MMSRD 2024

15TH ANNUAL

MCMASTER MEDICAL STUDENT RESEARCH DAY

MAY 1, 2024

EWART ANGUS CENTRE

WELCOME

DEAR STUDENTS, FACULTY, AND COMMUNITY MEMBERS:

We are thrilled to welcome you to the 15th Annual McMaster Medical Student Research Day (MMSRD)! as an integral part of our academic community, **MMSRD** offers a unique stage for our medical students to share their research accomplishments and engage in stimulating conversations on today's healthcare challenges.

The planning committee crafted an engaging program this year, including a keynote talk from **Dr. Anand Swaminath,** a renowned radiation oncologist and clinician-scientist at Juravinski Cancer Center.

We are pleased to have exceptional abstract submissions this year, including poster presentations and 10-minute thesis talks across multiple disciplines. We have also organized a special panel of aspiring clinician-scientists to provide insight on balancing medical education and research pursuits.

We are grateful for the individuals who have contributed to making **MMSRD** possible this year, from our **MMSRD 2024** planning committee, Dr. Kim lewis, Monica Owen, and our sponsors for their valuable support. Finally, we thank all participants for being part of MMSRD 2024.

As we celebrate the innovative research on display, we hope MMSRD not only broadens our perspective on medicine, but also sparks collaborations that drive progress in medical research.

Sincerely,
Junayd Hussain & Bonnie Lu
MMSRD 2024 co-chairs

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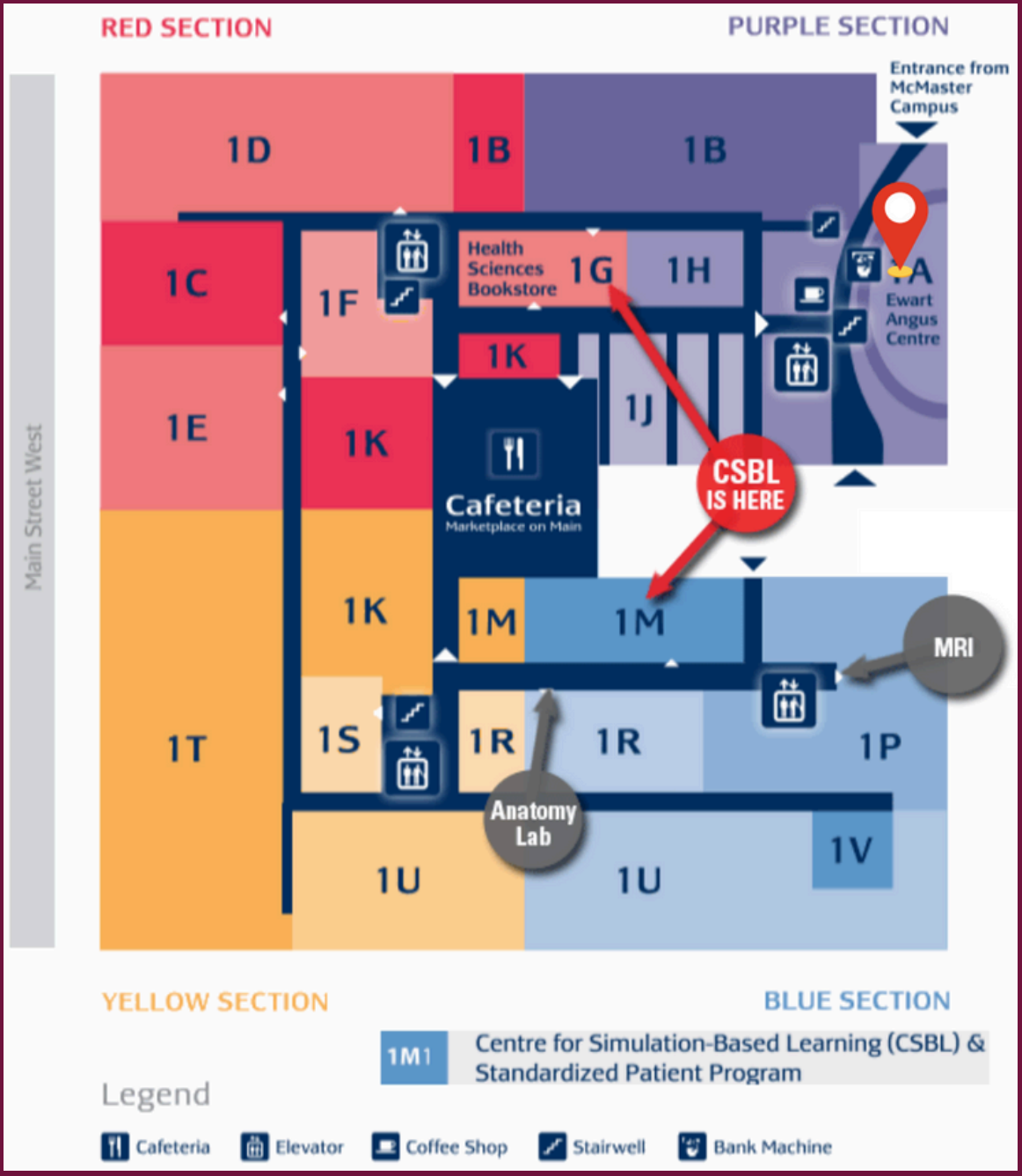
12:00 **13:00**	LUNCH
13:00 **15:30**	POSTER PRESENTATIONS
15:30 **16:30**	PANEL: RESEARCH ACROSS THE MD CAREER
16:30 **17:00**	CLOSING REMARKS & AWARDS

MAP



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ACKNOWLEDGEMENTS

THANK YOU TO ALL OF THE STAFF, FACULTY, AND SPONSORS , WITHOUT WHOM THE **15TH ANNUAL MCMASTER MEDICAL STUDENT RESEARCH DAY** WOULD NOT HAVE BEEN POSSIBLE!

KEYNOTE SPEAKER
DR. ANAND SWAMINATH

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DR. RAJA BOBBA
DR. KIM LEWIS
DR. KATHERINE ZUKOTYNSKI
DR. KAREN TO
DR. BRUNO LOISIER
DR. JOYCE OBEID
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McMASTER UNIVERSITY MEDICAL JOURNAL

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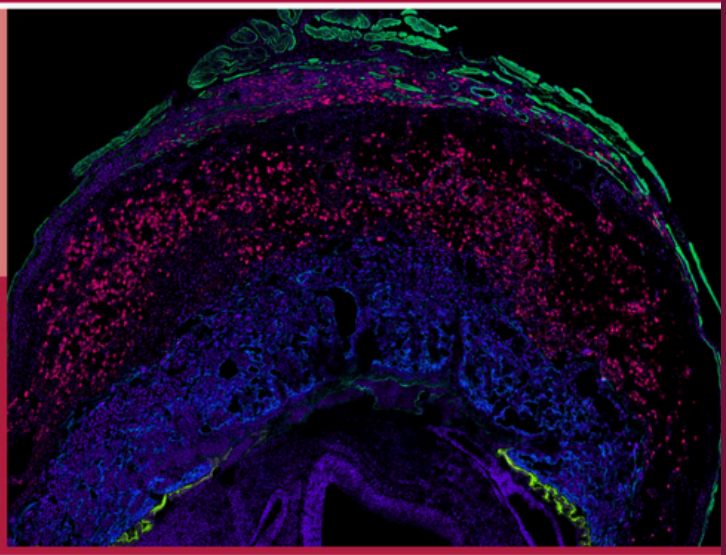


McMaster University

KEYNOTE

DR. ANAND SWAMINATH

MMSRD 2024 KEYNOTE SPEAKER

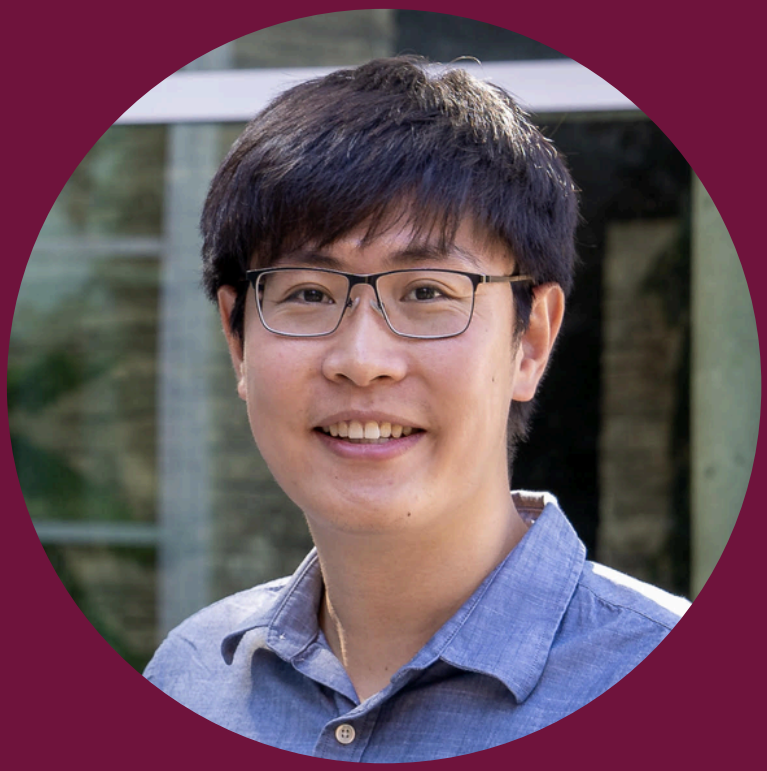
Dr. Swaminath is an associate professor, clinician scientist, and radiation oncologist at the Juravinski Cancer Centre, McMaster university, Hamilton.

He received his medical degree from the University of Ottawa, finished residency training at McMaster university, and completed a clinical-research fellowship in image-guided radiotherapy for lung and liver cancer at the Princess Margaret Cancer Centre.

His clinical and research interests are in the application of new technologies in radiation therapy, specifically stereotacic body radiation therapy (S.B.R.T.) for a wide variety of cancers, including lung, kidney, and liver cancer, for both symptom control and management of metastases.

Dr. Swaminath is a P.I. or radiation lead on several local, national, and international trials evaluating S.B.R.T. in both the primary and metastatic setting. some trials include leading the Canadian L.U.S.T.R.E. randomized lung S.B.R.T. trial, and radiation lead on the C.Y.T.O.S.H.R.I.N.K. and R.A.D.S.T.E.R. trials in kidney cancer. He has authored and co-authored more than 100 peer-reviewed publications and book chapters, and has obtained several large scale grants via C.I.H.R. and C.C.S.R.I.

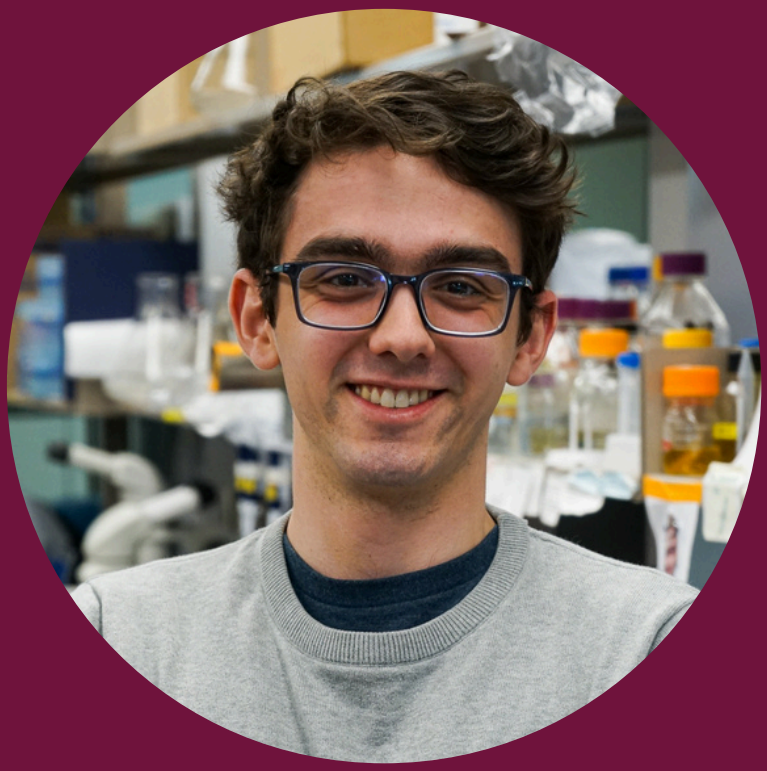
PANEL



ALI ZHANG

Ali is an MD/PhD student in Dr. Matthew Miller's lab in the Department of Biochemistry and Biomedical Sciences at McMaster University. His primary graduate research project was on combinatorial small molecule and antibody therapies against influenza virus infections. He was also involved in several collaborative COVID-19 projects including a genome-wide CRISPR screen on SARS-CoV-2 variants with the University of Toronto, and the TIMING trial with PHRI. Ali is currently completing his final year of clerkship, and will be joining the internal medicine residency program at McMaster University. Outside of work, Ali enjoys spending his time with his Labrador retriever Rio.

