between these two providers and reduce barriers to ensure effective communication.

Assessment of Medical Student Perception of Chronic Pain-Centered Curricula in Undergraduate Medical Education at McMaster University

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Background: The Canadian Pain Task Force has highlighted the insufficiencies in pain curricula in undergraduate medical education (UGME). This is devastating considering that 1 in 5 Canadians suffer from chronic noncancer pain (CNCP) and 40-80% of patients with CNCP are misdiagnosed.

Objective: This study's objective is to quantify McMaster medical students' perception of CNCP learning opportunities and confidence in managing CNCP-related pathologies, in order to inform additions to the existing UGME curriculum.

Methods: A Google Forms survey was distributed through email and social media to 618 McMaster undergraduate medical students in all three years of training. Data were analyzed with descriptive statistics.

Results: 168 (27%) responses were collected from first (N=53), second (N=62), and third (N=53) year medical students. 140 (83%) students rated their satisfaction with the pre-clerkship CNCP curriculum as 3 or below on a scale ranging from 1 (None at all) to 5 (Very Satisfied). On average, first, second, and third year students rated their confidence in CNCP pathologies as 0.9, 2.6, and 3.1, respectively on a scale of 1 (Poor) to 7 (Excellent). Additionally, 96% of all students foresee interacting with patients with CNCP in their medical practices. When asked how CNCP education should be delivered, the majority of students preferred online modules (85%) compared to workshops (54%) or improving existing curriculum components (47%).

Conclusions: These results are highly indicative of the existing shortcomings in the current pain-specific McMaster UGME curriculum. Improvements to the curricula can be made by incorporating online modules to address topics such as stigmatization of patients with CNCP and virtual workshops to participate in interactive multi-disciplinary CNCP team experiences. By reproducing this survey in all 17 Canadian medical schools and improving UGME nationwide, future physicians will be better equipped to diagnose and manage patients with CNCP, and improve their health outcomes.

Impact of Rectus Diastasis Repair on Abdominal Strength and Function: A Systematic Review

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Background: Rectus diastasis plication performed during abdominoplasty aims to narrow the widened linea alba and return the rectus muscle bellies to their anatomic position. It is unclear whether plication improves abdominal strength and function.

Objective: This systematic review summarizes the effect of rectus plication on strength, function, and postoperative complications.

Methods: A comprehensive search of CINAHL, Embase, Medline and Web of Science was performed. Screening and data extraction were performed in duplicate. Data were extracted from the included articles, and outcomes were analyzed categorically.

Results: 497 patients from seven articles were included. Mean age was 44.5 years old (range 20.5-72) and 94.4% were female. Three articles reported abdominal strength measurements, with two showing significant improvement. Four articles used the SF-36 survey, all demonstrating improvement in physical function subscale postoperatively. An additional six instruments were used with to assess functional outcomes, of which four demonstrated significant improvement. The overall complication rate was 17.0%.

Conclusion: Rectus plication is commonly performed during abdominoplasty to improve form and function. While the literature to date is encouraging with respect to functional outcomes, improvements in abdominal strength are less consistent. Heterogeneity in patient population, outcome measures, and comparison groups limits the strength of our conclusions. Future research should include a large comparative study as well as a protocol for standardizing outcomes in this population.

POSTER PRESENTATIONS

COVID AND PATIENT CARE

Enhancing patient and provider communication during COVID-19: a program evaluation of Frontline Connect Canada

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Background: The SARS-CoV-2 pandemic has led to reduced in-hospital visitation and increased isolation. In these situations, virtual communication tools can facilitate interaction between patients, families, and care providers. The Frontline Connect Canada program aimed to close this communication and care gap by providing cellular devices to hospital staff to enable patient connections.

Objective: Identify areas of improvement for the Frontline Connect program by: (a) evaluating its effect on communication needs, user experience, and satisfaction and (b) identifying barriers to device access or use.

Methods: We administered pre-implementation needs assessment, user experience, and post-implementation surveys to healthcare staff at two pilot hospital sites in Ontario. User experience surveys were administered immediately on-site after device use. Recruitment was done through email lists and site champions using convenience sampling. We descriptively analyzed survey responses and completed a thematic analysis of open-text response questions.

Results: We received 139 needs assessment, 31 user experience, and 40 post-implementation survey responses. Most device use occurred in the emergency department and ICU by social workers, nurses, and physicians. Initial concerns prior to program implementation included infection control, data security, and device privacy. In the post-implementation survey, these were replaced by concerns like internet connectivity, the time-consuming setup, and staff reluctance. In the user experience survey, device utility and ease-of-use were rated 9.8/10 and 9.6/10 respectively, though overall experience was rated 7.2/10 in the post-implementation survey. Respondents viewed devices as useful and usable, but improved training and promotion could improve adoption.

Conclusions: Virtual care technology can improve patient care and communication among providers, patients, and families, but there are organizational and logistical factors that must be considered. This work lays the foundation for improving, standardizing, and sustaining virtual communication programs in hospitals.

Evaluation of a student-older adult telephone befriending program to reduce social isolation during the COVID-19 pandemic: A pilot quality assurance study

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Background: Social isolation and loneliness are associated with many adverse health outcomes. The COVID-19 pandemic has increased this risk and disproportionately affected older adults, particularly those living alone with frailty and limited supports. The McMaster Phone-a-Friend Program (PFP) was established from the UofT SSIPP initiative, with the goal of reducing social isolation through telephone befriending. This study's goal is to evaluate the effectiveness of the program in reducing social isolation and explore its long-term sustainability after the pandemic.

Methods: Older adults at risk for social isolation, living in the community and retirement homes in Hamilton, Waterloo and Niagara regions, were referred to the program by healthcare providers. They were subsequently matched to trained student volunteers who provided social interaction through weekly telephone calls. Older adults who completed ≥4 calls were to invited to provide demographic information, respond to open-ended questions, and complete an 8-item self-report questionnaire with responses ranging from "Strongly Agree" to "Strongly Disagree" over the telephone to determine the program's impact.

Results: To date, PFP has matched 83 older adults and student volunteers. Twenty-seven older adults (mean age 74 years; 73% female; 74% living alone; 74% community-dwelling) participated in the survey. The majority of participants "Agreed" or "Strongly Agreed" that the program made them feel less lonely (78%), improved their quality of life (70%) and that they would continue participating in the program after the pandemic (74%). Qualitative feedback suggests potential areas for program enhancement include options for self-referrals, call schedule flexibility and more interactive means of communication, such as videoconferencing.

Discussion: Student-led telephone befriending programs appear to be an effective, sustainable and generalizable method of reducing participant-reported social isolation and loneliness, after at least one month of participation during the pandemic.

Conclusion: Telephone-befriending programs are a feasible and safe intervention to combat social isolation during the pandemic.

The effect of the COVID-19 pandemic on stroke management: patient outcomes and recommendations for care

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The COVID-19 pandemic fundamentally disrupted all elements of stroke care. Fewer patients pursued emergency assessment, strokes were recognized less frequently by providers, and time from hospital presentation to treatment increased. Admission to stroke units and inpatient rehabilitation units fell, due to reduced capacity and staff redistribution. Patients with comorbid stroke and COVID-19 received only 62% of the rehabilitation time as those without COVID-19. Finally, outpatient rehabilitation predominantly shifted to telerehabilitation, which has mixed evidence regarding its efficacy. Literature on COVID-19 related disruptions to stroke care strongly suggests that patients receiving treatment during the pandemic may experience poor long-term outcomes. Primary recommendations include: (1) An awareness campaign on signs, symptoms, and acuity of stroke, as well as the importance of seeking care despite the pandemic, (2) Developing comprehensive protocols to quickly recognize stroke in the ambulance and emergency department while following COVID-19 safety measures, (3) Providing acute stroke care in stroke units wherever possible and educating non-stroke specialists on the tenets of quality stroke care where not possible, (4) Ensuring that all stroke patients, especially those with COVID-19, receive sufficient access to quality rehabilitation, (5) Providing technological education to patients and providers to facilitate telerehabilitation use.

Nudging interventions to combat vaccine hesitancy: protocol for a rapid review

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Background: Despite the efficacy of vaccines to prevent infectious diseases, vaccine hesitancy is a common and increasing public health problem internationally. In 2019-2020, for example, the Canadian influenza vaccination rate was only 42%. In the context of the current COVID-19 pandemic, finding effective interventions against vaccine hesitancy is of even greater urgency and importance. Early surveys suggest that only 68.7-80% of Canadians may be agreeable to vaccination and this poses a potential risk to the successful development of herd immunity. Nudging interventions use behavioural theory to design choice architecture to predictably influence the outcome without restricting choice and have previously been used to improve healthcare delivery. However, their effectiveness for decreasing vaccine hesitancy is unclear.

Objectives: In this rapid review, we aim to determine if nudging interventions are effective in increasing actual or intended vaccination rates.

Methods: We searched MEDLINE, EMBASE, and PsycINFO from inception to March 2021 for Randomized Controlled Trials investigating the impacts of nudging interventions on actual and intended vaccination rates. Reviewers in duplicate will perform citation screening and full-text review. Eligibility will be determined using a pre-developed decision tree for identifying nudges. Conflicts will be resolved by discussion or a third reviewer. Data abstraction and risk of bias assessment will be conducted using standardized forms and the Cochrane Risk of Bias tool respectively. Results will be synthesized descriptively and if the studies are deemed methodologically, clinically and statistically similar, meta-analysis will be conducted using a random effects model. The quality of evidence will be assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.

Discussion: We will attempt to determine whether nudging is an effective strategy to improve vaccination rates, providing public health initiatives with evidence on whether nudging could be applied to combat vaccine hesitancy for influenza, SARS-CoV-2 and other vaccine-preventable viruses.

CARDIOVASCULAR HEALTH

Sodium-glucose co-transporter inhibitors and atrial fibrillation: a systematic review and meta-analysis of randomized controlled trials

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Introduction To determine whether sodium-glucose co-transporter (SGLT) inhibitors reduce atrial fibrillation/flutter (AF) and whether a history of AF modifies the effect of SGLT inhibitors on the composite of heart failure (HF) hospitalization or cardiovascular death.

Methods We searched MEDLINE, Embase and CENTRAL to March 2021. Pairs of reviewers identified randomized controlled trials that compared an SGLT inhibitor to placebo or no therapy. The primary outcome was the rate of AF reported as an adverse event. The secondary outcome was a composite of hospitalization/urgent visit for HF or cardiovascular death, stratified by history of AF at baseline. We assessed risk of bias using the Cochrane tool and the overall quality of evidence using GRADE.

Results Thirty eligible trials reported on AF events (71,553 participants, mean age 62 years, 35.6% women). Moderate quality evidence supported a lower risk of AF events with SGLT inhibitors (1.8% versus 2.4%; risk ratio 0.82; 95% confidence interval [CI] 0.74-0.91; I2=0%). Three trials reported on the secondary composite outcome (18,826 participants, mean age 66 years, 38.1% women). In patients with a history of AF, SGLT inhibitors resulted in a lower risk in the composite of HF hospitalization or cardiovascular death (hazard ratio [HR] 0.70; 95% CI 0.57-0.85; I2=0%) – similar to the effect estimate for patients without AF (HR 0.70; 95% CI 0.61-0.79; I2=0%), p-value for interaction: 1.00.

Conclusions SGLT inhibitors may reduce the incidence or recurrence of AF. These drugs reduce a composite of HF hospitalization or cardiovascular death, both in patients with and without AF.

Feasibility study of a handheld ultrasound and needle guide device for training diverse providers to perform Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) in a clinical simulation program

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Background: Vascular injury with hemorrhage is the second leading cause of potentially preventable death in civilian and military trauma patients. Management of bleeding from within the torso cannot be controlled with direct pressure and is referred to as non-compressible torso hemorrhage (NCTH). Resuscitative endovascular balloon occlusion of the aorta (REBOA) is a technique where a balloon is advanced into the aorta and inflated to obstruct forward flow as an emergent temporizing measure of NCTH.