PANEL



JAKE COLAUTTI

Jake Colautti is a 2nd year MD/PhD student in the Whitney Lab at McMaster University. His PhD research focuses on understanding the molecular tools bacteria use to compete with each other. Specifically, he is interested in understanding the mechanisms by which protein toxins are recognized and exported by the type VI secretion system of Pseudomonas aeruginosa. Additionally, he is interested in understanding the mechanisms of these toxins' action and their effects on target cell physiology. He hopes that his combination of basic science and clinical training will help him identify critical questions in bacterial cell biology whose answers may offer new strategies to prevent and manage complex infections.

PANEL

DR. LAIYA CARAYANNOPOULOS

Dr. Carayannopoulos completed her Internal Medicine residency and Critical Care fellowship at McMaster in 2022 and has been a Clinical Scholar at St. Joseph's Healthcare Hamilton since graduating. She is currently completing her MSc in Health Research Methodology.

Dr. Carayannopoulos' interests lie in research regarding family engagement in the care of critically ill patients and digital education. She is a methodologist for several guidelines including care of the elderly in ICU, and post-ICU syndrome. Finally, she is an executive producer/developer of the Intern at Work podcast, a podcast focused on core internal medicine topics with over 1.16million downloads worldwide.

PANEL

DR. DAVID ZORKO

Dr. David Zorko (MD, MSc) is a Pediatric Intensivist and Clinical Scholar in the Division of Pediatric Critical Care, Department of Pediatrics at McMaster University. He completed his Pediatric Critical Care Medicine training at The Hospital for Sick Children (University of Toronto) in 2023. In 2021, Dr. Zorko completed his Pediatrics residency in the Clinician-Investigator Program at McMaster University while concurrently obtaining his Master of Science degree in Health Research Methodology. His clinical interests relate to intramural and extramural pediatric critical care outreach, critical care transport, and PICU follow-up. As an early career clinician-investigator, Dr. Zorko's research focuses on long-term outcomes after pediatric critical illness; specifically, chronic critical illness and critically ill children with medical complexity or technology-dependence. He also works with other clinician-investigators and AI specialists to improve the conduct of systematic and scoping reviews using crowdsourcing and machine-learning methodologies,

ORAL PRESENTATIONS

ORAL PRESENTATION #1: Twenty years of participation of racialised groups in type 2 diabetes randomised clinical trials: a meta-epidemiological review

***Rabeeyah Ahmed(1,2)**, Russell J. de Souza(2,3), Vincent Li(1), Laura Banfield(4), Sonia Anand(1,2,3)

(1) Department of Medicine, Faculty of Health Sciences, McMaster University, Hamilton, ON, Canada
(2) Chanchlani Research Centre, McMaster University, Hamilton, ON, Canada
(3) Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, ON, Canada
(4) Health Sciences Library, McMaster University, Hamilton, ON, Canada

Background: Type 2 diabetes mellitus prevalence is increasing globally and the greatest burden is borne by racialised people. However, there are concerns that the enrolment of racialised people into RCTs is limited, resulting in a lack of ethnic and racial diversity. This may differ depending on whether an RCT is government funded or industry funded.

Objectives: To review the proportions of racialised and white participants included in large RCTs of type 2 diabetes pharmacotherapies relative to the disease burden of type 2 diabetes in these groups.

Methods: The Ovid MEDLINE database was searched from January 2000 to December 2020. RCT reports of type 2 diabetes pharmacotherapies published in select medical journals were included. Data including numbers and proportions of participants by ethnicity and race were extracted from trial reports. The participation-to-prevalence ratio (PPR) was calculated for each trial by dividing the percentage of white and racialised participants in each trial by the percentage of white and racialised participants with type 2 diabetes, respectively, for the regions of recruitment. A random-effects meta-analysis was used to generate pooled PPRs and 95% CIs across study types. A PPR <0.80 indicates under-representation and a PPR >1.20 indicates over-representation.

Results: A total of 83 trials were included, of which 15 were government-funded and 68 were industry-funded trials. In government-funded trials, the PPR for white participants was 1.11 (95% CI 0.99, 1.24) and the PPR for racialised participants was 0.72 (95% CI 0.60, 0.86). In industry-funded trials, the PPR for white participants was 1.95 (95% CI 1.74, 2.18) and the PPR for racialised participants was 0.36 (95% CI 0.32, 0.42).

Conclusions: Racialised participants are under-represented in government- and industry-funded type 2 diabetes trials. Strategies to improve recruitment and enrolment of racialised participants into RCTs should be developed.

ORAL PRESENTATION #2: Impaired renal function and major cardiovascular events in young adults: A population-based retrospective cohort study

***Junayd Hussain(1,2)**, Haris Imsirovic(2), Mark Canney(3,4), Edward G Clark(3,4), Meghan J Elliott(5,6), Pietro Ravani(5,6), Peter Tanuseputro(1,2,4,7,8), Ayub Akbari(3), Gregory L Hundemer(2,3,4), Tim Ramsay(1,4), Navdeep Tangri(7), Greg A Knoll(3,4), Manish M Sood(2,3,4)

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(2) ICES, Ottawa, Ontario, Canada
(3) Division of Nephrology, Department of Medicine, The Ottawa Hospital, Ottawa, Ontario, Canada
(4) Ottawa Hospital Research Institute, The Ottawa Hospital, Ottawa, Ontario, Canada
(5) Department of Medicine, University of Calgary, Calgary, Alberta, Canada
(6) Division of Nephrology, Max Rady College of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada
(7) Division of Palliative Care, Department of Medicine, University of Ottawa, Ottawa, Ontario, Canada
(8) Bruyere Research Institute, Ottawa, Ontario, Canada

Background: Cardiovascular (CV) disease in young adults (aged 18-39 years) is on the rise. Whether subclinical reductions in kidney function (ie, estimated glomerular filtration rate [eGFR] above the current threshold for chronic kidney disease but below age-expected values) are associated with elevated CV risk is unknown.

Objectives: The goal of this study was to examine age-specific associations of subclinical eGFR reductions in young adults with major adverse cardiovascular events (MACEs) and MACE plus heart failure (MACE+).

Methods: A retrospective cohort study of 8.7 million individuals (3.6 million aged 18-39 years) was constructed using linked provincial health care data sets from Ontario, Canada (January 2008-March 2021). Cox models were used to examine the association of categorized eGFR (50-120 mL/min/1.73 m2) with MACE (first of CV mortality, acute coronary syndrome, and ischemic stroke) and MACE+, stratified according to age (18-39, 40-49, and 50-65 years).

(Continued...)

Results: In the study cohort (mean age 41.3 years; mean eGFR 104.2 mL/min/1.73 m2; median follow-up 9.2 years), a stepwise increase in the relative risk of MACE and MACE+ was observed as early as eGFR <80 mL/min/1.73 m2 in young adults (eg, for MACE, at eGFR 70-79 mL/min/1.73 m2, ages 18-30 years: 2.37 events per 1,000 person years [HR: 1.31; 95% CI: 1.27-1.40]; ages 40-49 years: 6.26 events per 1,000 person years [HR: 1.09; 95% CI: 1.06-1.12]; ages 50-65 years: 14.9 events per 1,000 person years [HR: 1.07; 95% CI: 1.05-1.08]). Results persisted for each MACE component and in additional analyses (stratifying according to past CV disease, accounting for albuminuria at index, and using repeated eGFR measures).

Conclusions: In young adults, eGFR below age-expected values were associated with an elevated risk for MACE and MACE+, warranting age-appropriate risk stratification, proactive monitoring, and timely intervention.

ORAL PRESENTATION #3: The incorporation of risk-stratification to evaluate the responsiveness of therapeutic lifestyle modification in high risk, high-cost patient populations

***Hila Shnitzer(1), *Justine Lau(1)**

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

Background: Risk stratification of lifestyle interventions aims to optimize resource allocation by focusing treatment intensity on high-risk patients who typically consume more healthcare resources. These patients, including those with low physical activity, positive cardiometabolic risks, or poor mental health, demonstrate significant potential for improvement through increased physical activity, impacting both well-being and healthcare costs.

Objective: The extent to which high-risk patient subgroups achieve clinically significant improvements in health status through lifestyle interventions remains unclear. Accordingly, the objective of this study was to compare the responsiveness of high-risk populations to lifestyle interventions with their lower-risk counterparts.

Methods: Patient responsiveness to My Heart Fitness (MHF), the first value-based learning health system in Ontario, was evaluated across three high-risk subgroups: physically inactive, those with cardiometabolic risks, and those with poor mental health. MHF included digital learning, a 6-month curriculum, and telemedicine appointments. Data from baseline assessments and exit questionnaires, including demographics, health perceptions, and MET-MINUTES, were collected. Outcome measures encompassed changes in MET-MINUTES, overall health, mental health, health knowledge, and drop-out rates.

Results: While the cardiometabolic risk and poor mental health subgroups exhibited no significant differences compared to lower-risk counterparts, the physically inactive subgroup showed significant improvements in MET-MINUTES (P=0.002) alongside increased drop-out likelihood (P=<0.001).

Conclusions: This study demonstrates that high-risk subgroups can generally achieve equal or greater benefits from lifestyle interventions compared to lower-risk counterparts. Therefore, targeting high-risk patients with structured lifestyle programming could be a cost-effective approach. However, preventing drop-out may require further co-interventions throughout the program.

ORAL PRESENTATION #4: The effects of racial discrimination in healthcare on medical mistrust and emotions

***Leigh-Ann J. Grant (1),** Fred Duong (1), Jennifer Stellar (1)

(1) University of Toronto Mississauga Department of Psychology, Mississauga, Ontario, Canada

Background, Objectives & Hypotheses: The study aims to examine healthcare racial discrimination experiences among Black patients and analyze mistrust levels alongside emotional experiences, an approach not taken in prior research. Hypotheses include:

- H1a: People who have had personal experiences of racial discrimination in healthcare will have higher medical mistrust than those without.
- H1b: People who have had vicarious experiences of racial discrimination in healthcare will show higher medical mistrust than those without.
- H1c: Personal experiences of racial discrimination will more strongly relate to medical mistrust than vicarious experiences.
- H2a: Negative emotion intensity will partially explain the relationship between personal & vicarious experiences of racial discrimination and medical mistrust.
- H2b: Negative emotion intensity will be higher for personal experiences than vicarious experiences of discrimination in healthcare.
- H2c: Specific negative emotions (anger, sadness, fear, etc.) will have a stronger influence than general negative emotions on medical mistrust.

Methods: The survey comprised demographic inquiries, items from the Group-Based Medical Mistrust Scale, questions on the frequency, severity, and recency of personal and vicarious healthcare racial discrimination, modified emotion intensity PANAS-GEN items, and open-ended recall of discrimination experiences. 240 Black American adults (59% female, 41% male; mean age 35.8) were recruited via CloudResearch and compensated with $2.50 USD for completing the Qualtrics survey online.

Results: Findings indicated that 70% reported personal or vicarious discrimination, supporting H1a, H1c, H2a, H2b, and H2c. Negative emotions, particularly anger, annoyance, upset, nervousness, and hostility, partially mediated the link between personal experiences and medical mistrust. Frequency of discrimination experiences emerged as a primary predictor, followed by recency, especially in vicarious encounters.

Conclusions: Personal racial discrimination demonstrated a stronger association with medical mistrust than vicarious incidents. Future research endeavours include replicating findings in Canadian Black and/or Indigenous samples, exploring non-racial negative experiences, and comparing various kinds of vicarious encounters.

ORAL PRESENTATION #5: Postoperative Outcomes Following Liver Transplantation for Wilson's Disease: A Systematic Review and Meta-Analysis

***Austine Wang (1),** Noor Bakir (2), Justin Kang (3), Felipe Rodriguez (1,4), Tyler McKechnie (5,6), Cagla Eskicioglu (1,5,6), Pablo Serrano (1,6)

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(6) Division of General Surgery, Department of Surgery, McMaster University, Hamilton, ON, Canada

Background: Wilson's disease results in the accumulation of copper in lysosomes of hepatocytes. When lysosomes burst upon reaching their storage capacity, the release of copper results in hepatocyte and end-organ damage. Liver transplant is indicated in cases of acute hepatic failure, advanced cirrhosis and disease refractory to chelation therapy.

Objectives: This study aims to systematically review data about overall morbidity, hepatic, neuropsychiatric and survival outcomes following liver transplantation for Wilson disease.

Methods: MEDLINE, Embase, Central were searched from inception until July 2023. Peer-reviewed articles and published abstracts evaluating patients diagnosed with Wilson's disease and undergoing any type of liver transplant as a result of the disease were eligible for inclusion. A restricted maximum likelihood random effects model was used to generate the pooled proportion of each outcome. Risk of bias for each included observational study was assessed using the Methodological Index for Non-Randomized Studies tool.

Results: A total of 39 studies met all inclusion criteria. All studies were observational. Specific indications for liver transplant were most commonly fulminant hepatic failure, chronic liver failure and decompensated cirrhosis. The pooled proportions of mortality at 30 days, one year and five years were 0.10 [95% CI 0.08, 0.13], 0.11 [95% CI 0.09, 0.14] and 0.15 [95% CI 0.11, 0.20], respectively. The post-operative complication with the greatest prevalence was biopsy-proven acute rejection with a pooled proportion of 0.20 [95% CI 0.12, 0.31]. The average MINORS score for risk of bias for all studies was 8.19.

Conclusions: Overall, reporting quality and consistency of outcomes included studies was poor. Pooled proportions for 30-day, one-year and five-year mortality are similar, suggesting most post-operative deaths are acute in nature. Future research should incorporate objective measures and the reporting of standardized parameters to allow more robust comparison between studies.

ORAL PRESENTATION #6: Dupilumab and joint-related adverse effects: a systematic review

***Ted Zhou(1),** Abdullah Al Muqrin(2), Mohannad Abu-Hilal(2)

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

Background: Dupilumab was the first FDA-approved biological therapy for atopic dermatitis, inhibiting downstream signaling of IL-4/IL-13. Although not apparent in initial clinical trials, recent real-world data has provided evidence that arthralgia and other joint-related symptoms may be rare, serious adverse effects associated with dupilumab.

Objectives: We conducted a systematic review to synthesize all available data on joint-related adverse effects (JRAEs) among patients receiving dupilumab for atopic dermatitis. Additionally, we sought to outline a treatment algorithm for JRAEs based on current therapies.

Methods: This review was conducted following PRISMA guidelines (PROSPERO: CRD42023492181). Medline, Embase, Web of Science, CINAHL, and CENTRAL were searched on October 2023. Primary outcome was incidence and number of individuals that experienced JRAEs. Secondary outcome was dupilumab discontinuation and efficacy of treatments for JRAEs.

Results: A total of 48 studies satisfied eligibility criteria. Clinical presentations were heterogenous, encompassing localized or generalized arthralgia, joint stiffness, back/muscle pain, and inflammatory arthropathies. Incidence rates of JRAEs ranged from 0.2% to 10%. The most common categories of JRAEs were arthralgia (n=1651 individuals), inflammatory arthropathies (n=181 individuals), back pain (n=82 individuals), and muscle pain (n=54 individuals). Dupilumab discontinuation rate among patients experiencing JRAEs was 1.6%. The treatment strategies for JRAEs were diverse and had mixed effectiveness. Of the 41 individuals treated for JRAEs, 61% achieved remission or significant improvement of joint-related symptoms. Our proposed treatment algorithm consists of short course of NSAIDs, oral prednisone, adjuvant methotrexate, and dupilumab discontinuation with a switch to a JAK inhibitor.

Conclusions: Our review provides evidence that dupilumab is associated with JRAEs and/or arthropathy. Currently, there is a paucity of data to delineate the pathogenesis of JRAEs. Clinicians should be aware of this rare association, which can manifest months after injection. Future studies are needed to further clarify JRAEs and associated risk factors.

POSTER PRESENTATIONS

POSTER PRESENTATION #1: Merkel Cell Carcinoma After Solid Organ Transplant: A Systematic Review

***Samantha Keow (1), *Bonnie Lu (1),** Dea Metko (1), Mohannad Abu-Hilal (1,2)

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

Background: Merkel cell carcinoma (MCC) is a rare and aggressive neuroendocrine tumour with high propensity for recurrence, metastasis, and mortality. Prior studies indicate MCC occurs more frequently in solid organ transplant recipients (SOTR). While the characteristics of SOTR-MCC have previously been examined, a comprehensive systematic review covering all SOT types is lacking.

Objectives: To summarize the literature and provide a comprehensive analysis of the risk factors, clinical characteristics, and outcomes of SOTR-MCC.
Methods: Studies were identified through Ovid's Medline and Embase databases (from inception to December 2023). Observational (case report, case series, cohort, case-control, and cross-sectional) studies published in English that reported on topics relevant to MCC after SOT were included. Two reviewers independently abstracted data and appraised risk of bias (ROB) using the Joanna Briggs Institute critical appraisal tool. Summary standardized incidence ratios (SIRs) were calculated with 95% CIs for applicable studies using a random effects model.

Results: Among 104 identified publications, 30 were included. After citation chaining, a total of 48 observational studies were examined. All were classified as either low or moderate ROB. Six studies reported SIRs; the overall summary SIR for SOTR-MCC was 56.17 (95% CI, 32.78-96.25; P<0.0001), and high heterogeneity was noted. Among kidney transplant recipients, the summary SIR for MCC was 67.90 (95% CI, 44.41-103.82; p < 0.0001). When compared with MCC in immunocompetent individuals, SOTR-MCC often presented with higher risks of progression, recurrence, and overall mortality. Risk factors include male sex, older age, White race, UVR exposure, prolonged time post-transplantation, type of immunosuppressive regimen and specific organ transplanted.

Conclusions: Regular screening for SOTR-MCC is imperative for early detection and improved outcomes, and transplant providers should be familiar with the clinical presentation of MCC. Once SOTR-MCC is diagnosed, prompt and aggressive therapeutic intervention is crucial given a propensity for aggressive behavior and poor prognosis.

POSTER PRESENTATION #2: Genetics module content development, research design, pilot testing, module implementation, and analysis/presentation of findings

***Clara G Hick(1),** Resham Ejaz(2), Anthony J Levinson(3), Jodie Bousfield(4)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
(2) Division of Genetics, Department of Pediatrics, McMaster University, Hamilton, Ontario, Canada
(3) Division of e-Learning Innovation, medportal, and machealth, Department of Psychiatry & Behavioural Neurosciences, McMaster University, Hamilton, Ontario, Canada
(4) Division of e-Learning Innovation, McMaster University, Hamilton, Ontario, Canada

Background: Online resources are increasingly used to supplement resident education. There are currently no specific resources designed for McMaster pediatric trainees on genetics topics, despite it being a mandatory clinical rotation.

Objectives: To design, develop, implement, and evaluate an e-learning course on chromosomal microarray to complement the genetics curriculum for pediatric trainees.

Methods: An instructional systems development framework was used, including needs assessment and best practices in e-learning instructional design. The course provides an overview of chromosomal microarray genetic testing through a case-based approach, and includes a pre- and post-test quiz and evaluation survey delivered through the medportal learning management system. Pilot testers were recruited from a sample of pediatric residents at different levels of training. Data for those that completed the course were analyzed using SPSS, with descriptive statistics and paired sample t-test for comparison of pre- vs post-test scores.

Results: Thirteen residents completed the course. Paired samples two-sided t-test showed a statistically significant improvement from pre-test (mean = 50.8%, SD = 20.8) to post-test (mean = 65.2%, SD = 25.7), p = 0.021. Evaluation data showed that all respondents agreed or strongly agreed that the course was relevant and translatable to clinical learning needs.

Conclusions: Our novel genetics e-learning course on chromosomal microarray testing is beneficial to the clinical learning needs of McMaster Pediatrics residents. Next steps include additional course creation and further dissemination.

POSTER PRESENTATION #3: Redefining documentation in primary care through artificial intelligence: a scoping review

***Saif Ali(1),** Leo Morjaria(1), Sofia Platnick(2)

(1) Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Canada
(2) Faculty of Sciences, Wilfrid Laurier University, Waterloo, Canada

Background: The ever-growing need for primary care providers (PCPs) has intensified the need for innovative solutions to alleviate administrative burdens such as charting. One emerging area of research is the implementation of AI to increase the efficiency of clinical documentation through digital scribes.

Objectives: The objective of this study is to systematically explore the literature surrounding the role of AI in primary care documentation. More specifically, it aims to assess the potential benefits, limitations and barriers to implementation of AI powered digital scribes in primary care settings.

Methods: A systematic search was conducted in MEDLINE, EMBASE and CINAHL. Search terms included ("artificial intelligence" OR "autoscribe" OR "digital scribe") AND ("primary care" OR "family physician") AND ("electronic health record" OR "electronic medical record.") After deduplication, a total of 107 studies were identified. Studies were excluded if they were not relevant to primary care documentation, or studied the use of AI in contexts outside of charting. 15 studies remained for thematic analysis.

Results: Thematic analysis revealed potential benefits including: 1) reduced administrative burden with less time spent on charting; 2) more detailed patient notes; and 3) increased overall efficiency, allowing PCPs to devote more time towards seeing patients and managing complex cases. However, our analysis also revealed numerous concerns including: 1) patient data safety; 2) charting accuracy; 3) physician readiness; and 4) medicolegal liability concerns.

Conclusions: AI-powered digital scribes may offer a ground-breaking solution to alleviate physician burnout, enhance efficiency and improve access to primary care. However the integration of these new technologies must be approached with cautious optimism keeping in-mind the limitations and barriers to implementation.

POSTER PRESENTATION #4: Using the operating room Black Box to assess surgical team member adaptation under uncertainty: an observational study

***Taylor Incze (1),** Sonia Pinkney (1), Cherryl Li (1), Usmaan Hameed (2), Susan Hallbeck (3), Teodor Grantcharov (4), Patricia Trbovich (1,5)

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(2) Department of Surgery, North York General Hospital, Toronto, Ontario, Canada
(3) Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery, Health Care Delivery Research, Surgery, Mayo Clinic, Minnesota, USA
(4) Department of Surgery, Clinical Excellence Research Centre, Stanford University, Stanford, California, USA
(5) Humanera Office of Research and Innovation, North York General Hospital, Toronto, Ontario, Canada

Background: The importance of surgical teamwork in preventing patient harm is well documented. Yet, little is known about how key roles (nurse, anesthesiologist, surgeon, medical trainee) uniquely contribute to teamwork during instances of uncertainty, particularly when adapting to and rectifying an intraoperative adverse event (IAE).

Objectives: Identify how surgical team members uniquely contribute to teamwork and adapt their teamwork skills during instances of uncertainty.

Methods: Audio-visual data of 23 laparoscopic cases from a large community teaching hospital were prospectively captured using OR Black Box®. Human factors researchers retrospectively coded videos for teamwork skills (backup behaviour, coordination, psychological safety, situation assessment, team decision making, leadership) by team role under two conditions of uncertainty: associated with an IAE versus no IAE. Surgeons identified IAEs.