Objective: This research proposal aims to identify methods in which REBOA can be simplified for use by inexperienced providers, such as through hand-held ultrasound and needle-guide devices, and examine the efficacy of a Canadian-based REBOA clinical simulation educational program.

Methods: The clinical simulation will have participants complete all steps of REBOA placement with a REBOA kit, REBOA training model, a hand-held or conventional ultrasound, and a needle guide device. Performance rating will be done by two independent raters by consensus using a standardized 7-item global rating scale via a video recording of the simulation. Pre- and post-simulation surveys will be administered to the participants on a 5-point Likert scale with questions on satisfaction, procedural confidence, and a pre- and post-knowledge test. Data analysis will involve descriptive statistics and simple linear regression.

Results: We anticipate that the use of a hand-held ultrasound with a needle guide device, when used by inexperienced providers for a REBOA clinical simulation program, will have comparable efficacy and improved accuracy to conventional ultrasound technique and that participants will report improved post-simulation procedural confidence, knowledge, and satisfaction.

Conclusion: REBOA is a potentially life-saving intervention for the management of NCTH. A clinical simulation education program can train providers on its use and identify how to simplify the process for inexperienced providers.

Outcomes of balloon aortic valvuloplasty versus surgical repair in congenital aortic stenosis: A systematic review and meta-analysis

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BACKGROUND/OBJECTIVE: Aortic valve stenosis (AS) comprises approximately 10% of all cases of congenital heart disease, and the clinical presentation of critical congenital AS in the pediatric population can be complex. Palliative treatment involves two main interventions: balloon aortic valvuloplasty (BAV) or surgical aortic valvotomy (SAV). Historically, the selection of interventions has been dependent on individual or institutional preferences. Thus, we sought to perform a systematic review and meta-analysis to determine the effects of BAV or SAV on patient morbidity and mortality.

METHODS: We searched MEDLINE and EMBASE from inception to March 2021 for studies comparing BAV versus SAV for critical congenital AS in patients younger than age 18. We performed title and abstract screening, full-text review, risk of bias assessment using the CLARITY tool, and data collection independently and in duplicate. We pooled data using random-effects model and the Mantel-Haenszel statistical method, and evaluated the overall quality of evidence using the GRADE framework.

RESULTS: 12 studies (n=1216) were included that compared outcomes for BAV and SAV in the pediatric population. Comparison of mortality at 30-day and at longest follow-up was not statistically significant between the two groups (RR 0.87, 95% CI [0.46 – 1.63] and 0.71, 95% CI [0.26 – 1.98], respectively). The reintervention rate favoured surgical repair at longest follow-up but did not reach statistical significance (RR 1.13, 95% CI [0.95 – 1.36]). Postprocedural AI was more common after BAV but failed to reach statistical significance (RR: 1.5, 95% CI [0.99 – 2.99]).

DISCUSSION/CONCLUSION: In pediatric patients with congenital AS, SAV did not offer additional advantages over BAV. There was a trend toward increased post-procedural AI and increased rate of reintervention with BAV. The quality of evidence is very low; thus, an appropriately powered large study is required to adequately address the risks and benefits of these two interventions.

Analysis of QTc prolongation in adolescents with anorexia nervosa taking psychotropic drugs

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Objective: Anorexia nervosa (AN) is a psychiatric disorder often encountered in pediatric populations. Studies show that AN patients have longer QTc intervals compared to matched controls, increasing the risk of sudden cardiac death. However, AN is often treated with psychotropic drugs which are associated with QTc prolongation. This study aims to investigate whether the presence of AN alone is associated with greater incidence of QTc prolongation than the general population (8.7%, Montanez et al., 2004), and determine the impact of electrolyte abnormalities and psychotropic drugs.

Methods: Retrospective data was obtained for 300 patients with AN between the ages of 7-17 presenting to the McMaster Children's Hospital. QTc was defined as normal (<440ms), borderline prolonged (between 440-460ms), and prolonged (>460ms).

Results: Incidence of QTc prolongation among AN patients without electrolyte abnormalities or psychotropic drugs (13.48%) is not significantly different from the general population (p=0.19). However, AN patients with electrolyte abnormalities and/or taking psychotropic drugs are significantly more likely to have QTc prolongation (22.4%, p<0.05). Chi-squared analysis shows that QTc >440ms is dependent on taking psychotropic drugs ($\chi 2$ = 11.846, p<0.001). Follow-up T-test with Welch approximation shows that those taking psychotropic drugs have a significantly higher incidence of QTc prolongation (p<0.05).

Conclusion: AN patients using psychotropic drugs and/or with electrolyte abnormalities are significantly more likely to have QTc prolongation, but the presence of AN alone is insufficient for predicting QTc prolongation. Further AN studies should investigate the relationship between electrolyte imbalances and QTc prolongation in the absence of psychotropic drugs.

Management of acute ischemic stroke in cancer patients

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Background: Clear treatment strategies for cancer-associated thrombotic events including ischemic stroke have not been established and the impact of cancer on stroke management and post-stroke outcomes is not well characterized. This study was therefore designed to compare medical therapies, procedural interventions, discharge duration and status for acute ischemic stroke in patients with and without active cancers.

Methods: This retrospective study evaluated baseline characteristics and hospital mortality of adult patients in two Hamilton, ON hospitals with a diagnosis of acute ischemic stroke (June 28 -September 28, 2018). Continuous variables were summarized using mean and standard deviation or median and interquartile range. Categorical variables were summarized using counts and proportions and were compared using Chi-Square testing.

Results: The study included 206 patients with 17 patients having active cancer. No statistically significant difference was found in the proportion of non-cancer and cancer patients who received IV thrombolysis (18.5% vs. 11.8%, P <0.487) or mechanical thrombectomy (13.8% vs. 5.9%, P < 0.357). Similar proportions of non-cancer and cancer patients were treated with anticoagulants (84.1% vs. 88.2%, P < 0.654) and antiplatelets (81% vs. 82.4%, P < 0.888). A higher proportion of non-cancer patients were treated with antihypertensives (86.8% vs. 64.7%, P < 0.015) and cholesterol lowering agents (86.2% vs. 64.7%, P < 0.019).

Conclusions: As only 8% of patients had concomitant acute ischemic stroke and active cancer, the study was likely underpowered to detect differences between cohorts. A clinical, but not statistically significant difference in the proportion of cancer patients receiving thrombolysis/thrombectomy was noted and fewer cancer patients were treated with anti- hypertensives and cholesterol medications. We will continue data collection and further explore differences in baseline characteristics and treatments in patients with and without cancer.

ORTHOPEDICS

The acute impact of the COVID-19 pandemic on patients presenting with orthopaedic injuries across a Canadian academic, orthopaedic trauma system: a multi-centre, pre-post observational cohort study.

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Purpose: The purpose of this study was to examine the acute impact of the COVID-19 pandemic on urgent or emergent orthopaedic presentations in a high-volume, academic health-care system.

Methods: A multi-centre observational analysis was conducted across four major teaching hospitals. Four time periods were analyzed, including the first 30 days of the Province of Ontario's state of emergency, March 17-April 15, 2020 (Period 4), and the 30 days prior (Period 3). These were compared to two matching corresponding time periods from the previous calendar year (Periods 1 and 2).

Results: 1240 patient consultations were analyzed, of whom 49.8% were female and the mean age was 56.0 ± 27.9 years. During the acute pandemic period, there were 228 total consultations, a 31.3% decrease from the same period in the previous year (p=0.0001). Significant decreases were seen in consultations per day with respect to single extremity trauma (3.13 ± 1.74 vs 4.97 ± 1.94) and postoperative complications (0.47 ± 0.63 vs 1.47 ± 1.38), while there was no significant difference in the rate of referrals for hip fractures, multiple extremity trauma, or infectious processes. While the rate of injuries associated with MVCs remained stable, a greater proportion were caused by falls from standing (50.6% vs 41.9%), and much fewer were from recreational activities (3.0% vs 9.0%).

Conclusion: The COVID-19 pandemic acutely resulted in a decrease in the overall number of orthopaedic referrals, due mostly to a decrease in post-operative complications and single extremity injuries. Rates of referrals for high-energy, multisystem traumatic injuries (ie. MVCs), hip fractures and infectious processes remained stable. This initial analysis indicates that provision of resources to manage urgent and emergent musculoskeletal injuries needs to continue to be prioritized, as complex musculoskeletal injuries including polytraumas, hip fractures and bone and joint infections will continue to place a relentless burden on our health-care system.

The relationship between neck strength and concussion risk: does concussion risk differ across head impact location for female ice hockey players?

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Background: In the last 15 years, female participation in ice hockey has increased by over 900% and has been mirrored by an increase in injuries. Despite rules that prohibit intentional body contact, experiencing less impacts, lower magnitude impacts and fewer athletic exposures, female hockey players are at greater risk of suffering a concussion than males. Neck strength has been proposed as a risk factor that might predispose females to concussions, however research is inconclusive. This study is the first to use female hockey player neck strength data on a surrogate neckform to simulate head impacts using a horizontal impactor.

Objective: The purpose of this study was to examine the relationship between neck strength and linear acceleration and risk of injury during a 3.61 m/s impact to the front, side and rear locations for female hockey players. Method: Using a correlational design, a NOCSAE headform mounted to a neckform designed to represent participants' neck strength was impacted using a horizontal linear impactor. Pearson correlations and repeated measures ANOVAs were used to address the research purpose.

Results: Neck strength was not correlated with linear acceleration and risk of injury across locations. For linear acceleration, the front (r= .62, p<.05) and side (r=.73, p<.05) locations correlated with the rear. For risk of injury, the front (r= .62, p<.05) location correlated with the rear. A significant main effect of impact location on linear acceleration $F(2,22)=32.82$, p<.05, $\eta2=.76$ and risk of injury $F(2,22)=50.78$, p<.05, $\eta2=.82$ were found. Conclusion: The results suggest that neck strength does not mitigate linear acceleration and risk of injury during impacts. Further research in this area needs to be conducted and should include varying speeds and angular acceleration to properly assess the effect of neck strength on concussion mitigation. The validity of the neckform used should also be reassessed.

Clinical Outcomes and Surgical Satisfaction Following a Lateral Transfibular Total Ankle Arthroplasty: Early Follow-up Results from A Canadian Cohort

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Background: In pandemics such as COVID-19, shortages of personal protective equipment are common. One solution may be to decontaminate equipment such as facemasks for reuse.

Background: The lateral transfibular total ankle arthroplasty (TAA) is a novel surgical technique used for treatment of end-stage osteoarthritis. The purpose of this study was to evaluate perioperative clinical outcomes, surgical satisfaction and complications undergoing this procedure. Methods: This is a retrospective cohort study of 25 patients undergoing a TAA via the lateral transfibular approach. Clinical data collection was performed preoperatively and postoperatively at 3 and 12 months using the AOFAS, the SF-36 and the VAS for pain. Surgical satisfaction was evaluated using a modified version of the 8-item Surgical Satisfaction Questionnaire (SSQ-8).

Results: Overall AOFAS scores increased from 30.32 preoperatively to 85.32 ($p<.001$) at 3 months and 87.64 ($p<.001$) at 12 months. Patient SF-36 scores showed statistically significant increases across all domains (pain, physical, emotional, social) preoperatively to 3 and 12 months postoperatively. Additionally, VAS scores increased from 8.0 preoperatively to 1.7 ($p<.001$) at 3 months and 1.5 ($p<.001$) at 12 months postoperatively. Twenty-three patients (92.0%) reported that they were "very satisfied" or "satisfied" with the outcome of their procedure, that they would "do it all over again", and that they would recommend it to other patients with a similar condition.