Results: 1015 instances of teamwork skills were observed. Nurses adapted to IAEs by expressing more backup behaviour skills (5.3x increase; 13.9 instances/h during an IAE vs. 2.2 instances/h when no IAE) while surgeons and medical trainees expressed more psychological safety skills (surgeons:3.6x increase; 30.0 instances/h vs. 6.6 instances/h and trainees 6.6x increase; 31.2 instances/h vs. 4.1 instances/h). All roles expressed less situation assessment skills during an IAE versus no IAE.

Conclusions: ORBB enabled the assessment of critically important details about how team members uniquely contribute during instances of uncertainty. Some teamwork skills were amplified, while others dampened, when dealing with IAEs. Knowledge of how each role contributes to teamwork and adapts to IAEs should be used to inform the design of tailored interventions to strengthen interprofessional teamwork.

POSTER PRESENTATION #5: Insights from stroke care workshop surveys in low-resource settings

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Background: The implementation of best stroke care practices is a continuing challenge in low-resource settings. The OSCAIL study trialled workshops for hospital-based healthcare professionals to explore educational methods of addressing this burden, with a didactic model used in Rwanda and PBL model in Uganda.

Objectives: A retrospective survey analysis was completed to examine overall workshop perceptions, achievement of participants' learning objectives, motivation to implement different stroke care practices, and to determine if there were differences in preferences for implementing these practices based on the teaching model used.

Methods: Entry and exit surveys were reviewed and data was collated in Microsoft Excel on participant and workshop characteristics, personal learning objectives, assessments of the workshops, and preferred stroke care practices for implementation in future practice.

Results: Out of 128 participants (Rwanda=38, Uganda=86), 124 (97%) completed entry surveys and 100 (78%) completed exit surveys. The majority of exit-survey participants (94%) gave a positive workshop rating on a 1-5 Likert scale. Most personal learning objectives were in stroke medical management (60%), and 88% of exit survey participants indicated that they met all their learning objectives. When asked to choose three stroke practices to implement in future practice out of twelve options, swallowing assessments were most preferred (54% of participants) and geographic stroke unit development was least preferred (4% of participants). Multidisciplinary stroke care implementation was selected by 58% of participants from PBL workshops, compared to 46% of participants from didactic workshops.

Conclusions: The workshops were well-received and largely effective at meeting learning needs, most of which were in medical management principles. Furthermore, barriers towards the implementation of geographic stroke units may extend beyond what education alone can overcome. Finally, a PBL method of teaching may be more effective than didactic models in motivating the implementation of multidisciplinary stroke care in future practice.

POSTER PRESENTATION #6: Post-traumatic arthritis presenting with erosions in the interphalangeal joints of the hand: a case report

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Background: Post-traumatic arthritis develops after trauma to a joint and clinically presents with swelling, synovial effusion, intense pain, and possible hemarthrosis. Typically, post-traumatic arthritis is self-limited and resolves within 2-3 months. Only one previous case has reported post-traumatic arthritis of the interphalangeal joints of the hands. This is the first reported case of both proximal interphalangeal and distal interphalangeal erosive arthritis post-trauma.

Results: A 64-year-old gentleman described daily stiffness in his right hand as well as swelling and pain in his right 2nd and 4th digits that did not improve with movement and was relieved by acetaminophen. His symptoms began after sustaining a crush injury to his right hand thirteen months prior, that resulted in comminuted fractures of the second-fifth digits. Post-reduction X-ray showed normal fracture healing, however, follow-up X-ray several months later displayed peripheral and central erosions in PIP and DIP joints with associated joint space loss. Given the history, radiology findings, unremarkable bloodwork and absence of synovitis on ultrasound, the erosions are likely secondary to post-traumatic arthritis. Recommended treatment included rehabilitation, exercise, heat/ice, and analgesia as needed.

Conclusions: To our knowledge, this is the first reported case of an erosive arthritis secondary to trauma without any evidence of underlying inflammatory/autoimmune disease. The erosions seen in the patient's radiograph are likely a rare complication of trauma. Further research is needed to discern the prevalence of erosive arthritis post-trauma and how to best treat this condition.

POSTER PRESENTATION #7: Associations between artificial light at night and mental health: A systematic review and meta-analysis

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Background: Artificial light at night (ALAN) is increasingly pervasive in modern society and has been associated with multiple leading global burdens of disease, including mental health outcomes. Shift workers, hospitalized patients, and other specific populations are often predisposed to higher levels of ALAN exposure.

Objectives: We completed the first systematic review and meta-analysis summarizing evidence of the associations between ALAN exposure and mental health outcomes.

(continued...)

Methods: We searched six databases, two registries, and Google Scholar until December 3, 2023 to identify studies considering the associations between ALAN exposure (high vs. low exposure) and mental health outcomes (depression, anxiety, bipolar disorder, and schizophrenia). We completed inverse-variance random-effects meta-analyses to assess these associations for each mental health outcome followed by sensitivity analyses to investigate potential bias. Stratification analyses were performed by exposure type, participant age, and continent for depression prevalence.

Results: We identified 12,783 publications and included 16 in a qualitative synthesis (12 cross-sectional, 4 cohort). ALAN exposure was associated with increased odds of depression prevalence (OR: 1.23; 95% CI: 1.10 to 1.37), with stronger associations for indoor (OR: 1.30; 95: CI: 1.23 to 1.38) than outdoor ALAN exposure (OR: 1.16; 95% CI: 1.04 to 1.29) and in older adults (OR: 1.56; 95% CI: 1.24 to 1.96) compared to younger adults (OR: 1.21; 95% CI: 1.05 to 1.41) or adolescents (OR: 1.07; 95% CI: 0.99 to 1.16), while only minor differences were seen by continent. Associations were also identified for ALAN exposure with increased anxiety prevalence, anxiety incidence, bipolar disorder prevalence, and schizophrenia incidence, but not depression incidence.

Conclusions: ALAN exposure is associated with higher prevalence and incidence of several mental disorders. Further investigations are necessary to understand how these findings could differentially affect specific populations and translate into public health campaigns or preventative measures.

POSTER PRESENTATION #8: Identifying Naturally Evoked Compound Action Potentials (nCAPs) in Nerve Cuff Electrode Recordings Using Deep Learning Methods

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Background: Signals obtained from peripheral nerve cuff electrodes offer a promising avenue for achieving robust control in neuroprosthetic and neuromodulation applications, but effective signal extraction remains a significant challenge. Notably, detecting naturally evoked compound action potentials (nCAPs) can help pinpoint proprioceptive or mechano-sensory afferent activity, but current detection methods often rely on thresholding, which is simple, but may lack accuracy.

Objective & Methods: In this study, spatiotemporal signatures of peripheral nerve cuff electrode activity from nine Long-Evan rats were used to train a convolutional neural network (CNN) for robust nCAP detection.

Results: On generated synthetic data, the developed CNN was able to effectively detect nCAPs at SNRs as low as -25dB, and was able to maintain this performance even when the dataset contained nCAPs of different types. Furthermore, the CNN was generalizable across data taken from different rats, and most notably, the CNN significantly outperformed current nCAP detection methods at SNRs below -10dB. Finally, preliminary testing revealed that the CNN was able to detect nCAPs in in vivo data when trained on the appropriate SNR.

Conclusions: Taken together, these results demonstrate the potential of the proposed method to detect nCAPs in peripheral nerve cuff electrodes, and with future work, may be highly applicable in neuroprosethetic and neuromodulation applications.

POSTER PRESENTATION #9: The effect of antidepressants on behavioural activation therapy in major depressive disorder: a secondary analysis of the BRAVE trial

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Background & Objectives: In a randomized control trial (BRAVE), we previously investigated the effects of behavioural activation (BA) therapy in patients with major depressive disorder (MDD), finding improvements in depression and quality of life in response to BA. This research is a secondary analysis of BRAVE, investigating two objectives: (1) the longevity of the effects of BA; (2) how the response to BA is influenced by concurrent antidepressant usage. The outcomes could influence clinical practices through the integration of BA into depression management and create alternatives or adjuncts to standard antidepressant treatment.

MethodS: Participants (n = 169) were recruited through a mood disorders clinic at St. Joseph's Healthcare Hamilton and randomized into the intervention arm or waitlist arm plus treatment as usual. Participants completed standardized assessments evaluating depression, quality of life (QoL), and biometrics. Data were analyzed from the intervention arm and the waitlist arm following transfer to the intervention arm.

Results: Improvements in depression (Beck Depression Inventory, BDI) and QoL metrics between baseline and end of study persisted up to 1-year post-study once BA group sessions had been completed. Physical health (SF-12 PCS index) did not change during or post-study. Changes in BDI values were not dependent on whether a participant was taking or not taking antidepressants. However, participants on antidepressants recorded higher mental health status and well-being throughout the study (SF-12 MCS) (trend towards significance, $p = 0.078$), while physical status (SF-12 PCS) was reduced ($p = 0.028$).

Conclusions: The findings suggest long-term, persisting benefits of BA. Although the changes in depression (BDI) do not depend on antidepressant usage, mental health status is higher in the antidepressant group. The lower physical health status is possibly attributed to the side effects of antidepressants. The findings point towards a combined pharmacotherapy and BA approach in treating MDD.

POSTER PRESENTATION #10: Examining store-operated calcium entry in cancer-associated fibroblasts derived from pancreatic adenocarcinoma

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Background: Cancer-associated fibroblasts (CAFs) are abundant in the tumor microenvironment of pancreatic adenocarcinoma (PDAC) and consist of distinct phenotypes, greatly influencing tumorigenesis. Notably, high proportions of myofibrotic CAFs (myCAFs) are associated with poorer PDAC survival. In CAF-related pathways contributing to progression of cancer hallmarks, calcium is a key second messenger. Interestingly, CAF growth and migration are enhanced by increased cytosolic calcium concentrations in several cancers. Store-operated calcium entry (SOCE) regulates calcium in non-excitable cells, involving calcium release-activated calcium channel protein 1 (ORAI1), stromal interaction molecule 1 (STIM1), and coiled-coil domain containing 47 (CCDC47). Currently, the role of calcium regulation in PDAC and CAFs is unknown.

Objectives: This study aimed to examine SOCE and myCAF proportion in relation to PDAC patient outcomes and response to treatment.

Methods: CAFs isolated from PDAC biopsies were phenotyped via flow-cytometry. In four CAF lines with varying myCAF proportions, ORAI1, STIM1, and CCDC47 expression was examined via RT-PCR and immunofluorescence. Using Fura-2 assays, we examined basal cytosolic calcium concentrations as well as SOCE response in CAFs after depleting endoplasmic reticulum calcium stores with thapsigargin. Finally, corresponding patient histories were obtained through the DERIVE (Determination of response to therapy in individual patients) research program.

Results: Variations in gene and protein expression of ORAI1, STIM1, and CCDC47 were observed between and within CAF lines. Calcium imaging assays revealed significant differences in calcium concentration and SOCE responses between CAF lines. While PDAC staging at diagnosis varied, all four patients had poor outcomes.

Conclusions: Our findings confirm that SOCE occurs in PDAC CAFs, suggesting differential expression, response, and heterogeneity among different phenotypes. Discovering key SOCE-related genes involved in CAF phenotype and patient outcomes further elucidate the importance of calcium regulation in PDAC tumor microenvironments.

POSTER PRESENTATION #11: Reducing chronic opioid use and dependence following total knee arthroplasty in patients with prior opioid use: a scoping review

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Background: It is estimated that approximately 70% of patients undergoing total knee arthroplasty (TKA) fill an opioid prescription within 1-month post-operation. Patients with prior opioid use have a significantly higher risk of opioid overdose within 30 days post-TKA compared to opioid-naïve patients. Despite these findings, no specific interventions exist for reducing the risk of opioid dependence in TKA patients with prior opioid use.

Objectives: This scoping review aims to conduct a systematic search to explore strategies for minimizing opioid dependence post-operatively in patients undergoing TKA with prior opioid use.

Methods: Medline/PubMed, Embase, Web of Science, and Scopus were searched. Search terms included: “total knee replacement”, “total knee arthroplasty” and abbreviations, “opioid* (use OR consumption OR dependence OR dependency OR addiction)”, and “postoperative OR post-operation* OR post-surgical)”. This yielded 985 articles. Studies were included if patients with prior opioid use were studied, and strategies for reducing opioid-dependence post-TKA were discussed . Studies were excluded strategies for mitigating opioid dependence risk post-TKA were not discussed, or if patients with prior opioid use were not studied specifically. After screening, 11 studies remained. Strategies for reducing opioid-dependence post-TKA in previous opioid users were extracted, meta-ethnographically analyzed and categorized into themes.

Results: Meta-ethnographic analysis revealed multiple strategies: (1) pre-operatively weaning opioids and using platelet-rich plasma (PRP), hyaluronic acid and/or corticosteroid injections perioperatively; (2) increasing pre- and post-TKA education regarding opioid dosage and risk of dependence; (3) increasing emphasis on physiotherapy and adequate physical activity; and (4) increasing sensitivity in identifying opioid use disorder in patients with upcoming TKA procedures and providing appropriate pharmacotherapy and counselling supports.

Conclusions: This study highlights key strategies to reduce the risk of chronic opioid use and dependence in patients with prior use undergoing TKA, emphasizing pre-operative weaning, enhanced patient education, non-opioid pain management, and early identification of opioid use disorder.

POSTER PRESENTATION #12: Skin Pearls for Kids: Delivering skin health workshops to youth in the community

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Background: Despite the crucial role that early skin knowledge plays on children's health, self-esteem, and peer relationships, skin health is seldom addressed in the current elementary school curriculum. As the incidence of skin cancer continues to rise, the primary prevention of skin disease is increasingly important in early years of childhood to promote skin protective behaviours from a young age. Further, destigmatizing conversations around skin can contribute to the acceptance and appreciation of its diversity among youth. Skin Pearls for Kids (SPF-Kids) is a novel medical student-led initiative that strives to address these gaps by delivering interactive skin health workshops to elementary school students in the Hamilton-Halton Region.

Objectives: The objective of this study is to evaluate the impact of SPF-Kids as an educational resource that enhances skin health literacy in youth.

Methods: Skin health workshops spanning 1.5 hours were delivered to grade 4-6 classes across the Hamilton-Halton area. A cross-sectional survey was used to collect feedback from students and teachers. Responses were collected using a Likert scale (scored from 1, strongly disagree, to 5, strongly agree) and short-answer questions.

Results: Students (n=93) reported they enjoyed the workshop (77%), learned something new about skin (84%), and felt the content level was appropriate (85%). Teachers reported that the workshops were interactive and engaging (mean 4.5±0.58), effectively achieved learning objectives (mean 4.5±0.58), and contained valuable content (mean 5±0). Teachers also noted they were interested in participating in future workshops (mean 4.5±1.0). The facilitators reported that delivering SPF-Kids workshops was a meaningful learning experience and helped strengthen their ability to communicate medical concepts in a clear and engaging manner.

Conclusions: SPF-Kids is an innovative solution for enhancing skin literacy in pediatric populations, which may help destigmatize future conversations related to skin health and encourage students to celebrate skin diversity.

POSTER PRESENTATION #13: Anti-amyloid drugs in Alzheimer's disease: a narrative review

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Background: Brain Aβ protein deposition is thought to have a pathologic role in Alzheimer's Dementia (AD). Traditional therapeutics do not modify disease trajectory. With the emergence of anti-amyloid therapies for AD, a strong understanding of these therapies is necessary for clinicians.

Objectives: Describe the current landscape of anti-amyloid therapies for AD;
Recognize the recent anti-amyloid trials' limitations;
Determine which patients are suitable for anti-amyloid therapy based on risk/benefits, cost and patient commitment.

Methods: A narrative synthesis of results from phase 3 clinical trials of anti-amyloid therapies was conducted.

Results: Anti-amyloid therapies are monoclonal antibody drugs; Seven have undergone phase 3 trials. Clinical trials for Lecanemab and Donanemab consistently showed positive findings. None are approved in Canada; Lecanemab has been submitted for review. The drug's cost is approximately $35,000/year. Anti-amyloids have been studied in early AD: mild cognitive impairment (MCI) or mild dementia. It is not recommended for patients with prior brain bleeds, immune disorders, bleeding disorders/anticoagulants, or seizures. There was 0.39-0.67 point slowing of cognitive decline on the CDR-SB 18-point scale. It does not meet the MCID of 0.98 points for MCI and 1.63 points for mild dementia. The most common side effects are infusion reactions. Symptoms include fever and chills. It can be treated with medications. Brain edema called Amyloid-related Imaging Abnormalities (ARIA)-Edema occurred in 12.6%-24% of patients, of which 2.8%-6% were symptomatic. Findings of brain hemorrhage, called ARIA-Hemorrhage, occurred in 17.3%-31.4% of patients; a minority of patients had symptoms. ARIA symptoms include headache and visual changes. Frequent MRIs are needed to monitor for ARIA.

Conclusions: Current anti-amyloid drugs have a small impact on slowing cognitive decline while requiring significant monitoring and cost. Future studies should look into developing a larger effect size, consensus on less restrictive inclusion/exclusion criteria, diversified cohorts, less frequent dosing, and reducing ARIA side effects.

POSTER PRESENTATION #14: Discovering the recurrent fever population at Hamilton Health Sciences

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Background & Objectives: The rapid discovery of recurrent fever syndromes has outpaced the scientific community's ability to adequately describe their epidemiology, clinical course, and genetic determinants, and to disseminate the available information to referring physicians. The aim of this study was to describe the demographics, diagnoses, and disease course of the recurrent fever patient population at Hamilton Health Sciences (HHS).

Methods: A registry was created to follow patients of all ages seen at HHS clinics with recurrent fever syndromes including monogenic fever syndromes, periodic fever, aphthous stomatitis, pharyngitis, and cervical adenitis (PFAPA) and syndrome of undifferentiated recurrent fever (SURF). Data were collected using both a retrospective chart review upon initial enrolment, and prospective data collection at each follow-up visit. Descriptive statistics were used to report on the prevalence of specific periodic fever syndrome diagnoses, time to diagnosis (time between symptom onset and establishment of diagnosis) and response to treatment.

Results: In the first ten months of data collection, 42 participants were enrolled. Median age of participants was 10 years (range 2 – 53 years) and 31% were female. Forty-one percent of patients were diagnosed with familial Mediterranean fever (FMF), 34% were diagnosed with PFAPA, 15% were diagnosed with SURF, and 10% had another monogenic periodic fever syndrome diagnosis, including Behçet's disease and NLRP3-associated autoinflammatory syndrome. Time to diagnosis varied greatly, ranging from 0.4 - 23 years. The mean time to diagnosis was 4.6 (± 6.1) years. Time to diagnosis was shortest for PFAPA (mean 3 ± 2.5 years, range 0.5 – 9) and longest for FMF (mean 7.7 ± 8.2 years, range 0 – 23). The majority (74%) of participants had genetic testing with the Next Generation sequencing autoinflammatory disease and recurrent fever syndrome panel at the Hospital for Sick Children. Twenty-six percent of those tested had a negative panel result.

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Conclusions: Results from this study help to characterize the recurrent fever syndrome patient population in our community. The significant variability and the long mean time to diagnosis highlights the need to identify and address factors associated with diagnostic delay. The next phase of this project will examine those factors and explore the additional diagnostic value of whole exome sequencing for participants with undifferentiated fever syndromes and negative genetic panel testing.

POSTER PRESENTATION #15: Quality and Completeness of Reporting in Pilot and Feasibility Studies in Hip and Knee Arthroplasty: A Methodological Survey

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Background: Pilot or feasibility trials examine the viability and recruitment potential of larger, main trials. Specifically, a pilot trial can be instrumental in identifying methodological issues essential to the development of an effective research protocol. However, numerous studies published as pilot or feasibility studies have demonstrated inconsistencies in the nature of information reported, resulting in lower reporting quality and incomplete reporting practices. It is unclear whether such issues pertaining to reporting completeness are also prevalent in arthroplasty pilot trials.

Objectives: This protocol outlines a methodological survey examining the completeness of reporting among hip and knee arthroplasty pilot trials in accordance with the Consolidated Standards of Reporting Trials (CONSORT extension to pilot and feasibility trials, published by Eldridge et. al. in 2016. Secondary objectives include: i) determining the prevalence of "spin" practices, defined as: a) placing a focus on statistical significance rather than feasibility, b) presenting results that show the trial to be non-feasible as feasible, or c) emphasizing the effectiveness or potential intervention benefits rather than feasibility; ii) determining factors associated with incomplete reporting, and "spin."

(continued...)

Methods:
A search of PubMed will be conducted for pilot and feasibility trials in hip or knee arthroplasty published between January 01, 2017 and December 31, 2023. Following screening, appropriate data will be extracted from eligible publications and reported as descriptive statistics, encompassing elements of the CONSORT checklist extension for pilot and feasibility trials associated with completeness of reporting. Logistic regression analysis and Poisson regression will be used to analyze factors associated with completeness of reporting and spin.

POSTER PRESENTATION #16: Public perspectives on myalgic encephalomyelitis/chronic fatigue syndrome: a Twitter sentiment analysis

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Background: Myalgic encephalomyelitis (ME), also referred to as chronic fatigue syndrome (CFS), is a complex illness that presents with pervasive, often disabling, fatigue, cognitive dysfunction, and impairment of routine functioning. Despite affecting up to 0.9% of individuals globally, including 600,000 Canadians, ME/CFS remains a contentious condition with ongoing debate regarding diagnosis, management, and prognosis.

Objectives: This study seeks to examine public discourse on Twitter to understand the sentiments, concerns, and priorities of individuals living with ME/CFS and associated stakeholders, including researchers and clinicians.

Methods: Twitter application programming interface was used to collect tweets related to ME/CFS posted between January 1st, 2010 to January 30th, 2024. Tweets were cleaned to improve the accuracy of the analyses and stratified according to representative themes. A Robustly Optimized BERT Pretraining Approach (ROBERTa) language processing model was used to analyze the sentiment of tweets by categorizing tweets as positive, negative, or neutral. The syuzhet package in R was used to conduct an emotion analysis of tweets by assigning one of eight emotions to each word in all eligible tweets.

Results: We retrieved 905,718 tweets. Overall, 53% of tweets were neutral, 38% were negative, and 9% were positive. Generally, the most common emotions expressed were sadness, anticipation, fear, and trust. The most frequent emotion surrounding the link between ME/CFS and COVID-19 or Long-COVID was anticipation.

Conclusions: Our sentiment analysis found that tweets related to ME/CFS are rarely positive, and that Twitter may largely serve as a means by which to express frustration. One area associated with positive emotions was the link between ME/CFS and Long COVID.

POSTER PRESENTATION #17: QTc Interval Prolongation in Pediatric Eating Disorders: Impact of Electrolytes and Psychotropic Drugs

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Background: Eating disorders (ED), including anorexia nervosa and avoidant restrictive food intake disorder, often develop in adolescence and are associated with substantial chronicity, morbidity, and mortality. Adverse cardiac outcomes of ED include QTc interval prolongation, which can lead to fatal arrhythmias such as torsades de pointes. The relationship between pediatric ED and QTc prolongation requires clarification to inform clinical electrocardiogram surveillance strategies. Recent findings emphasize external factors, rather than ED disease processes themselves, as salient in QTc prolongation.

Objectives: This study aims to analyze QTc prolongation in pediatric ED patients and its association with psychotropic usage and electrolyte abnormalities.

Methods: From the McMaster Children's Hospital Eating Disorders Service, 443 patients underwent retrospective chart analysis for manual QTc interval calculation and documentation of additional electrocardiogram parameters, serum electrolytes, psychotropic usage, and other clinical outcomes, including cardiac death.

Results: The majority (86%) of participants were female with ages ranging from 6 to 17 (average age = 14). Anorexia nervosa was the most prevalent diagnosis (54%) and over half (59%) of patients received inpatient care. Most (88%) patients had normal (<440ms) QTc intervals, with 7% and 5% having borderline (440-460ms) and prolonged (>460ms) intervals, respectively. Of the 443 patients, 36% used psychotropics known to prolong QTc. The prevalence of QTc prolongation was higher in this group than patients not using psychotropics ($P < 0.05$). Abnormal electrolyte values were not significant in the prevalence of borderline or prolonged QTc intervals ($P > 0.05$). Furthermore, demographic factors including patient sex, inpatient versus outpatient care delivery, and ED diagnosis were also not associated with differences in QTc interval prolongation ($P > 0.05$).