Conclusion: Early results show that the lateral transfibular approach to TAA has good clinical outcomes at 3-month and 12-month follow up, with the greatest improvement measured in the first 3 months. Additionally, the surgery was associated with good patient satisfaction.

Rehabilitation outcomes following major lower limb amputation in the oldest old: A systematic review

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Background: Population ageing is a phenomenon experienced by many countries worldwide and the oldest old age group (≥80 years) is the fastest growing segment of the populace. As the population grows older and the burden of chronic disease increases, many individuals will undergo major lower limb amputation (LLA) at advanced ages. However, there is a scarcity of literature focusing on the outcomes of rehabilitation for people 80 years of age and older who acquire LLA.

Objective: To determine the scope of empirical evidence regarding prosthetic rehabilitation for newly acquired lower limb amputation in the oldest old (≥80 years of age).

Methods: The databases CINAHL, EMBASE, MEDLINE and Scopus were searched from inception through June 6, 2020. PROSPERO#: CRD42020188623. Two authors independently reviewed all titles and abstracts for inclusion. Consensus was required for articles to be included in the final analysis. Inclusion criteria: LLA of any etiology at the transtibial level or above, individuals ≥80 years of age at the time of amputation and had rehabilitation outcomes reported.

Results: Of 11,738 articles identified from databases, 117 underwent full-text review and 10 met inclusion criteria. Multiple rehabilitation outcomes were assessed by the selected studies, including mortality, prosthesis use and functional abilities. Individuals ≥80 years of age were able to successfully use a prosthesis, be discharged home and perform activities independently or with support. However, increased age was negatively associated with prosthesis fitting and rehabilitation success was not uniform in some participants.

Conclusion: Age alone should not disqualify individuals from assessment or participation in an amputee rehabilitation program. The oldest old who acquire major LLA can be successful in prosthetic rehabilitation, however they also face several challenges during the time. More research is needed to better understand the unique requirements for rehabilitation in this population of individuals with LLA.

Imaging for management and assessment following traumatic dislocation of the patella: a systematic review

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Introduction/Background: To investigate the use and indications of MRI and other imaging modalities in the management and assessment of traumatic patellar dislocations.

Hypothesis/Question/Objective: This review will describe the imaging guidelines for patients who have experienced a traumatic patellar dislocation. We hope to answer the following questions: which patients undergo an MRI following traumatic patellar dislocation? What are there indications for an MRI (e.g. loose bodies)? What happens with the loose bodies? Are they fixed or removed? How do patients recover following these procedures?

Methods: Four databases (PubMed, MEDLINE, EMBASE, Web of Science) were searched for literature from January 1st, 2000 until February 26th, 2021 by two reviewers independently. Systematic electronic search yielded 2421 articles. Inclusion criteria were English-language studies investigating traumatic patellar dislocation on humans of all ages. Conference papers, abstracts, book chapters, review articles, case reports/case series with fewer than five participants, and technical reports were excluded.

Results: 77 articles are being reviewed in a full article screening process to identify relevant material for the synthesis of the final systematic review.

Discussion/Conclusions: Patellar dislocation accounts for approximately 2-3% of knee injuries, occuring in 5.8-29 per 10,000 in the adolescent population. The current literature outlining management indications for imaging varies widely and a consistent standard of care is not overtly present in the data. Imaging following patellar dislocation can yield important data regarding the extent of the injury, structures involved, and guide management of the injury. This can affect the overall outcome of treatment, the range of motion retained following the injury, and return to daily activities, impacting quality of life. This review will present an overview on current guidelines for imaging following traumatic patellar dislocation, identifying clear indications for the type of imaging and any benefits or limitations associated with imaging.

PEDIATRICS

Incidence, presentation, and differentiation of variants of pediatric autoimmune encephalitis in Hamilton, Ontario

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Autoimmune Encephalitis (AE) is an emerging cause of pediatric epilepsy with numerous variants, including anti NMDA-receptor encephalitis, for which there is a detectable antibody. However, it is believed that there are many variants of AE for which an antibody has not yet been discovered. This study aimed to determine the differences in disease course and clinical management of pediatric AE patients with and without detectable anti-NMDA receptor antibodies. This retrospective analysis is part of a Canada-wide project aimed at evaluating the epidemiology and characteristics of AE. Pediatric cases with suspected AE presenting to McMaster University Medical Centre were retrieved and screened by two independent reviewers against criteria. Those which met criteria were analyzed for trends and stratified into NMDA receptor antibody positive (NMDAr) and negative categories for inter-group analysis. Of 23 cases reviewed, 11 met criteria (aged 1-17 years, 27% males), of which 7 were NMDAr positive. The NMDAr subgroup was characterized by behavioural changes, focal seizures, and prodromal fever on presentation, whereas the receptor negative subset had a much higher variability of symptoms, without any distinctive patterns. On average, the NMDAr positive group showed an increase in white blood cell count on CSF analysis, and a slight increase in the proportion of patients presenting with supratentorial lesions on MRI. However, despite the lack of gross differences in findings, all of the NMDAr positive cases received IVIG, while only 2 NMDAr negative patients received immunomodulatory therapy. Our findings show that a high index of suspicion in the diagnosis of AE in pediatric patients is required due to the indistinct distribution and variety in its presentation among those without NDMAr antibodies. Future studies should explore why differences in treatment between the two groups exist, and if slight differences in presentation influence clinical decision making.

Effects of hydroxychloroquine and chloroquine on the QTc interval in children

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Background: Hydroxychloroquine and chloroquine are drugs with a long history of therapeutic use in treating both rheumatologic and infectious diseases. However, the cardiotoxic potential of therapy with these medications, particularly in children, remains a noted concern. Thus, the primary objective of this review is to identify whether treatment with hydroxychloroquine or chloroquine results in clinically meaningful QTc prolongation and increased risk of arrhythmia in comparison to baseline risk in the pediatric population.

Methods: A systematic search of PubMed, Embase, and the Cochrane Central Register of Controlled Trials was conducted, from inception through August 2020. Screening was conducted by 2 reviewers, and consensus was reached on the shortlisted articles.

Results: Eight studies of relevance in pediatric populations were identified through the literature search process. Out of the combined 65 children from the four included chloroquine studies with normal pre-treatment QTc intervals, 13 (20%) experienced clinically defined QTc prolongation (i.e., > 440-500 ms). Of the combined 56 patients who were administered hydroxychloroquine across four studies, 5 (8.9%) patients experienced clinically defined QT or QTc prolongation. Such effects were found to be most prominent in the initial days of treatment (i.e. days 1-4).

Conclusions: While QTc prolongation was reported in the majority of studies analysed, the isolated medication effect is difficult to establish in the absence of placebo arms and randomisation procedures. Although hydroxychloroquine and chloroquine may prolong the QT interval in children, there is little evidence to suggest that it commonly prolongs it to a clinically relevant or arrhythmogenic degree with short-term treatment.

Validation of PAS & pARC in Pediatric Appendicitis

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Appendicitis is the most common cause of surgical emergency in pediatrics. To determine a patient's risk of appendicitis, clinical decision rules such as the Pediatric Appendicitis Score (PAS) and pediatric Appendicitis Risk Calculator (pARC) are used to guide the need for diagnostic imaging. Our study aims to evaluate the performance of the PAS and pARC in a pediatric ED in patients with suspected appendicitis. We calculated the PAS and pARC scores for each eligible patient and compared the receiver operator characteristic (ROC) curves of the PAS and pARC. We screened 2400 patient charts and 220 (9.2%) patients were eligible with a mean age of 11 years (SD 3.9). Appendicitis was confirmed in 66 patients (30%). A total of 72 (32.7%) were categorized as low risk (score <4) on the PAS. Of those, 9 (12.5%) had appendicitis. As for the risk of appendicitis on the pARC score, 92 (42%) patients had very low (<5%) or low predicted risk (5-14%), 46 (50%) patients had intermediate risk (15-84%), and 6 (2.7%) patients had high risk of >85%. In the very-low and low-risk groups, 10% and 13% of patients had appendicitis, respectively. The area under the receiver operating characteristic curve was 0.79 (95% confidence interval [CI] 0.72, 0.86)) for the pARC compared with 0.73 (95% CI 0.66, 0.80) for PAS. The pARC score may outperform PAS in ruling out appendicitis, however a larger sample size is needed to determine the prognostic characteristics of those two clinical decision rules in a Canadian center.

Variation in interpretation of 24-hr ambulatory blood pressure monitoring in children with confirmed or suspected hypertension by Canadian pediatric nephrologists and cardiologists

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Background: Office-based blood pressure (BP) measurements are performed during a single visit and are limited by observer bias, white coat effect, rounding measurements, and inability to measure nocturnal BP or detect masked hypertension. Ambulatory BP monitoring (ABPM) is a 24-hour BP assessment and is the only way to detect masked hypertension. ABPM reflects more accurate BP measurements. However, despite consensus guidelines, it is unclear how physicians interpret ABPM and make management decisions. This study's objective is to investigate variation in pediatric ABPM interpretation and subsequent management decisions among Canadian pediatric nephrologists and cardiologists.

Methods: The survey was emailed to Canadian pediatric nephrologists and cardiologists. The survey content included baseline demographics of physicians, and questions on ABPM use, indications, interpretation, and subsequent management.

Results: Sixty-nine physicians participated in the survey: 46.4% pediatric nephrologists (n=32) and 53.6% pediatric cardiologists (n=37). Most respondents were 45-54 years old (37.7%), were practising for at least 11 years (65.2%), and trained in Canada (69.6%). Only 49.3% had ABPM interpretation guidelines at their practice. Most pediatric nephrologists would alter treatment in isolated systolic hypertension (80.3%) or isolated daytime hypertension (76.9%). However, only around 50% would alter treatment among children with either isolated diastolic hypertension (51.4%), elevated BP load >50% with normal mean BP (58.2%), or isolated nighttime hypertension (58.2%), suggesting significant variation in practice. Responses were similar among pediatric cardiologists. Even for the same ABPM results, e.g. isolated systolic hypertension, the decision to start or alter treatment depended on the medical condition (e.g. 92.3% for kidney transplant patients vs. 65.4% for congenital heart disease patients).

Conclusion: There is substantial variation in ABPM interpretation and subsequent management choices among Canadian pediatric nephrologists and cardiologists. Following existing guidelines, having a protocolized approach, and more research on BP patterns and prognosis may help to standardize practice.

Topical corticosteroid (TCS) phobia in parents of children with eczema: a scoping review

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Despite being first line treatment for pediatric atopic dermatitis (AD), topical corticosteroids (TCS) lack significant medication compliance due to decreased trust and "corticophobia" from parents/caregivers. Fears such as undesirable side effects like skin atrophy, the disputed risk of 'red man syndrome' post-discontinuation, and Internet sources pushing for more natural remedies all play into corticophobia prevalence and mismanagement of AD.

This scoping review examined 11 studies from all over the world regarding factors contributing to corticophobia, and analyzed potential courses of action to address corticophobia.

An overwhelming majority of those studies advocated for increased patient education from health professionals to dispel misinformation, and stated the value of available non-steroidal eczema medication options to provide alternatives that prioritized patient care regardless of counselling outcomes. The current dearth of peer-reviewed studies analyzing iatrogenic effects of long-term TCS usage and addressing claims of steroidal withdrawal or red man's syndrome also are a factor in the prevalence of corticophobia-facilitating online anecdotal reports. Cultural factors such as a mistrust in Western medicine - especially in Asian countries where TCS phobia has been noted disproportionately in the literature review - may contribute to misunderstandings and mistrust. Approaching TCS phobia in a collaborative, open manner acknowledging caregiver fears and explaining the alternate information sources is essential for patient education and medication adherence.

HEALTH IMPROVEMENT

Creating the ideal artificial intelligence platform: a review of medical imaging datasets

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Background: With the advent of artificial intelligence (AI), we are experiencing the most transformational revolution in medical imaging. However, Hamilton Health Sciences (HHS) researchers have no means to efficiently extract and analyze the medical images they need for projects.

Objective: To develop an HHS database of high-quality curated medical images, it is crucial to characterize and identify gaps in existing imaging datasets. This involves understanding their properties, including the volume of imaging data, anonymization, labelling, and curation such as associated metadata.

Methods: A systematic search of medical, engineering, and computer science literature databases, including Web of Science and Scopus, and of grey literature was conducted to identify articles on medical image datasets. From each article, characteristics of existing medical image datasets were extracted.

Results: 145 open radiology imaging datasets were identified. Imaging modalities included CT (37.2%), MRI (29.1%), and radiographs (19.8%). Areas of the body represented included chest (38.9%), head (24.1%), and abdomen (11.1%). There was significant variation in volume of imaging among datasets, ranging from 34 to 377,110 images. All of the datasets were anonymized. The majority of the datasets were labelled with the presence or absence of disease (52.9%) while some (35.3%) had additional metadata including the location of the positive finding, patient age and gender, and image quality. The majority of datasets (94%) were sourced from the United States of America.

Conclusions: There is a need for more curated imaging datasets to better inform algorithm development, particularly outside of the USA. The largest dataset found in the literature was 377,110 images, whereas HHS expects to have over a million images in their dataset. The results from this review verify that the HHS imaging database will offer unique value to researchers nationally and internationally.

Stem cell therapy for heart failure: Medical breakthrough, or dead end?

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Background: Heart failure continues to be one of the leading causes of morbidity and mortality worldwide. Myocardial infarction is the primary causative agent of chronic heart failure resulting in cardiomyocyte necrosis and the subsequent formation of fibrotic scar tissue. Current pharmacological and non-pharmacological therapies focus on managing symptoms of heart failure yet remain unable to reverse the underlying pathology. As a result, heart failure carries a poor prognosis and high mortality rate.

Objective: As the heart lacks significant endogenous regeneration potential, we wish to evaluate whether stem cells are a feasible therapeutic approach in treating heart failure as they possess the ability to self-renew and differentiate into multiple cell lineages and tissues.

Methods: A literature review was conducted using PubMed (MEDLINE) as the sole database, as per the World Journal of Stem Cells author guidelines. Inclusion criteria were English-language clinical trials investigating the use of various types of stem cells to treat heart failure in human subjects. Pluripotent stem cells (ESCs and iPSCs) and adult stem cells (BMDSCs, MSCs, CSCs and SMs) were included.

Results: Preclinical and clinical studies have shown a wide spectrum of outcomes when applying stem cells to improve cardiac function. This may reflect the infancy of clinical trials and the limited knowledge on the optimal cell type, dosing, route of administration, patient parameters and other important variables that contribute to successful stem cell therapy. Nonetheless, several positive results were reported from clinical trials, including demonstrations of positive safety profiles in ESCs, CSCs, MSCs and BMDSCs.

Conclusions: The field of stem cell therapeutics continues to advance at unprecedented rates. Though larger studies are warranted to confirm the true efficacy of stem cells, we remain cautiously optimistic that they will play a role in the treatment of heart failure in the years to come.

Impact of health enhancement activities on quality of life in patients with age-related vision loss: A systematic review

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Background: Vision loss is associated with a significant burden of disease for patients and their caregivers. The impacts of vision loss expand into all areas of functioning, decreasing quality of life (QOL). Health enhancement activities, such as leisure, diet, exercise, and meditation may improve QOL for these patients.

Objective: To assess the relationship between health enhancement activities and quality of life in individuals with age-related vision loss.

Methods: A comprehensive literature search of The Association for Research in Vision and Ophthalmology (ARVO), The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Embase, Medline, PsycInfo, and Web of Science was conducted. Search terms included exercise, meditation, diet, and leisure, combined with terms relating to vision loss. Eligible studies underwent risk of bias assessment using CLARITY Group's Tools to Assess Risk of Bias.

Results: Eight studies were included in the review, with three reporting on exercise, two on meditation, two on leisure, and one on a multidisciplinary approach. These studies included a total of 3,571 patients, with a mean age of 67.5 years old and 52.2% being female. Exercise, meditation, and a multidisciplinary intervention improved QOL metrics. The studies on leisure were not interventional and did not directly assess the impact on QOL. Only one study assessed whether the intervention had a long-term impact. This study, which used a multidisciplinary approach, found a significant effect 6 months after the intervention, but different aspects of QOL were impacted at 6 months compared to immediately after the intervention.

Conclusions: Limited research has been conducted on health enhancement activities in patients with age-related vision loss, but the available studies show promising results. There is a need for future RCTs with adequate follow-up to gain a better understanding of the efficacy of these activities in improving quality of life for this patient population.

Identifying novel data sources for population-level cardiometabolic disease surveillance, prediction, and prevention: a scoping review protocol

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Background: Cardiometabolic diseases, including cardiovascular disease, diabetes, and obesity, are a leading cause of death and disability worldwide. Modern advances in population-level disease surveillance are necessary and may inform novel opportunities for precision public health approaches for disease prevention. New sources for data, such as social media and consumer rewards points systems, have emerged in the past few decades that may enhance traditional clinical and public health data sources. These novel data sources may inform cardiometabolic disease surveillance and population-level interventions. However, there is currently no comprehensive review of the scope of newly available, electronic sources of data and how they have been used for cardiometabolic disease surveillance and prevention.

Objective: The primary objective of this review is to describe the scope of newly available, electronic sources of non-clinical data and how it is being used for cardiometabolic disease surveillance and intervention. The secondary objective is to describe the methods, such as machine learning and natural language processing, that have been applied to leverage these datasets.

Methods: We will conduct a scoping review following recommended methodology. Search terms will be based on the three central concepts of non-traditional electronic sources of non-clinical data, cardiometabolic diseases, and population health applications. We will search EMBASE, MEDLINE, CINAHL, Scopus, Web of Science, and Cochrane Library peer-reviewed databases and will also conduct a grey literature search. Articles published from 2000 to present will be independently screened by two reviewers for inclusion at abstract and full text stages, and conflicts will be resolved by a separate reviewer. We will report this data as per the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

Conclusion: The results of this review will summarize the use of non-clinical datasets in cardiometabolic disease surveillance, prediction, and intervention. It is anticipated that these findings will inform targeted public health prevention and intervention strategies cardiometabolic diseases.

Diagnosis and localization of cerebrospinal fluid rhinorrhea: a systematic review

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Background
Cerebrospinal fluid (CSF) rhinorrhea results from abnormal communications between the subarachnoid and sinonasal spaces. Accurate preoperative diagnosis and localization is vital for positive clinical outcomes. However, the diagnosis and localization of CSF rhinorrhea remain suboptimal due to a lack of accurate understanding of test characteristics. This systematic review aims to assess the diagnostic accuracy of various tests and imaging modalities for diagnosing and localizing CSF rhinorrhea.

Methods
A systematic review of the MEDLINE and EMBASE databases was conducted according to PRISMA guidelines.

Results
Our search identified 4039 articles—53 chart reviews and 24 case series describing 1622 patients were included. The studies were heterogenous and had a wide range of sensitivities and specificities. Many specificities were incalculable due to a lack of true negative and false positive results, thus precluding a meta-analysis. Index tests have their own strengths and weaknesses. The chart reviews for HRCT, MRC, CTC, RNC, and CEMRC had sensitivities and specificities of 0.93 (0.65-1.00) and 0.50 (0.00-1.00), 0.94 (0.81-1.00) and 0.77 (0.17-0.99), 0.95 (0.73-1.00) and 1.00 (0.75-1.00), 0.90 (0.81-1.00) and 0.50 (0.00-1.00), and 0.99 (0.96-1.00) and 1.00 (1.00-1.00), respectively [median (IQR)]. Case series were reviewed separately.

Conclusion
MRC is more accurate than HRCT at diagnosing and localizing CSF rhinorrhea. CTC, CEMRC, and RNC have good diagnostic characteristics but are invasive. Beta-2 transferrin is limited by lack of localization. ITF shows promising data but has not been widely adopted for purely diagnostic use. Office endoscopy has limited data but does not sufficiently diagnose CSF rhinorrhea independently.

INTERNAL MEDICINE

Lacrimal gland involvement in MIRAGE Syndrome: A case report

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Background: MIRAGE syndrome is a congenital disorder characterized by myelodysplasia, infection, restriction of growth, adrenal hypoplasia, genital phenotypes, and enteropathy. Few cases of lacrimal involvement have been reported in MIRAGE patients to date. Here, we present a case of deficient lacrimation, with hypoplasia of the lacrimal gland demonstrated on imaging.

Case Description: A 5-month-old male infant with MIRAGE syndrome was seen by Ophthalmology for red eyes. He was found to have bilateral epithelial defects and was prescribed lubricating ointment every 2 hours. Seen on follow-up at 9 months of age, his vision was estimated at 20/380 in both eyes (OU) by Teller Acuity Cards. He had an epithelial defect in both eyes and confluent punctate epithelial erosions in his right eye. Schirmer's test demonstrated significant aqueous tear deficiency (3 mm in the right eye and 2 mm in the left eye). His parents noted that he had never cried with tears since birth. He was started on preservative-free tear drops every hour, a lubricant eye ointment every 2 hours, and erythromycin 3 times per day. MRI imaging showed a hypoplastic lacrimal gland. At follow-up one month later, his vision had further declined to 20/470 (OU). Punctal plugs, which act to retain tears on the ocular surface, were inserted. Three months later, his vision had improved to 20/270 (OU).

Discussion: This case presents deficient lacrimation as a manifestation of MIRAGE syndrome, discusses management, and is the first to demonstrate lacrimal grand hypoplasia in this condition. Since infants born with this condition cannot express symptoms indicating hypolacrima, physicians diagnosing this condition should seek an ophthalmic assessment as soon as possible after birth to prevent irreversible corneal damage. Eye specialists must also be aware of the importance of genetic testing in children presenting with lacrimal dysfunction, as there may be an underlying syndrome

Investigating the prevalence of outcome switching among phase 3 interventional randomized controlled trials for inflammatory bowel disease: a cross-sectional study

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BACKGROUND: Outcome switching is a type of inconsistent reporting in randomized clinical trials (RCTs) involving unexplained changes to pre-specified outcomes between trial registration and publication of results. This is concerning, as selective publication of favorable results can insert bias into the trial's results.

METHODS: We conducted a cross-sectional study to determine the prevalence of correctly reported pre-specified primary and secondary outcomes among phase 3 interventional trials for IBD. We identified relevant trials through a comprehensive search of clinicaltrials.gov. We included all search results with an associated publication that detailed trial results. We excluded abstract-only publications, pooled analyses, and publications reporting results from multiple trials. Two reviewers extracted all pre-specified primary and secondary outcomes for each trial using the clinical trial registration page dated before trial commencement. These outcomes were compared to those reported in the corresponding journal articles. Any discrepancies were noted, and additional outcomes were extracted.

RESULTS: We identified a total of 88 phase 3 interventional RCTs for IBD, of which 57 were matched to independent publications of their results. All trials pre-specified a primary outcome, and 50 (87.7%) pre-specified secondary outcomes. 10 (17.5%) trials did not report some or all primary outcomes, and 19 (33.3%) trials had a change or alteration to the primary outcome. Of the trials that pre-specified secondary outcomes, 16 (28.1%) did not report all pre-specified secondary outcomes. 49 (86.0%) trials added a median of 6 (IQR: 2-8) unspecified secondary outcomes.