Conclusions: From these preliminary results, we can conclude that pediatric patients with an ED that use QTc prolonging psychotropics have an increased risk of QTc interval prolongation. These individuals may benefit from longitudinal electrocardiogram monitoring.

POSTER PRESENTATION #18: Systematic Review and Network Meta-Analysis on the Efficacy of Systematic Antihistamines in Patients with Atopic Dermatitis

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Background & Objectives: Atopic dermatitis (AD) is a chronic inflammatory skin disease prevalent in ~15% of children and ~3% of adults. Despite their common use in treating AD, the utility of antihistamines remains questionable. Newer generations also lack clear efficacy support.

Methods: We searched MEDLINE, EMBASE, CENTRAL, and CINAHL from inception to 2023 for RCTs comparing oral antihistamines for AD treatment against placebo, standard care, or alternative antihistamines. Text screening, data extraction and bias assessment were performed independently and in duplicate. Outcomes included clinician-reported severity and pruritus scores; assessed using the GRADE approach.

Results: 16 RCTs (n = 2035) compared antihistamines to standard care and addressed clinician-reported AD severity, revealing little clinical efficacy. Sensitivity analyses showed no significant differences across standard (MD –4.14 [95% CI –6.71 to –1.57)), mid (MD –4.97 [95% CI –9.87 to – 0.07]), and high (MD –8.15 [95% CI –13.63 to –2.67]) doses. Ketotifen notably reduced AD severity (MD –23.30 [95% CI –28.56 to –18.03]). 19 RCTs (n = 1550) compared antihistamines to standard care for pruritus outcomes. Standard (MD –0.77 [95% CI –1.22 to –0.32]), mid (MD –0.59 [95% CI –1.50 to 0.33]) and high-doses (MD –0.59 [95% CI –1.50 to 0.33]) showed minimal differences.

Conclusions: Antihistamines mildly improve AD severity and itching, outperforming standard care. Increasing dosage does not improve efficacy significantly. Ketotifen shows significant efficacy. Limitations include varying AD severity among populations and inconsistent online translation methods.

POSTER PRESENTATION #19: A systematic review of abnormalities in intracortical myelin across multiple psychiatric illnesses

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Background: Brain imaging studies have thoroughly investigated brain gray matter abnormalities to assess pathophysiological mechanisms underlying psychiatric illnesses, however white matter has only recently been investigated. Abnormalities in myelination and white matter structures found in the cerebral cortex, known as intracortical myelin (ICM), have been linked with psychiatric illnesses including bipolar disorder (BD) and schizophrenia (SCZ).

Objectives: Here, we provide a comprehensive review of findings that investigate the nature of ICM abnormalities in psychiatric illnesses from neuroimaging studies.

Methods: This systematic search collected studies that evaluated ICM abnormalities using gray/white matter contrast, cortical magnetization transfer ratios or thickness measurements in SCZ, BD, major depressive disorder (MDD) and obsessive compulsive disorder (OCD).

Results: 20 studies were included. Evidence suggests that ICM abnormalities in the frontal lobe are common to all studied psychiatric illnesses. Prominent deficits were also identified across the gyri and insular regions in SCZ; and temporal, parietal and occipital cortices in both BD and MDD. In contrast, increases in ICM were identified across the parietal and temporal cortices in SCZ, and parietal cortex in OCD.

Conclusions: Overall, studies report that selective ICM abnormalities with prominent changes in the frontal cortices are associated with the aforementioned psychiatric illnesses. Further studies are required to elucidate how ICM alterations may be underpinning symptomatology including cognitive difficulty, emotional dysregulation, and memory impairment.

POSTER PRESENTATION #20: The impact of randomized controlled trials on the management of greater trochanteric pain syndrome (GTPS): a citation analysis

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Background: Greater trochanteric pain syndrome (GTPS) is a chronic condition resulting in lateral hip pain. Understanding the impact of GTPS RCTs can enhance understanding of treatment paradigms and better inform clinical decision-making.

Objectives: To identify factors and study characteristics associated with the impact, as measured by the citation density, of RCTs in GTPS management.

Methods: MEDLINE, EMBASE, CENTRAL, SCOPUS, and Web of Science were searched from database inception through September 5th, 2023 for RCTs pertaining to GTPS. Citation metrics were obtained from the Clarivate Web of Knowledge database on September 28th, 2023 for studies meeting inclusion criteria. The fragility index (FI) and continuous fragility index (CFI) were calculated for eligible primary outcomes. Univariate regression models were used to assess correlations between citation density and study characteristics. A sub-analysis by category of intervention was performed, with an ANOVA of study and bibliometric characteristics.

Results: Twenty-one studies published from 2009 to 2023 comprising 1683 patients (1690 hips) were included. Categories of intervention included non-invasive (n = 8), injectable (n = 12), and surgical modalities (n = 1). The median journal impact factor of published studies was 3.4 (IQR 2.4 - 4.8). The mean citation density across all three intervention categories were injectable modalities (4.37 ± 3.39), non-invasive modalities (3.27 ± 1.77), and surgical modalities (1, not applicable). The median CFI was 2 (IQR 0 - 12). Correlation analysis demonstrated a statistically significant correlation to year published ($R = -0.473$, $p = 0.03$) and study sample size ($R = 0.735$, $p < 0.01$).

Conclusions: RCTs assessing the management of GTPS demonstrate a varied range of clinical uptake. The median CFI is low compared to other orthopedic citation analyses, demonstrating that the collective conclusions drawn by these studies are limited by fragility. RCTs on surgical treatments for cases refractory to nonsurgical management are notably underrepresented.

POSTER PRESENTATION #21: Students priming students for success: students as partners in development of pre-lecture resources for introductory genetics

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Background: Large introductory class sizes are challenging for students and instructors for many reasons including the fact that students enter these courses with differing levels of knowledge due to variations in secondary school coverage and students' personal circumstances. The heterogeneity of students' pre-university preparation in the sciences can have a significant effect on their learning and achievement in introductory courses with severe downstream effects on their university outcome and future career. One way to address differential student background is pre-lecture review resources to ensure that students are primed for learning new material.

Objectives: We developed PRIMERs for an introductory genetics course to offer students additional background knowledge in preparation for lectures presenting complex concepts. Further, we present the use of the Students as Partners (SaP) framework with student partners performing various roles in the ideation, creation, assessment, and revision of PRIMERs. We discuss our work as a form of action research, in which the resource was developed and improved through iterative cycles of assessment and revision by our student-instructor team.

Methods: The original iteration of PRIMERs was developed by a student-instructor team. Following its introduction as a course resource, mid-term and end-of-term surveys were used to receive feedback from students. This data was analysed by students and used to make changes to PRIMERs for the following year.

Results: PRIMERs supported learning for most genetics students and the iterations were successful as seen by a reduction in negative reception of certain aspects of the resource.

Conclusions: Utilizing students as part of the resource-development team brought unique insights that allowed for meaningful improvements to course resources. We encourage others to use SaP when designing course materials or revamping a course.

POSTER PRESENTATION #22: Should women who screen GDM-negative and give birth to a macrosomic baby complete an HbA1C test before discharge from the hospital?

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Background: The current screening strategy for gestational diabetes mellitus (GDM) involves a 50g glucose challenge test (GCT). Patients who receive false negative GCT results are vulnerable to long-term implications of GDM due to receiving limited follow-up testing and treatment. A predominant outcome of GDM is macrosomia (birthweight>4000g).

Objectives: This study aimed to determine the utility of HbA1c testing for patients who screened GDM-negative during pregnancy and delivered a macrosomic infant. The study also aimed to determine any predictive factors for a positive HbA1c test.

Methods: A retrospective review was conducted of patients who delivered a macrosomic infant (>4000g) from July 2022 to January 2023 at Kingston Health Sciences Centre, who were not diagnosed with GDM during pregnancy and did not have pre-existing diabetes. Patients who received HbA1c testing were categorized according to HbA1c result into Normal (<5.7%) and Abnormal (≥5.7%) groups. Kruskal-Wallis, chi-square tests, and analysis of variance were used to compare groups, with post hoc tests corrected using the Bonferroni method.

Results: From the study sample (n=116), 38 received an HbA1c test after delivery and 78 did not. Offspring of patients who received HbA1c testing had a median birth weight of 4345.0 (IQR, 4067.5–4487.5) compared to 4140.0 (IQR, 4070.0–4260.0) for patients who did not receive testing ($p<0.01$). 10 patients (26.3%) obtained Abnormal results, indicating false negatives on the 50g GCT. The negative predictive value of the 50g GCT was 0.74 in this sample. Patients who received Abnormal HbA1c results had a median gestational weight gain of 9.5 kg (IQR, 5.3–14.3) compared to a median of 19.5 kg (IQR, 12.2–21.8) for patients who had Normal HbA1c results ($p<0.05$).

Conclusions: Findings from this study indicate that early postpartum HbA1c testing may be a useful way to identify patients who were false negatives on the 50g GCT.

POSTER PRESENTATION #23: Dyslipidemia in Pediatric Type 2 Diabetes Mellitus: A Systematic Review and Meta-Analysis

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Background: Prevalence of type 2 diabetes mellitus (T2DM) in the pediatric population is increasing globally. Children with T2DM are at an increased risk for cardiovascular morbidity. Dyslipidemia is an independent risk factor for cardiovascular disease yet its burden in pediatric patients with T2DM is unknown. Information on the prevalence of dyslipidemia is important to guide enhanced screening and management in this population.

Objectives: The objective of this systematic review and meta-analysis was to estimate the prevalence of dyslipidemia in pediatric T2DM patients.

Methods: Searches were conducted in MEDLINE, Embase, CINAHL, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, and Web of Science Conference Proceedings Citation Index – Science from inception to April 4, 2021, with updated searches conducted on July 21st, 2022. Two reviewers independently screened for observational studies with ≥10 participants and reported dyslipidemia prevalence in pediatric patients with T2DM. Dyslipidemia was defined as: total cholesterol (TC) >200 mg/dL (>5.2 mmol/L), low-density lipoprotein cholesterol (LDL) >130 mg/dL (>3.4 mmol/L), low high-density lipoprotein cholesterol (HDL) <40 mg/dL (<1.04 mmol/L), and triglycerides (TG) >150 mg/dL (>1.7 mmol/L). We pooled studies with similar design, populations, methods, and outcomes in a random-effects model meta-analysis.

Results: Out of 3907 unique records, 54 studies met the inclusion criteria. The prevalence of high total cholesterol in pediatric T2DM was 28.43% (95%CI 26.43-30.32, I2=70%, n=2332), across 16 studies. Elevated LDL prevalence >130 mg/dL, the threshold for treatment initiation, was 26.42% (95%CI 19.07-34.46, I2=83%, n=994), across 9 studies, and low HDL prevalence was 44.59% (95%CI 31.46-58.10, I2=97%, n=2328), across 12 studies. The prevalence of hypertriglyceridemia across 11 studies was 38.10% (95%CI 31.30-45.12, I2=80%, n=1265). Heterogeneity was high in the included studies.

Conclusions: Dyslipidemia is a common morbidity in pediatric T2DM. Regular screening and early initiation of treatment is essential to ensure good cardiovascular outcomes.

POSTER PRESENTATION #24: Effect of electrical stimulation on spasticity of adults with cerebral palsy: A review of the literature

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Background: Cerebral palsy (CP) is the most common motor disability in childhood; and spastic CP constitutes 70-80% of CP cases with patients experiencing increased muscle tone and paresis. Electrical stimulation is one treatment option typically applied as part of physical therapy. When applied to a pediatric population, neuromuscular electrical stimulation [NMES] has been found to produce positive outcomes in muscle strength, gross motor skills and gait kinematics. Although typically nonprogressive, CP symptoms persist over a patient's lifetime, necessitating continued interdisciplinary care. Unfortunately, there is limited research exploring the use of NMES for the treatment of spasticity in adults.

Objectives: This project performed a review on how electrical stimulation therapies when used as adjunctive therapy compare to control treatments in reducing symptoms of spasticity experienced by adults with cerebral palsy.