CONCLUSIONS: Many phase 3 interventional RCTs in IBD either did not report some or all primary outcomes, or altered the primary outcome. Trials routinely reported additional outcomes that were not pre-specified and failed to note that they were added post hoc. We recommend improvements and greater fidelity to pre-specified outcome reporting to maintain confidence in trial results.

Impact of Digital Health Monitoring in the Management of Inflammatory Bowel Disease

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Background Technological advances now permit self-management strategies using mobile applications which could greatly benefit patient care. The purpose of this study was to investigate whether the use of the inflammatory bowel disease (IBD) digital health monitoring platform, HealthPROMISE, leads to better quality of care and improved health outcomes in IBD patients.

Methods IBD patients were recruited in gastroenterology clinics and asked to install the HealthPROMISE application onto their smartphones. Patient satisfaction, quality of care, quality of life, patient symptoms, and resource utilization metrics were collected throughout the study and sent directly to their healthcare teams. Patients with abnormal symptom/SIBDQ scores were flagged for their physicians to follow up. After one-year, patient outcome metrics were compared to baseline values.

Results Overall, out of 59 patients enrolled in the study, 32 patients (54%) logged into the application at least once during the study period. The number of IBD-related ER visits/hospitalizations in the year of use compared to the prior year demonstrated a significant decrease from 25% of patients (8/32) to 3% (1/32) (p=0.03). Patients also reported an increase in their understanding of the nature/causes of their condition after using the application (p=0.026). No significant changes were observed in the number of quality indicators met (p = 0.67) or in SIBDQ scores (p=0.48).

Conclusion Given the significant burden of IBD, there is a need to develop effective management strategies. This study demonstrated that digital health monitoring platforms may aid in reducing the number of ER visits and hospitalizations in IBD patients.

FINANCIAL CONFLICTS OF INTEREST AMONG PROPENSITY-SCORE MATCHED RETROSPECTIVE STUDIES EVALUATING BIOLOGIC THERAPEUTICS FOR IBD

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Inflammatory Bowel Disease (IBD) studies have commonly relied on real-world evidence to evaluate different therapies. An emerging idea has been the use of propensity score matching as a statistical method to account for baseline characteristics in IBD patients. In retrospective studies, propensity score matching of patients helps reduce treatment assignment bias and mimic the effects of randomization. Recently, propensity-score matching has become an important tool in IBD studies comparing biologic therapeutics. Biologic medications are among the highest-grossing drugs worldwide, and their pharmaceutical producers make considerable payments to physicians to market them. In spite of this, there is a lack of evidence examining the role of undue industry influence among propensity-score matched comparative studies evaluating biologic therapeutics for IBD.

Given the documented association between IBD biologics and FCOI, we hypothesize a high burden of FCOI in propensity-score matched studies. The aim of this study was to evaluate the prevalence of disclosed & undisclosed financial conflicts of Interest (FCOI) in propensity-score matched comparison studies evaluating biologics for IBD.

We developed & ran a librarian-reviewed systematic search on EMBASE, MEDLINE, and Cochrane Library databases for all propensity-score matched retrospective studies comparing biologics for the treatment of IBD. Full-text retrieval & screening was performed on all studies in duplicate. 16 articles were identified. Industry payments to authors were only considered FCOI if they were made by a company producing a biologic that was included in the comparison study. Disclosed FCOI were identified by authors' interests disclosures in full-texts. Any undisclosed FCOI among US authors were identified using the Centre for Medicare and Medicaid Services (CMS) Open Payments Database, which collects industry payments to physicians.

Based on a preliminary analysis of 16 studies, there was at least one author with a relevant FCOI in 14 (88%) of the 16 studies. 14 studies (88%) had at least one disclosed FCOI, while 6 studies (37.5%) had at least one undisclosed FCOI. Among studies with disclosed FCOI, a mean of 40.2% (SD = 23.4%) of authors/study reported FCOI. Among studies with undisclosed FCOI, a mean of 18.8% (SD = 7.0%) of authors/study reported FCOI. The total dollar value of FCOIs was $1,974,328.3. The median conflict dollar value was $5,576.6 (IQR: $321.6 to $36,394.9).

We found a high burden of undisclosed FCOI (37.5%) among authors of propensity-score matched studies evaluating IBD biologics. Given the potential for undue industry influence stemming from such payments, authors should ensure better transparency with industry relationships.

MEDICAL EDUCATION

A Nationwide Survey of Parental Leave Policies in Canadian Surgical Training Programs

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Introduction: For decades, there have been calls to implement parental leave policies for physicians. Although progress has been made, policies are variable across sites, and many are unclear or unspecific. Taking parental leave can be especially challenging in surgical specialties, which are lengthy and have fewer residents per program to cover for those on leave. The present study examined parental leave policies at Canadian academic surgical centres, as well as perspectives on these policies and the effects of becoming a parent in a surgical career.

Methods: An online survey was sent to 16 surgical department chairs across Canada, who were asked to distribute it to all surgical residents, fellows, faculty, and program directors (PDs) within their respective institutions, as well as to complete it themselves. The survey contained closed- and open-ended questions that probed participants' opinions on parental leave, parental leave policies, and the effects of becoming a parent. 182 responses were received between January and May 2019 and analyzed using descriptive statistics.

Results: Findings showed that the ideal amount of time to be taken off for childbearing parental leave was between 9 months and 1 year; however, the actual time taken off was considerably less. PDs and chairs perceived that residents and faculty took more time off for parental leave than what was actually reported. The perceived effect of becoming a parent on wellbeing was poorer for residents than for faculty. Across all roles, respondents reported a lack of knowledge about parental leave, breastfeeding, and return-to-work policies.

Simulated patient encounters: an online medical education tool to train clinical reasoning Skills

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Background: Developing clinical reasoning and decision-making is a key objective of medical education. Currently there are few educational tools which aid in transition from pre-clerkship to clerkship education. Students are expected to apply their knowledge in direct patient encounters without a transition period. Furthermore, the virtualization of clerkship due to COVID-19 has further limited students' direct exposure to clinical patient care. These present a possible gap in the medical curriculum where students lack practical experience in navigating knowledge gathering and decision-making in the clinical setting.

Summary: We have developed an online tool that simulates a virtual clinical visit and a hospital EMR, where students are presented with a patient and chief complaint. Students autonomously gather history, select and interpret physical exams and investigations, generate a list of differential diagnoses, decide upon a final diagnosis, and propose a management plan, at their own pace. Each patient is procedurally generated to enable a large repertoire of cases with varying presentations that mimic a realistic patient population. On completing the case, the student is provided automated feedback on the pertinent aspects of the case. This learning model complements traditional medical teaching by encouraging application of the student's accrued knowledge beyond rote memorization, as well as developing intuition about patient variation and the diagnostic utility of different findings.

Conclusion: We have developed a novel tool for self-directed learning of clinical reasoning skills with over 50 diseases and conditions. We collected qualitative feedback from medical students and faculty members to inform its development and evaluate its usefulness. This demonstrates the potential of computerized simulations as a tool for enhancing medical education.

Parental understanding of research consent forms in the pediatric intensive care unit: a pilot study

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Background: Informed consent is an ethical requirement for research involving human participants. In the pediatric intensive care unit (PICU), consent is frequently sought from legal guardians. However, the stressful nature of the PICU may impact the validity of consent to research obtained from legal guardians in this setting.

Objectives: To describe legal guardians' understanding of key concepts in a research consent form presented within 24 hours of their child's admission to the PICU, and to explore legal guardians' opinions of the format (language, length) of the consent form.

Methods: The STRIPES Questionnaire was developed to test understanding of the six most important concepts in the consent form from a previous PICU trial (STRIPES, NCT02044159). The STRIPES consent form was explained to eligible legal guardians within 24 hours of their child's admission to the PICU at a tertiary care centre in Canada, and their understanding was evaluated using the STRIPES Questionnaire the following day. Demographics were collected via a survey and opinions were collected verbally and via a survey.

R**esults:** This study included 41 legal guardians of 31 patients. The median number of questions answered incorrectly on the STRIPES Questionnaire was 3 out of 7 (IQR = 2-4). Participants best understood the topic of the study (5% incorrect), but 80% of participants were unable to recall a single risk. The median rating of the language in the form was 5 out of 5 (very easy to understand; IQR = 4-5) and 88% of participants said it was a reasonable length. Thirteen participants stated that their current state of mind would impede their understanding.

Conclusion: Despite positive opinions of the consent form, most legal guardians did not understand all key components of the consent information provided to them orally and in writing within 24 hours of their child's PICU admission.

Empathy in Medical Professionals: Augmenting Curriculum and Training (The EMPACT Study)

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Background: Clinical empathy has been defined as physicians' abilities to understand their patients' illness experiences, demonstrate this understanding to their patients, and use this understanding to guide their actions in providing patient-centered care. There is evidence that such empathy improves patient experiences and health outcomes, and protects against physician burn-out. While empathy appears to be an important clinical competency, studies have demonstrated a decline in empathy of medical students during training. Various empathy-enhancing interventions have been proposed, but none of these have been systematically informed by the patient populations they intend to serve.

Objectives: 1) To describe chronically ill Canadian patients' experiences with physician empathy and characterize the components of clinical empathy that are important to patients; 2) To investigate physician agreement with patient-identified components of empathetic care and barriers that physicians face in optimizing such care; 3) To design an educational intervention that will facilitate the development of practical and sustainable empathy skills in Canadian medical students.

Methods: This will be a multi-phase research initiative.
Phase I: Chronically ill adult Canadian patients will be invited to participate in semi-structured virtual focus groups to discuss their experiences with physician empathy during their care. A qualitative grounded theory approach will be used to identify the prevailing themes described by patients.
Phase II: A mixed-methods survey will assess the extent to which a larger sample of chronically ill Canadians agrees with and prioritizes the patient-identified themes. A corresponding survey of Canadian physicians will investigate whether physicians agree with the clinical empathy needs identified by patients, and inquire about physician-perceived barriers to addressing them.
Phase III: Based on the patient- and physician-identified needs and barriers, an educational intervention will be constructed and piloted on medical students at McMaster University.

Conclusion: This project will use a patient-centred approach to innovate Canadian medical school curricula.

Assessment of "Spin" in Published Plastic Surgery Randomized Controlled Trials with Statistically Non-significant Primary Outcomes – A Systematic Review

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Background: RCTs are considered the gold standard when evaluating the effect of a specified intervention. However, in studies with non-significant primary outcomes, there can be bias in reporting results. This is commonly known as "spin", where the reporting of scientific literature is phrased to distort the interpretation of results.

Objectives: To determine the severity and prevalence of spin in plastic surgery randomized clinical trials (RCTs) with non-significant primary outcome results.

Search Strategy: MEDLINE was searched from 2000 to 2019 in the top 15 plastic and reconstructive surgery journals based on Web of Science impact factors.

Selection Criteria: Parallel-group RCTs with non-significant primary outcome results and published between January 1, 2000 to December 31, 2019 in the top 15 plastic and reconstructive surgery journals were included in this study.

Data Collection and Analysis: Analysis began in March 2020. Screening and data extraction were performed by 2 independent investigators. Spin classification criteria was prospectively determined and was recorded in a standard collection form.

Main Results: 68 studies were included in this study. 93% of included studies were identified with spin, including 62 abstracts (91%) and 46 main texts (68%). The most common strategies were focusing on statistically significant secondary outcomes and claiming equivalence for statistically non-significant results.

Conclusions: This study identified that a considerable proportion of non-significant RCTs in plastic surgery are affected by "spin". Consumers of plastic surgery research should be familiar with techniques used to manipulate language to distort findings.

The Case of the disappearing non-traditional Medical Student

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Introduction: The demographic characteristics of medical school students and applicants have been highlighted in discussions about the gaps between the diversity of Canada's doctors and the diversity of the people they serve. This study describes how age demographics have changed among both applicants and program entrants in Canada from 1999 to 2018. Specifically, we outline how proportions of students pursuing medicine from non-traditional trajectories have changed in the past two decades.

Methods: Canadian medical school application data were acquired from the Association of Faculties of Medicine in Canada (AFMC) National Repository, representing 1999 to 2018. Data analysis was conducted using Pandas (v1.1.4) and Seaborn (v0.11.0) Python Packages. Age groups (≤22, 23-24, ≥25 years old) were set using quartile boundaries. Statistical analyses were not conducted, as these data represent the entire applicant population.

Results: Medical student age demographics across Canada have changed substantially over time. The mean age of applicants is younger than two decades ago. The proportion of entrants ≤22 has increased considerably, while the representation of students aged 23-24 and ≥25-year-old students has dropped. These trends differ in magnitude across institutions, with some schools seeing substantial changes in the age diversity of each consecutive entering class.

Interpretation: Older medical students provide unique perspectives in diversity of thought, colleague mentorship, and interdisciplinary skills as future physicians. Medical education leaders may wish to explore how current policies shape age diversity of medical school cohorts, and what the implications might be of fewer medical students with non-traditional paths entering the profession.

The good student or the good patient? the barriers encountered by undergraduate medical students with disabilities at the Northern Ontario School of Medicine

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Background/Purpose: The American Association of Medical College's Lived Experience report was released in March 2018 with hopes of broadening the diversity of medical students to include more of those with disabilities (Meeks & Jain, 2018). In response to this publication, we replicated this study with the research question "What are the barriers encountered by undergraduate medical students with disabilities at the Northern Ontario School of Medicine?". The Lived Experience Project provides a unique opportunity to learn about, and compare the experiences of, participants in this study to medical students at the Northern Ontario School of Medicine (Meeks & Jain, 2018). In doing so, the research explored the climate and culture at NOSM and how this affects the treatment and education of students with disabilities, including the barriers they face throughout medical school.

Methods: A qualitative descriptive study design was used. Data was collected using an initial demographics-based survey followed by a semi-structured interview. Interviews were conducted in person or by telephone Data was transcribed and analysed using Braun & Clarke Thematic Analysis (2013).

Results: It was found that the participants identified barriers directly associated with their medical education in addition to barriers indirectly associated with their medical education and finally, barriers outside of medical school.

Conclusion: The barriers encountered by medical students with disabilities at NOSM supported the themes and barriers identified in Meeks and Jain's (2018) Lived Experience Report. Implications for this research include reviews of accommodation policies, revision of technical standards at a national and institutional level as well as strengthened communication between the student, the medical school, faculty, and administration

"I Can Achieve 'Nything" Roundtable Event: Assessing the impact of providing underprivileged students with exposure to various healthcare professions

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Introduction/Background: Many secondary school students are interested in pursuing a healthcare-related career, due to a desire to help others. However, many misconceptions surrounding these careers remain— opportunities are often dichotomized into medicine or nursing. The socioeconomic capital typically required for success in these fields acts as a barrier for underprivileged students, hindering their interest. To foster a more holistic understanding of healthcare careers, the "I Can Achieve 'Nything" (iCAN) Roundtable event, a component of the novel iCAN project (a collaboration with Pathways to Education - Hamilton, a mentorship/tutoring program for students from low-income neighbourhoods) was created. The roundtable aims to provide iCAN students with the opportunity to engage with healthcare professional students. We aim to assess the effectiveness of this roundtable.

Methods: A survey consisting of 5-point Likert scale-style questions was administered before and after the roundtable to assess interest in and understanding of the seven healthcare professions that were represented at the event: Speech Language Pathology (SLP), Occupational Therapy (OT), Physician's Assistant (PA), Physiotherapy (PT), PhD/scientist (PhD), Medical Doctor (MD), and Registered Nurse (RN).

Results: There was a statistically significant ($p<0.05$) increase in self-reported understanding of the responsibilities of SLPs, OTs, PAs, PTs, and PhDs. There was no statistically significant increase in understanding of the responsibilities of MDs and RNs. In terms of interest, there was only a statistically significant increase for PhDs. Although not statistically significant, there was a slight decrease in interest in becoming an MD post-event.

Conclusions: The roundtable event highlighted the benefits of providing underprivileged students with access to information regarding healthcare professions, particularly those which are not traditionally considered. We plan to build on these results with an integrated mentorship program, in which the students will gain additional exposure to healthcare fields via personalized sessions with students from 14 available professions.

'I Can Achieve 'Nything' day: a comparison of virtual versus in-person events to empower medically-inclined youth from low socioeconomic status backgrounds

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Background: An inclusive physician workforce is essential to meet the needs of Canada's diverse population. However, equity-deserving groups, including students of low socioeconomic status (SES), remain underrepresented. Without significant financial and social capital, low SES students may be discouraged from pursuing medical careers. "I Can Achieve 'Nything" (iCAN) is a medical student-led project in partnership with Pathways to Education Hamilton, a mentorship/tutoring program for secondary students from low-income communities. iCAN aims to promote knowledge about and exposure to healthcare-related fields, and comprises two components: "iCAN day," featuring medicine-focused workshops, and "iCAN mentorship," connecting students with healthcare trainees who offer longitudinal support. iCAN day was held in-person in 2019 (in-person respondents, IPR) and virtually in 2020 (virtual respondents, VR).

Objective & Methods: We sought to evaluate iCAN day's in-person vs. virtual delivery, and its effect on participants' awareness of healthcare careers. In both years, participants completed web-based post-event questionnaires consisting of 5-point Likert scales. Responses were summarized using descriptive statistics and year-to-year comparisons using unpaired one-tailed t-tests.

Results: We received 18 responses in 2019 and 26 in 2020. 88.9% of IPR and 80.8% of VR agreed/strongly agreed that iCAN day improved their understanding of how to become a physician, 88.9% of IPR and 76.9% of VR agreed that their healthcare-related questions were answered (p=0.16), and 77.7% of IPR and 88.5% of VR agreed/strongly agreed that they learned a lot about medicine (p=0.17). There was no statistically significant decline in the mean scores for the aforementioned responses between years.

Discussion: This project highlights the importance of educational events in sparking passion and encouraging low SES students to pursue their healthcare-related interests, and corroborates that virtual events can be as successful as their in-person counterparts.

Feedback processing among faculty members and its impact on faculty feedback initiatives

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Background: Faced with challenges and a need to adapt in an increasingly complex environment, habitual behaviours and mindsets often reinforce individuals' resistance to change. In an educational environment, feedback can allow faculty members and students alike to gain insights that will motivate them towards higher levels of mental complexity. To encourage this development, feedback must be understood with the lens in which faculty process information they receive.

Methods: Faculty members at McMaster University were interviewed using a semi-structured guide to determine what feedback they value, and which factors influence how they process feedback. A generic qualitative method was employed for thematic analysis of participant interviews and several themes were subsequently generated.

Results: Participants included 14 faculty members at McMaster University, of which 5 (38%) were male. Five themes were identified to influence how faculty process their feedback, including: nature of data insight and its utility; impact of others, and impact of culture within the healthcare setting; obstacles to effective processing; and how self-performance is compared to that of others.

Discussion: Feedback to employees and leaders alike permits ongoing development and self-improvement. More specific, actionable feedback is desired to generate learning plans and identify mentorship. Addressing generational differences and delivering feedback appropriately is crucial to responding to feedback appropriately. Through recognition of these factors which influence feedback processing, current faculty feedback initiatives can be enhanced to improve faculty performance overall.

PSYCHIATRY AND BRAIN HEALTH

Sleep, biological rhythms, and anxiety in the perinatal period: A systematic review protocol

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Background/Rationale: The perinatal period is often an exciting time for new parents but can also be a time of increased stress for the family; this increased stress can potentially predispose perinatal individuals to mental health challenges such as depression and anxiety. Perinatal anxiety specifically has been associated with a variety of negative maternal, obstetric, and infant outcomes. Sleep disruption has been shown, in some cases, to be associated with perinatal anxiety, though the nature and direction of this relationship remains unclear. Throughout the perinatal period, sleep and biological rhythms are subject to disruption, as parents adjust to the care of their newborn. To date, there has been no comprehensive review of sleep, biological rhythms, and their relationship with anxiety in the perinatal period. The aim of this review is to provide a systematic understanding of the literature and characterize the nature of the relationships among perinatal anxiety with biological rhythms/ sleep.

Methods: Our review protocol is based on PRISMA guidelines. Studies will be eligible for inclusion if they: 1) investigate perinatal anxiety disorders or symptoms, or related disorders or symptoms (e.g. post-traumatic stress disorder or obsessive-compulsive disorder) in a manner that adequately delineates them from other mental disorders; 2) evaluate sleep and biological rhythms in this period (with the exception of solely jet lag); 3) were published in or translated to English; and 4) are a primary research article with at least four participants. MEDLINE, PsycINFO, Embase and CINAHL will be searched using predetermined search strategies including both controlled subject headings and free-text keywords. Key concepts for search strategies will include the perinatal period, anxiety, and sleep/biological rhythms. Identified articles will undergo de-duplication, followed by title/abstract then full text screening by two independent reviewers (and a third, in case of disagreement). Two reviewers will then independently extract data using a standardized, pre-determined electronic data capture form. Risk of Bias analysis will be conducted using the Cochrane Risk of Bias Tool, followed by narrative synthesis of data. Quantitative analysis will be conducted if sufficiently powered. If relevant, strength of evidence (using GRADE criteria) and publication bias will be assessed.

Conclusion: This systematic review will enhance current understanding of the relationships between perinatal sleep, biological rhythms, and anxiety; clarifying the clinical relevance of these relationships, and informing future research.

Assessing the Postpartum Mental Health of women who have Experienced a Hypertensive Disorder of Pregnancy: A Pilot Study

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Introduction: Hypertensive disorders of pregnancy (HDP) affect 5-10% of all women, and 20% of all mothers experience some form of postpartum psychiatric illness. From clinician experiences, women that experience HDP may experience complications from delivery, leading to prolonged hospital stays and significant psychological stress. However, there exists little evidence to suggest that experiencing HDP is a risk factor for developing a postpartum psychiatric illness. Our study is one of the first of its kind to conduct a primary study examining the relationship between HDP and postpartum mental health and infant behaviours.

Methods: In this pilot study, we are using a case-control design comparing postpartum women whom experienced HDP to a control group of post-partum women whom had routine delivery and postpartum care. Baseline demographics and mental health outcome questionnaires are completed at 6 weeks with follow-ups at 3, 6, 9 and 12 months postpartum. Our primary outcomes include recruitment rate, attrition rate, infant behaviour and mental health outcomes (anxiety, depression, and post-traumatic stress disorder). We will conduct the M.I.N.I at 6 and 12 months.

Results: Our study is currently in the data collection phase. We plan on reporting descriptive statistics to describe our population and demographic factors. Additionally, we plan on using a multivariate regression analysis for continuous outcomes and a logistic regression to report dichotomous outcomes. Longitudinal comparisons will be made using multi-level linear mixed-effects models.
Discussion: We hope that our results will provide additional support for careful postpartum monitoring of mood disorders for women whom experienced HDP**.**

The Trajectories of Body Mass and Adiposity in Survivors of Childhood Brain Tumors: A Protocol Report from the CanDECIDE Study

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Introduction: Survivors of childhood brain tumors (SCBT) are an emerging population thanks to advances in clinical care. However, as this population ages we see that survivors are at increased risk of premature mortality and morbidity, specifically with higher rates of obesity. The mechanisms underlying this trend are not entirely understood.