Methods: A literature search was conducted on PubMED with articles limited to those published 2000 to July 2023 later. An additional search was performed using Google Scholar; the reference lists of articles were also reviewed to identify other potential articles.

Results: With this criteria, 85 articles were found on PubMED and reviewed. Additional articles were identified through Google Scholar search and by reviewing reference lists of included articles. A total of five studies adhering to our criteria were included in this review. The summarized results of all works showed measured improvements in ambulation and functionality scores, suggesting better patient outcomes and daily function. Two works reported directly on spasticity; Ertzgaard et al. observed no statistically significant differences in MAS scores and Johnston et al. who reported mixed results in lower extremity spasticity as measured by a computerized dynamometer.

Conclusions: Despite seemingly equivocal findings, the authors in their conclusions unanimously advocated for the need of future research with larger sample sizes capable of allowing statistical analysis to identify optimal ES strategies and the long term effects of ES in an adult spastic CP population.

POSTER PRESENTATION #25: Prophylactic Treatment for the Prevention of Cystoid Macular Edema Following Cataract Surgery: A Network Meta-Analysis

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Background: Cataracts are the leading cause of global preventable and treatable blindness. Cystoid macular edema (CME) is among the most common complications following cataract surgery. CME impacts patients' quality of life and has economic implications for patients and healthcare systems.

Objectives: To synthesize the evidence from randomized controlled trials (RCTs) evaluating patients receiving prophylactic treatment with topical nonsteroidal anti-inflammatory drugs, topical corticosteroids, subtenon steroids, or a combination of these treatments either pre-operatively and post-operatively or solely post-operatively for the development of CME following uncomplicated, age-related cataract surgery performed by phacoemulsification.

Methods: A systematic review and random effects Bayesian network meta-analysis (NMA) will be performed and reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) extension statement for NMA. A comprehensive electronic search will be performed of the MEDLINE, EMBASE and CENTRAL databases, and the ClinicalTrials.gov and World Health Organization International Clinical Trials Registries. Data will be collected and synthesized for six pre-specified outcomes at 6 weeks and 3 months following surgery: i) best-recorded visual acuity, ii) changes in central retinal thickness measured by optical coherence tomography (OCT), iii) rate of CME measured by OCT, fluorescein angiography (FA), and clinical exam, iv) rate of patients experiencing clinically significant macular edema defined as the presence of CME and pre-specified thresholds for decreased visual acuity, v) patient quality of life, and vi) number of patients experiencing one or more pre-specified adverse events. All stages of the review process will be performed in duplicate. The certainty of evidence for each outcome will be assessed using GRADE NMA guidelines.

Results: Of 2797 search results, 92 RCTs were included. Data extraction is in progress.

Conclusions: The results of this NMA will provide a comprehensive evaluation of the evidence for this critical question with significant clinical equipoise.

POSTER PRESENTATION #26: Motor learning by observation with a non-limb observational video

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Background: Motor learning is an essential component of human adaptation and skill acquisition. Recent research suggests motor learning can occur through observation, for example, watching a naïve actor demonstrate motor learning in a velocity-dependent forcefield. This suggests the brain can transform visual kinematic information from observation into neural representations of muscle movement dynamics. It is not yet clear what components of the visual stimuli is necessary for motor learning by observation to occur.

Objectives: This present study examines whether motor learning can be facilitated by observing a video lacking a human limb, focusing solely on the movement trajectory, thereby isolating the effects of biological motion in observational learning.

Methods: Twenty right-handed participants observed a video of a naïve actor adapting to a velocity-dependent forcefield. The video depicted only the movement trajectory, excluding the actor's limb. Participants' motor output was measured before and after observation by recording changes in lateral force output.

Results: Participants who observed the video of motor learning produced significant compensatory changes in their lateral force output, as compared to their pre-observation force output ($t(19) = 8.35$, $p < 0.001$). The post-observation force output was both velocity-dependent and in the compensatory direction, paralleling the forcefield experienced by the actor in the video.

Conclusions: The study found that biological motion alone elicited effects of motor learning. All participants who observed a naïve participant learning a forcefield later produced compensatory force outputs in the opposite direction, despite never experiencing the forcefield themselves. This suggests possibility of a shared neural substrate in biological motion perception and motor learning. Further research is needed to explore the implications for neurorehabilitation.

POSTER PRESENTATION #27: Determining the true incidence of atrial fibrillation before and after lung resection

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Background: Surgical resections are the primary curative treatment for lung cancer ; these surgeries have a high risk of postoperative cardiac complications, especially atrial fibrillation (AF). Recent literature has reported that asymptomatic AF is not a benign condition, but studies investigating postoperative AF rates have considered only symptomatic AF.

Objectives: This study assesses the total incidence of symptomatic and asymptomatic AF in the perioperative period before and after lung resection for malignancy. The study also assesses feasibility of using ambulatory patch heart monitoring for this purpose.

Methods/Results: Inclusion criteria were that patients must be diagnosed with resectable lung malignancy or metastatic lung disease eligible for metastectomy and booked for pneumonectomy, lobectomy, or anatomical segmentectomy resection. Further, they must have had at least one "high-risk" factor: male gender, age > 65, hypertension, obesity, or tobacco use within the past year. Patients undergoing lung resection emergently or for non-oncologic indications, or who had pre-existing cardiac disease, were excluded.

Ambulatory heart monitoring using a validated patch was used to detect AF events on electrocardiographic monitoring for 7 to 14 days prior to and 14 days following anatomic lung resection for malignancy. Analyses were conducted on all events classified as AF. Kaplan-Meier curves were constructed to display incidence of AF in all patients.

Conclusions: Postoperative AF, including asymptomatic AF, is a common complication of lung resection for malignancy. Ambulatory patch-based monitoring is feasible for determining perioperative Further investigation is needed to identify patient risk factors AF and association with surgical outcomes, for risk stratification and prophylaxis in the appropriate patient groups.

POSTER PRESENTATION #28: Fear of reinjury following primary anterior cruciate ligament reconstruction in paediatric or adolescent patients: a systematic review

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Background: The risk of sport-related injury in youth and adolescents continues to increase as exercise is encouraged in these populations. The resulting reconstructive surgery following a debilitating sports injury such as an ACL tear can lead to varying levels of fear of reinjury. The aim of this study was to determine the factors predictive of kinesiophobia in youth who have undergone ACL reconstruction (ACLR).

Methods: Three online databases (PubMed, MEDLINE, EMBASE) were searched from database inception to February 5th, 2024, to identify literature evaluating kinesiophobia and fear of reinjury following ACLR in pediatric or adolescent patients. The primary outcome was to identify which factors significantly influenced kinesiophobia, which was quantified using the TSK-11 and ACL-RSI scales. Other extracted data included study characteristics, patient demographics, injury details, and surgery details.

Results: Following the removal of duplicates, the initial search yielded 817 articles, of which 26 were ultimately included. This review analyzed 3351 patients, and the mean ages across the articles ranged from 15.9 to 17.8 years old. The mean MINORS score was 9/16 for non-comparative studies and 14/24 for the one included comparative study. There was a significant negative association between kinesiophobia and male gender (4 studies), high IKDC (3 studies), and time post-ACLR (3 studies). There was also a significant positive association between kinesiophobia and having a second ACL injury (3 studies). 18 studies reported ACL-RSI, 5 reported TSK-11, 1 reported both, and 4 reported neither.

Conclusions: Worse outcomes tended to be associated with female gender, second ACL injury, low IKDC score, and shorter time post-ACLR. There also appeared to be some gaps in methodology for these studies, given that TSK-11 has not yet been validated in youth. More RCTs should be done in this population to definitively determine the predictive factors of kinesiophobia in youth.

POSTER PRESENTATION #29: Investigation of abdominoplasty without general anesthesia: a scoping review

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Background: Abdominoplasty is a common aesthetic surgical procedure primarily performed under general anesthesia (GA). However, GA is aerosol-generating and involves extended immobilization associated with systemic complications like venous thromboembolisms (VTEs). There is increasing interest in performing abdominoplasties without GA because of potential lower complication rates and shorter postoperative recovery time. Thus far, evidence regarding the safety and efficacy of abdominoplasty without GA has not been consolidated.

Objectives: This review sought to summarize all available literature on the safety and outcomes of abdominoplasty performed without GA.

Methods: A scoping review was conducted with no date limits in October 2023 encompassing Medline, Embase, Web of Science, and CINAHL. Type of anesthesia was separated into three categories: conscious or intravenous (IV) sedation, regional anesthetic blocks (RAB, i.e. spinal and epidural), and local anesthesia (local infiltration, field blocks).

Results: A total of 28 studies were included. Safety data was reported for abdominoplasty alone (n = 6), with liposuction (n = 14), or both (n = 1). The employed anesthesia methods were IV and local (n = 13), RAB and local (n = 3), IV and RAB (n = 2), IV and RAB and local (n = 2), and IV only (n = 1). A total of 48,379 patients were identified, with 30 cases of VTEs reported. Two studies reported GA conversion rates between 4.8% to 6.0%. In all studies, no patients were hospitalized due to excessive postoperative pain. A total of 11 studies assessed abdominoplasty outcomes, highlighting high patient satisfaction and low postoperative pain.

Conclusions: Our review provides promising evidence that performing abdominoplasty without GA is safe and feasible. Additional high-quality studies are necessary to further validate our findings and to develop a safe, standardized approach."

POSTER PRESENTATION #30: Diagnosis and operative management of adhesions post hip arthroscopy is clinically important but poorly defined: A systematic review

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Purpose: To evaluate the current body of evidence surrounding the diagnosis, management, and clinical outcomes of adhesions developed following hip arthroscopy (HA).

Methods: A systematic search of MEDLINE, Embase, Web of Science, and Cochrane CENTRAL was designed and conducted in accordance with PRISMA guidelines. Eligible studies consisted of patients with confirmed adhesions following HA, with one or more of the following reported: i) diagnostic procedures and criteria employed, ii) indications for and details surrounding surgical management, and iii) clinical outcomes following operative management (e.g., patient-reported outcome measures (PROMs)).

Results: Nineteen studies involving a total of 4,145 patients (4,211 hips; 38% female) were included in this review. The quality of evidence was found to be fair for comparative (mean = 17; range, 13-21) and non-comparative (mean = 10; range, 5-12) studies according to the Methodological Index for Non-Randomized Studies (MINORS) instrument, with the level of evidence ranging from IIB to IV. Adhesions were often diagnosed intra-operatively at the time of revision surgery (n = 10/19; 53%), with only three studies specifying the criteria used to adjudicate adhesions. The most common indication for operative management (i.e., release/lysis of adhesions) was persistent pain (n = 9/19; 47%), but this was often grossly stated for revision HA, rather than being specific to adhesions. PROMs were the most reported post-operative outcomes (n = 9/19; 47%), and generally demonstrated significant improvement across the short-term follow-up period (range, 24.5 to 38.1 months). There was a paucity of objective measures of clinical improvement (n = 3/19; 16%), and an absence of mid-to-long term follow-up (i.e., 5-7 years, and ≥10-years, respectively).

Conclusions: Despite the growing body of evidence suggesting that adhesions are highly contributory to revision HA, there is ambiguity in the diagnostic approach and indications for operative management of adhesions, with no evidence surrounding mid-to-long term clinical outcomes.

POSTER PRESENTATION #31: Analysis of temporal saccade prediction in parkinson's disease using video-based eye tracking

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Background: Our eyes move to detect information that allows us to anticipate events in the surrounding environment. In Parkinson's Disease (PD), key brain regions involved in generating saccades and producing adaptive anticipatory behaviour are impacted, however the intersection of these deficits is not well characterized. Effective PD biomarkers are lacking, and video-based eye tracking provides a low-cost, non-invasive means to quantify eye movement behaviour, including the control of prediction.

Objectives: The present study aimed to analyze predictive saccade performance in PD patients versus controls. Furthermore, it aimed to determine dopaminergic medication effects and associations between performance and motor symptoms.

Methods: Predictive saccade (PS) behaviour was analyzed in 8 PD patients (ON/OFF medication) and 20 controls aged 51-80 years. Participants performed a visual metronome task where they moved their eyes in sync with an regularly oscillating visual target. This was contrasted with a random task where the timing of target appearances was unknown. Saccades made in anticipation of the target were classified as predictive (saccade reaction time (SRT)<100 ms), while those generated after were reactive (SRT>100 ms).