Objectives: This study seeks to address if there are there any significant trends in BMI percentile scores or the adiposity of SCBT from baseline visit to first follow up two years later. This study has two primary outcomes:
1. To describe the data of body mass index (BMI) percentile scores and adiposity in SCBT and assess for any significant longitudinal changes.
2. To determine whether any other variables which are significantly associated with BMI percentile scores or adiposity in SCBT

Methods: This report is a secondary data analysis from the Canadian Study of Endometabolic Health in Children (CanDECIDE), a multicenter prospective cohort study. Patients were selected based on inclusion and exclusion criteria. BMI will be converted to BMI percentiles. Variables will be tested for normality. Correlations will be performed using Pearson correlation test on the following variables: BMI, body fat percentage (BFP), height, weight, systolic blood pressure, diastolic blood pressure, pulse rate, waist circumference, height circumference, grip strength, sex, puberty level, maternal ethnicity, and paternal ethnicity. Paired t-tests will measure the difference between mean BMI and BFP on baseline versus first follow up visit. Univariate regression analysis will determine the associations of BMI and BFP with age, sex, puberty level, maternal ethnicity and paternal ethnicity. Statistical tests will use a 95% CI with a two-sided alpha of 0.05.

Discussion: This work will further our understanding of the trends in adiposity in SCBT in the years following treatment completion and allow for further research and therapy development.

Frontline staff perceptions of the Safewards model on a forensic psychiatric unit

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Introduction/Background: The Safewards model is an evidence-based program designed to increase safety on inpatient psychiatric wards. Safewards provides a model for why conflict and containment events may occur on a psychiatric ward and provides interventions that can be implemented on the ward to attempt to reduce the number of incidents. As a relatively new program that requires training and time to implement, along with doubts about efficacy and long-term sustainability, some wards have been hesitant to adopt the Safewards program.

Study Objective: This qualitative study sought to obtain feedback regarding the Safewards program from frontline staff on an inpatient forensic unit, three years after implementation of the program, in order to determine their opinions on if the program was effective, and how the program could be improved.
Method: Interviews with 11 frontline staff were conducted anonymously and a content analysis was preformed on the interview transcripts to identify common themes.

Results: The majority of staff expressed that Safewards is an effective and useful program that was worth the time it took to implement, and expressed some suggestions for improvement. More experienced staff are more likely to feel that the program is unnecessary, and newer staff are more likely to feel that they lack sufficient training on the Safewards program.

Conclusion: Specific suggestions and advice from frontline staff was generated through this study. This feedback, taken in consideration with studies that show that Safewards is effective at reducing rates of conflict and containment, could be useful to other inpatient psychiatric wards considering implementing the Safewards program.

ANESTHESIA

Pediatric pain management in the ED - are we getting better?

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Background: Pain management in the ED for pediatric patients has been shown to be poor. Too often, this group either does not receive analgesia or the management of their pain is delayed. The purpose of this study was to look at pediatric pain management in a community health care system.

Methods: Pediatric patients presenting to the Niagara health system during the month of January 2018 were included. Patient demographics were recorded in addition to their CTAS scores and initial assessment time. In addition, the triage record was reviewed to determine if there was an initial pain assessment done, when analgesia was given and route (if it was), and the location of the pain.

Results: There were 972 patients reviewed, of which 52.1% were male. The average CTAS score was 3 and the median initial assessment time by a physician was 71 min (IQR: 115-37). Of all the patients, 73.4% of the patients were assessed for pain at triage. The most frequent areas of pain were head / neck (39.0%, upper extremity pain (22.2%), and lower extremity pain (17.0%). Of those who were treated, oral analgesia was the most common route of pain management (65.7%) followed by topical (17.2% and intramuscular (11.6%). The median time to analgesia was 85.5 min (IQR: 46.3 – 159).

Conclusion: The management of pediatric pain is improving, but still lags behind that of adult patients. Improvements in pain assessment and early analgesia could be implemented with medical directives and increased awareness.

Implications of cannabis use for patients undergoing cardiac anesthesia

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Introduction: Many patients who undergo anesthesia report using cannabis. However, the anesthetic implications associated with cannabis use remain, in large, enigmatic. Cannabis exerts cardiovascular effects. In fact, tachycardia is a feature of the cannabinoid toxidrome. Preclinical observations regarding hemodynamic consequences of cannabinoid agonism are varied. A retrospective cohort analysis of over four-million patients found a statistically significant increase in the incidence of post-operative myocardial infarction in patients who use cannabis. Despite established cardiovascular relevance, the anesthetic implications of cannabis use in patients undergoing cardiac surgery is an uncharted domain. Objective: We reviewed previous literature pertaining to anesthesia and cannabis use to identify pertinent findings and gaps in research with specific interest to the cardiac surgical setting.

Methods: We conducted a database review of previous literature regarding anesthesia and cannabis use. We searched the National Library of Medicine database using the medical subject headings (MeSH) "anesthesia" and "cannabis". Inclusion criteria was study-objective pertaining to anesthesiology and the cannabinoid system. Exclusion criteria was publication year prior to 2000. The articles were subsequently stratified by study design and main finding. We sought to identify studies primarily relating to cardiac anesthesiology.

Results: Of 202 studies identified, 28 met study criteria. Categorization revealed 8 literature/scoping-reviews, 5 recommendations/consensuses, 4 case-series/reports, 3 prospective case-control studies, 2 retrospective cohort studies, 2 randomized clinical-trials, 2 preclinical studies and 2 articles of miscellaneous design. Though several studies tangentially applied to cardiac anesthesia, no study primarily assessed cardiac surgical patients. Conclusion: We conducted a review of literature addressing cannabis use and anesthesia. Many practice recommendations exist but supporting evidence is grossly tenuous, with seldom randomized or prospective data. Moreover, no study specifically evaluated cannabis use in the context of cardiac anesthesia. Prospective studies in the cardiac-surgical setting are required to establish anesthetic considerations for cardiac surgical patients who use cannabis.

The anesthesia clerkship pocket guide for medical students – promoting free open medical education resources in anesthesia

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Introduction: Anesthesia is a mandatory two-week clerkship rotation in most Canadian medical schools, yet student exposure and anesthesia-specific teaching remains low in undergraduate medical education.

Objective: To create a free anesthesia-specific resource specifically for clinical clerks designed to maintain accessibility during the clinical day to enhance experiential learning.

Methods: We used the McMaster anesthesia clerkship learning objectives to guide scope. Each section was authored by a medical student and underwent an iterative review process involving clinical clerks, anesthesia residents, and staff anesthesiologists. The resource was disseminated through social media and outreach to the Association of Canadian University Departments of Anesthesia. A confidential user survey is required prior to initial electronic access.

Results: From the online publication of "Anesthesia: A Clerkship Pocket Guide" (https://mcmasteracp.ca) on 13 April 2020 to 16 February 202, there have been 731 survey respondents from 16 medical schools in Canada and abroad. The majority of respondents were from three programs that have incorporated it into their anesthesia clerkship materials: McMaster University (n=298; 41%), the University of Ottawa (n=222; 31%), and the University of British Columbia (n=91; 12%). Most students indicated intent to use this resource for their core rotation (n = 508) and self-study (n=425) versus during an elective (n=130). The majority of students (n=372; 51%) were not interested in pursuing anesthesia while 27% (n=200) remained undecided. Notably, the majority of students (n=375; 51%) felt either "unprepared" or "very unprepared" for their anesthesia rotation, while only 11% (n=77) felt "prepared" or "very prepared".

Discussion: These survey results correspond with previous research highlighting the lack of significant pre-clerkship exposure and teaching in anesthesia. Next steps include eliciting specific topics contributing to student unpreparedness and addressing them in a pre-clinical setting.

The association between cannabis use and outcomes in pharmacological treatment for opioid use disorder

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Background: The opioid crisis continues to be a major public health concern; with the recent legalization of recreational cannabis, it is important to further understand how cannabis may influence opioid use disorder (OUD) and treatment outcomes. We aimed to explore this relationship through examining the prevalence of past-month cannabis use in patients treated for OUD and the association between cannabis use characteristics and opioid use during OUD treatment.

Methods: Altogether, 2315 participants receiving medication-assisted treatment (MAT) for OUD were recruited from outpatient addiction clinics in Ontario, Canada. Participants provided self-reported information about past-month cannabis use and general cannabis use patterns, and were followed for 3 months to assess non-MAT opioid use during treatment. Logistic regression analysis was used to explore the association between cannabis use and opioid use during treatment. Within the cannabis-user subgroup, logistic regression analysis was also used to assess how cannabis use characteristics may influence opioid use. Qualitative analysis was conducted to assess responses to the question "What effect does marijuana have on your treatment?".

Results: 1178 participants (51%) reported past month cannabis use. There was no significant association identified between self-reported cannabis use and opioid use in the follow-up period (OR = 1.03, 95% CI 0.87–1.23, p = 0.703). Amongst cannabis users, daily cannabis use was associated with lower odds of opioid use compared to occasional cannabis use (OR = 0.60, 95% CI 0.46–0.78, p < 0.001). Reporting cannabis-related side effects was associated with lower odds of opioid use compared to participants with no reported side effects (OR = 0.66, 95% CI 0.52, 0.84, p = 0.001).

Conclusion: Past-month cannabis use had no significant association with non-MAT opioid use during treatment. However, we identified specific cannabis use characteristics that were associated with OUD treatment outcomes. Further research regarding cannabis use patterns of patients with OUD will allow for more informed treatment recommendations.

Fixation of distal radius fractures under wide-awake local anesthesia: a systematic review

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Purpose: The purpose of this review is to analyze the literature on the fixation of distal radius fractures under wide-awake local anesthesia no-tourniquet (WALANT), and to examine postoperative pain scores and functional outcomes, operative data, and the frequency of complications or adverse events.

Methods: Embase, MEDLINE, Web of Science, and SCOPUS were searched from database inception until October 2020 for studies investigating the fixation of distal radius fractures under local anesthesia. Studies were screened for eligibility and data on pain scores, functional outcomes, and adverse events were recorded.

Results: Eight studies (375 patients) were included, of which 185 underwent surgical fixation of a distal radius fracture under WALANT. These patients had a mean age of 50.1 ± 8.7 years, were 42% female, and had a mean follow-up time of 11.6 months (range 6-24). Patients had closed, unilateral distal radius fractures, and the majority (97%) were treated with volar plating. Operative time for WALANT patients averaged 63.6 ± 6.2 minutes, with mean blood loss of 23.3 ± 5.6 mL and mean postoperative pain scores of 1.4 ± 0.6 on a 10-point scale. Furthermore, studies that compared WALANT to general anesthesia found shorter mean hospital stays with most WALANT patients being sent home the same day, as well as decreased postoperative pain scores and decreased costs. Lastly, no adverse events were reported for WALANT patients.

Conclusion: A growing body of literature reports that for closed, isolated DRFs, surgical fixation under local anesthesia is a safe and effective option. It allows patients to have surgery sooner, with improved pain scores and good functional outcomes, with a very low incidence of adverse events. Furthermore, in the setting of surgical backlogs and limited OR time during the ongoing pandemic, innovative strategies such as WALANT can be utilized to fix these fractures without an anesthesiologist and potentially without an OR.

EMERGENCY MEDICINE

Eight Year Analysis of Frequent Emergency Department Use in Southern Ontario

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Introduction: Individuals who are high frequency users of the healthcare system are a relatively small portion of the Canadian population who account for up to two-thirds of healthcare costs. However, only limited information exists regarding characterization of high frequency users and tracking their prolonged use of the emergency department (ED).

Objective: The objective of this study was to characterize high frequency use of the ED among residents of the Hamilton Niagara Haldimand Brant Local Health Integration Network (population: 1.5 million) in Southern Ontario, Canada.

Methods: A descriptive analysis of an eight-year cohort (fiscal years: 2012/13-2019/20) of individuals with high frequency use, defined as having had five (5) or more visits to hospital EDs per year, was undertaken. Information on ED visits and patient characteristics was abstracted. Data were obtained from Integrated Decision Support (IDS) hosted by Hamilton Health Sciences using the National Ambulatory Care Reporting System and the Discharge Abstract Database.

Results: 85,641 adults had high frequency use of the ED, representing 1,014,574 ED visits. Individuals were found to access the ED between 5 and 348 times in a single year. The majority of patients only exhibited high frequency use for 1 or 2 years (87%) over an 8-year period. However, the mean number of annual ED visits increased in every cohort as high frequency use persisted, with cohort 1 having a mean of 6 annual visits (SD: 2) and cohort 8 having a mean of 23 annual visits (SD: 27). Additional characterization focused on the Ontario Marginalization Index and history of presentations to the ED.

Conclusion: This study identifies and compares the characteristics of these patients in relation to how long patients have been exhibiting high frequency use of the ED. Data tracking persistent high frequency use is currently quite limited and as such, findings from this study may inform upstream community interventions.

Impact of health links coordinated care planning on frequent emergency department use

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Objectives: In Ontario, individuals who use the top 5% of hospital and home care services account for 61% of hospital and home care costs. In 2012, Ontario announced the creation of Health Links in each of its Local Health Integration Networks (LHINs) to provide coordinated care planning for individuals with high use of health care services. The objective of the present study was to explore patterns of Emergency Department (ED) utilization among individuals receiving coordinated care planning in the Hamilton Niagara Haldimand Brant (HNHB) LHIN.

Methods: This analysis focused on Health Links model of coordinated care planning enrollees who also experienced frequent use of the ED (5+ visits/year) during the 2012/13 to 2019/20 fiscal years. Information was gathered from the following databases accessed through Integrated Decision Support (IDS) to determine patient characteristics, their ED use, and whether ED use changed after care coordination enrollment: Client Health and Related Information System, National Ambulatory Care Reporting System, and Discharge Abstract Database.

Preliminary Results: 4,294 adult residents met the inclusion criteria. The average age was 69 years (range: 18-101). Participants had a mean of 10 chronic conditions (range: 0-25). Over the course of eight years, there were 148,310 ED visits, averaging 35 per individual (range: 5-1,151). 4,025 individuals (94%) were hospitalized 34,063 times for a total of 302,627 days, averaging 75 days per stay (range: 1-1,117). Of all hospitalized individuals, 2,348 had an ICU stay for a total of 31,854 days, averaging 14 days (range: 1-548). 1,501 of the participants (35%) were deceased during the period of exploration.

Next Steps: This analysis is ongoing with further determination of the reasons for presentation to the ED, including the discharge diagnoses from ED and hospital. Changes in frequency of use over time is to be determined. Further analysis of death data will be undertaken.

Descriptive analysis of patients with high use of ambulance services in Southern Ontario Emergency Departments

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Research shows that individuals who have frequent use of the emergency department (ED) tend to have greater utilization of health care resources. A disproportionate number of frequent users arrive at the ED via ambulance and they have higher rates of leaving without being evaluated by medical staff which may contribute to repeat visits. The purpose of this study was to determine the characteristics and health care utilization patterns of patients who frequently arrive in EDs via ambulance. Using data from the National Ambulatory Care Reporting System and Discharge Abstract Database obtained from Integrated Decision Support (IDS), a descriptive analysis was performed on a population of individuals residing in the Hamilton Niagara Haldimand Brant Local Health Integration Network with five or more annual ambulance arrivals to the ED during one or more fiscal years between 2012/2013 and 2019/20. Information on patient profiles and ED utilization was analyzed and presented descriptively. Preliminary results showed that over this 8-year timeframe, there were 12,554 individuals who used ambulance services 5 or more times. The average age of the patients was 64.9 years and females were slightly overrepresented (51%). A majority of the patients (72%) had four or more chronic conditions. Among the cohort, 9,380 individuals had one year of high use of ambulance services, 1,840 individuals had two years of high use, while 34 individuals experienced high use over eight years. A large proportion of the patients received home care services (76%) and 17% were enrolled on coordinated care plans. As analysis continues, we will determine the reasons for presentation to the ED and discharge diagnoses from the ED and hospital to learn further about the population experiencing high ambulance service use. The findings of this study will contribute to the body of knowledge on Canadian frequent users of ambulance services reaching the ED.

Exploring the process of care for people who inject drugs (PWID) in hospital settings

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Background: In recent years, hospital organizations have been experiencing an alarming increase in admissions of persons who inject drugs (PWID), which have presented unique challenges to the care process. To date, there is little research exploring how care for PWID is enacted within hospital settings. Moreover, existing research does not address how both human and non-human elements shape care experiences.

Study Objective: The purpose of this study was to explore the multiple relations between social and material elements within the hospital setting so as to better understand how care is enacted for PWID in acute healthcare settings and to identify novel approaches for improving this care.

Methods: Data collection and analysis was informed by Actor Network Theory with an emphasis on the relationship between human and non-human actors—such as policy and physical space. Data consisted of observational field notes, interviews, and artifacts from 154 hours spent on inpatient wards and emergency departments of two hospitals in an urban setting in Ontario, Canada.

Results: Care for PWID was enacted differently compared to other patient populations. Resource constraints, differing expectations, and variation in how polices were enacted assembled with challenges to produce misalignments in care. Such misalignments included mistrust between patients and staff, suboptimal pain and withdrawal management, and frequent patient absences and/or discharge against medical advice.

Discussion: Care misaligned in several ways that reflected both social and material elements. Such misalignments demonstrate the need for both hospital staff and systems to challenge existing models of care that are built around individual control, rules, and coercive practices. By altering expectations, interactions, and policy, care experiences could be improved for all.

COVID RESEARCH

Microwave and heat-based decontamination of N95 filtering facepiece respirators: a systematic review

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Background: In pandemics such as COVID-19, shortages of personal protective equipment are common. One solution may be to decontaminate equipment such as facemasks for reuse.

Aim: To collect and synthesize existing information on decontamination of N95 filtering facepiece respirators (FFRs) using microwave and heat-based treatments, with special attention to impact on mask function (aerosol penetration, airflow resistance), fit, and physical traits.

Methods: A systematic review (PROSPERO CRD42020177036) of literature available from Medline, Embase, Global Health, and other sources was conducted. Records were screened independently by two reviewers, and data was extracted from studies that reported on effects of microwave- or heat-based decontamination on N95 FFR performance, fit, physical traits, and/or reductions in microbial load.

Findings: Thirteen studies were included that used dry/moist microwave irradiation, heat, or autoclaving. All treatment types reduced pathogen load by a log10 reduction factor of at least three when applied for sufficient duration (>30 s microwave, >60 min dry heat), with most studies assessing viral pathogens. Mask function (aerosol penetration <5% and airflow resistance <25 mmH2O) was preserved after all treatments except autoclaving. Fit was maintained for most N95 models, though all treatment types caused observable physical damage to at least one model.

Conclusions: Microwave irradiation and heat may be safe and effective viral decontamination options for N95 FFR reuse during critical shortages. The evidence does not support autoclaving or high-heat (>90 degrees C) approaches. Physical degradation may be an issue for certain mask models, and more real-world evidence on fit is needed.

Delivering Eye Care to Homeless and Marginally Housed Populations during the Coronavirus-19 Pandemic: A Pilot Study

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Purpose: Homeless and marginally housed populations experience a higher prevalence of visual impairment relative to the general population. Limited access to eye care for these patients has been further exacerbated by the COVID-19 pandemic. The aim of this pilot study is to present a novel model for conducting ocular screening clinics for marginally housed individuals during a pandemic, and to describe the status of ocular health in this vulnerable population of this vulnerable population during the COVID-19 pandemic.

Study Design: Cross-sectional study.

Methods: Three outdoor, tent-based ocular screening clinics were held in a downtown park in Toronto, Canada. Participants were recruited from local shelters. Prior to enrollment, each participant underwent COVID-19 screening via a questionnaire and temperature measurement. Those who screened negative received a comprehensive eye exam including vision testing, dilated fundus examination, and auto-refraction. The information collected included demographics, ocular history, satisfaction with vision, and the subjective effects of the pandemic on their overall well-being.

Results: Eleven individuals completed all assessments. The mean age of participants was 54.5 years, and 91.7% of participants were men. The incidence of visual impairment was 45.5% of the study sample (n=5). Refractive error via pinhole testing was found in 9.1% of patients (n=1). The rate of ocular pathology in this sample was 36.4% (n=4), which included cataracts (n=1), moderate non-proliferative diabetic retinopathy (n=1), chalazion (n=1), and pterygium (n=1). Two patients required a referral to an ophthalmologist for ongoing care. The psychosocial effects of COVID-19 were pronounced on this sample, with 33.3% (n=4) of participants reporting that they "can barely get through the day".

Conclusion: These preliminary data suggest that COVID-19 has compounded the barriers to ocular healthcare that homeless and marginally housed populations face. A tent-based screening program was a viable option for screening in a pandemic.

Public Health after COVID-19: the future of the Medical Officers of Health (MOH) role

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The COVID-19 pandemic has brought Public Health and Preventative Medicine (PHPM) to the forefront of public attention, and bestowed long-overdue resources to expanding the field's scope and influence. It has also raised the profile of Medical Officers of Health (MOH), a position filled by physicians with specialist training in public health. MOHs balance managerial and communication roles in local health resource allocation and epidemiological disease tracking, with the advisory responsibilities of a senior public servant on behalf of the government.

This scoping review aims to investigate the inconsistencies across regional MOH responsibilities and powers, as well as examine the role conflict between the MOH role as an independent public health defender charged with implementing legislative and/or political policies. Future directions regarding the public health field including but not limited to growing interdisciplinary teams, workforce demographic changes, recent graduate job prospects, and changing MOH responsibilities in a post-COVID context will also be analyzed.

Literature reviews, interviews with current public health professionals and learners, policy papers, news events, as well as data review of workforce demographics will be conducted for this scoping review.

Findings reveal a rapidly changing field, with a myriad of concurrent policy changes addressing current issues such as vacant rural roles, underemployed new PHPM residency graduates, heterogenous responsibilities across regions, and conflicts of interest with political policy priorities. Recommendations are proposed addressing aforementioned current issues, and factors affecting future MOH changes are analyzed.

Ethics of implementing research in a pandemic: understanding moral experiences of those working at the interface of COVID research and clinical care

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Background:
During the COVID-19 pandemic, the lack of proven therapies or prophylactics has made conducting high-quality research an ethical imperative and top policy goal. Nevertheless, guidance stresses that clinical care provision should not be impeded by research activities. These dual priorities of conducting research and providing clinical care during a pandemic give rise to key ethical tensions. Our study sought to explore the moral experiences of those working at the interface of COVID research and clinical care.

Methods:
This exploratory qualitative study was guided by Interpretive Description (ID) methodology. Semi-structured interviews were conducted with 28 participants: 17 investigators (including clinician-researchers), ten frontline clinicians, and one clinical practice leader. Questions explored experiences of balancing clinical care and research priorities and practices in a situation of uncertainty and an emerging pathogen with no known treatment.

Results:
Key areas of ethical tensions emerged, including prioritizing good clinical care for patients versus developing research evidence to inform future patient care (minimizing research burden and harms on patients; considering researchers as circle of care; mobilization of research infrastructure and ethics processes in response to the acuity of need; and the dynamic of the patient-clinician therapeutic relationship); experiencing conflicts around decision-making in the absence of clinical equipoise; and addressing the disconnect between researcher and clinician expectations and experience (past or current) in research. Practical recommendations proposed by participants were aimed at different policy levels: individual, institutional, and regulatory/funding structures.

Implications:
The results of this study indicate a need to better understand how pandemics can disrupt the norms of clinical care and lead to concerns and ethical tensions for those involved. Clarifying individual roles and responsibilities and providing adequate support and preparation for people working at the interface of research and clinical practice are vital to ensure quality patient care, robust research, and researcher and clinician well-being.

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