Results: There were no significant differences in saccadic metrics, (i.e., SRT, peak velocity, amplitude) between groups. PD's impact on SRT and PS production was subtle, however patients generated multi-stepping, hypometric saccades with reduced velocity compared to controls. Dopaminergic medication's impact on saccade metrics was inconsistent, with some improvement of amplitude. Weak to moderate correlations were seen between saccade metrics and UPDRS-III or disease duration.

Conclusions: This study contributes to the understanding of saccade performance as a biomarker for differential diagnosis, and in evaluating the neural underpinnings of motor impairments in PD, having important implications for clinicians and researchers in the field of neurodegenerative disease. Further investigation is necessary to identify PS features that are both sensitive and specific to PD.
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POSTER PRESENTATION #32: Approximately Half of Pediatric or Adolescent Patients Undergoing Revision Anterior Cruciate Ligament Reconstruction Return to the Same Level of Sport or Higher: A Systematic Review

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Background: The incidence of graft failure following anterior cruciate ligament reconstruction (ACLR) is particularly high in younger patients, generating a greater demand for revision surgery (r-ACLR). However, it is unclear how surgical decision-making during r-ACLR (e.g. graft choice, fixation strategies, etc) influences patient outcomes in this population.

Objectives: To summarize the surgical considerations and clinical outcomes in pediatric and adolescent patients undergoing r-ACLR.

Methods: Three databases (MEDLINE, PubMed and EMBASE) were searched for studies describing surgical considerations or clinical outcomes for r-ACLR in youth patients. The main surgical considerations were graft type, bone grafting, fixation strategies, and tunneling strategies. The main outcomes were patient-reported outcome measures (Lysholm, Tegner, and IKDC), graft re-rupture, and return-to-sport (RTS).

Results: Eight studies comprising 706 patients were included. The mean age at r-ACLR was 17.1 years. Autografts (67.5%) were more commonly used than allografts (32.2%) with bone-patellar tendon bone (BPTB) grafts being the most prevalent source (59.6%). Bone grafts were used in 4.8% of patients with six being two-stage procedures. The most common femoral and tibial fixation techniques were interference screws (37.6% and 38.1%, respectively) and the most common tunneling strategy was anatomic (69.1%). Meniscus repairs were performed in 39.7% of cases. The re-rupture rate was 13.0% and the RTS rate was 51.6%. The mean (SD) Lysholm score was 88.1 (12.9), the mean (SD) Tegner score was 6.0 (1.6), and the mean (SD) IKDC score was 82.6 (16.0).

Conclusions: R-ACLR in youth patients predominantly uses BPTB autografts and interference screw for femoral and tibial fixation, with concomitant meniscal procedures being common. Compared to published adult data, higher rates of re-rupture and comparable RTS rates were found for younger patients. This review can provide orthopaedic surgeons with a comprehensive understanding of commonly used operative techniques and their influence on outcomes following r-ACLR in youth patients.

POSTER PRESENTATION #33: Meeting the face behind the medical images: Virtual diagnostic radiology consultation clinics to improve patient experience

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Background: Patients receiving medical imaging services in particular have historically expressed feelings of stress and uncertainty. In recent years, radiology consultation clinics have been shown to reduce patient anxiety and improve patient perceptions about their diagnoses and about radiologists in general.

Objectives: To assess patient experience and satisfaction after reviewing imaging results with radiologists during virtual clinics.

Methods: Patients receiving CT imaging at a tertiary care hospital were recruited for virtual radiology consultation clinics (VRCCs) with staff and resident radiologists. VRCCs were conducted over Zoom, during which radiologists shared their images and answered patient questions. Patients then completed a post-consultation survey assessing their experience using 5-point Likert scale, multiple choice, and free-form text responses.

Results: 36 survey responses were collected. Results indicated a high level of satisfaction (5.0 ± 0.2), improved understanding of their diagnosis due to both the discussion (4.8 ± 0.4) and viewing their images (4.7 ± 0.5), and comfort with the virtual format (4.9 ± 0.3). Response breakdown by question can be found in Figure 1. Patient preference for delivery of future results included 93% via virtual call with imaging-sharing capabilities, 7% in-person at a medical facility, and 0% over the phone. All patients expressed a strong interest in participating in future VRCCs. Free-text responses were overwhelmingly positive, with common themes including enhanced understanding of diagnosis, feelings of reassurance, gratitude, and recommendations for improvement.

Conclusions: This study represents the first VRCC pilot in Canada. The positive feedback suggests that VRCCs could improve patient experience, enhance understanding of their diagnosis, and expand the scope of telehealth in radiology. Future studies should focus on recruiting a larger pool of patients across multiple centres, consulting on other imaging modalities, embedding VRCCs into patient management, and evaluating radiologist experience.

POSTER PRESENTATION #34: Examining Scholarly Activity Expectations in Canadian Residency Programs

Asil El Galad, Hanna Van Dierdonck, **Shenna Dunn*, Alyssa Palmateer*,** Caleb Mathai, Nikesh Chander, Seddiq Weera, Larry W. Chambers, Amanda Bell

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During residency program selection, medical students rely on the Canadian Residency Matching Service (CaRMS) website to seek insight into the criteria used by programs for candidate selection. Of particular significance is evaluating scholarly activity, a factor in the selection process influencing an applicant's competitiveness during their match. In 2020, a comprehensive study was undertaken to delve into the role of scholarly activity as a selection criterion within CaRMS, focusing on internal medicine, family medicine, and pediatrics. Subsequently, a follow-up investigation was conducted to assess alterations in these specialties, along with an examination of three additional programs: anesthesia, general surgery, and psychiatry.

The study reviewed CaRMS 2023 R1-entry program descriptions across all 17 Canadian faculties of medicine. Keywords pertaining to scholarly activity were scrutinized within family medicine, internal medicine, and pediatrics and compared to the frequency reported in 2019. Furthermore, the study analyzed the disparities in scholarly activity emphasis across different Canadian regions.

Preliminary findings uncover variations in the importance placed on research experience across residency programs, with certain regions, notably Ontario and Alberta, placing a greater emphasis on scholarly requirements. Of note, competitive specialties such as psychiatry, general surgery, and anesthesia placed a greater focus on research qualifications compared to the other disciplines. Despite the majority of programs emphasizing the consideration of research throughout their selection process, there was diversity in the language used to articulate scholarly requirements and expectations. While some programs explicitly outlined research requirements and relevant skills, others used vague terminology, leaving room for interpretation.

This study serves to provide medical students with a deeper understanding of the value of scholarly activity in their CaRMS application. This study emphasizes the importance of medical programs being more specific and explicit when describing scholarly activity specifications and expectations, a step that would increase transparency and benefit prospective applicants.

POSTER PRESENTATION #35: Perioperative outcomes of laparoscopic donor nephrectomy: A single centre experience

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Introduction: Laparoscopic donor nephrectomy (LDN) remains the gold standard for living kidney donation. There is controversy over the optimal method for controlling the renal vessels. In this study, we assessed outcomes of LDN and compared postoperative outcomes based on the method of vascular control.

Methods: We conducted a retrospective chart review at a single centre examining all adult patients who underwent LDN from 2017-2022. Outcomes we collected included transfusion rate, reintervention rate, and overall complication rate. We also analyzed intra- and postoperative variables, including median operative duration, conversion to open, method of vascular control, estimated blood loss (EBL), and length of stay.

Results: 168 patients were included, with the majority (81%) of patients undergoing left LDN. The median EBL was 100mL (interquartile range [IQR] 100-200mL). Only two patients (1%) experienced hemorrhagic complications, though neither were a result of clip or staple malfunction. When we compared the most common methods of arterial control (staples and clips (69%) versus clips alone (28%)), the use of staples and clips was associated with significantly longer operative duration ($p<0.0008$). However, there were no significant differences in EBL, postoperative hemoglobin decrease, length of stay, or complication rate between groups. No patients required surgical reintervention for any reason and there were no postoperative deaths.

Conclusions: At our center, LDN was associated with low rates of hemorrhagic complications. There was no association between the method used to control the renal artery and the operative outcomes or complication rates. Our data suggest that LDN is a safe procedure with low complication rates.

POSTER PRESENTATION #36: Cardiac dysfunctions in four selected neurological disorders (brain and heart interactions): a systematic review and meta-analysis

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Background: Neurological and cardiovascular disorders are leading causes of morbidity and mortality. While the effects of cardiovascular diseases on the nervous system are well understood, our understanding of the reciprocal relationship has newly developed.

Objectives: To summarize present knowledge and determine the pooled incidence of cardiac dysfunction (CD) in four common neurological disorders: 1. migraine, 2. Alzheimer and other dementias, 3. epilepsy, 4. head injuries.

Methods: We conducted literature searches from 2002 to May 1st, 2023. We included studies with patients ≥18 with one of the four pre-selected neurological disorders that led to CD. Pooled incidence of CD in the four neurological disorders were calculated. Effect estimates for association (odds ratio, hazard ratio) of CD were presented in studies with complete data for both control (without the neurological disorder) and exposure (neurological conditions) groups.

Results: 65 studies (n=4.8 million) were included for qualitative analysis. 60 studies (n=4.7 million) were included for meta-analysis. The pooled CD incidence in the four neurological disorders was 4.22% (95% CI 4.06-4.38). When stratified by neurological disorder, head injuries had the highest CD incidence at 37.52% (95% CI 33.24-41.80). Furthermore, neurological disorders were associated with nearly two-fold increased odds for CD (OR 1.83, 95% CI 1.46-2.29, p=0.001). When stratified by neurological disorder, epilepsy was associated with the greatest odds (OR 2.25, 95% CI 1.82-2.79, p=0.04). The overall pooled adjusted hazard ratio was 1.64 (95% CI, 138-1.94), with head injuries being associated with a hazard ratio exceeding two-fold (HR 2.17, 95% CI 1.30-3.61).

Conclusions: This is the first SRMA to examine this heart and brain interaction. This study exhibited a 4.2% incidence of CD in the four common neurological disorders. Strikingly, these patients have significantly higher odds of developing CD. Large database prospective studies are required to understand long-term consequences of CD in this population.

POSTER PRESENTATION #37: Impact of a multidisciplinary cancer survivorship clinic on patient distress and symptom severity following primary anticancer therapy.

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(1) affiliations

Introduction & Objectives: The Cancer Survivorship Clinic (CSC) was established at William Osler Health System (WOHS) in 2017 to address the transitional gap between oncology and family physicians for patients who have completed primary anticancer therapy. This study aims to determine the patient impact of the CSC.

Methods: This was a retrospective chart review of all survivorship clinic patients from two community hospitals under WOHS in Southern Ontario between Feb 2017 and Jun 2022. Primary outcomes were changes in distress and symptoms, measured through the Distress Thermometer (DT), Canadian Problem Checklist (CPC), and Edmonton Symptom Assessment Scale (ESAS). Descriptive statistics and t-tests were used to assess the CSC impact.

Results: 1,475 patients were enrolled in the CSC from Feb 2017 to Jun 2022, attending a total of 5,733 clinic visits. The average number of visits from consult to discharge was 4.3. 254 (17.2%) patients were male, and 1,221 (82.8%) were female; the median age was 61. The most common diagnosis was breast cancer (69%), followed by GI cancers (23%). 2,333 visits contained DT records; patients with follow-up visits experienced a decline in the average distress score from 3.0 at baseline to 2.6 at first follow-up ($p < 0.05$), especially among high-risk patients with an initial distress score ≥4, from 6.3 to 4.5 ($p < 0.0001$). The most frequently reported problems on the CPC among patients were pain (38%), nervousness/anxiety (33%), fatigue (33%), tingling in hands/feet (32%), and sleep/insomnia (31%). 2,842 visits contained ESAS records; patients with follow-up visits showed declines in anxiety, depression, drowsiness, nausea, and tiredness ($p < 0.05$).

Conclusions: Overall, the CSC has grown rapidly to serve patients across the Greater Toronto Area, mainly with breast and GI cancers. Among a large clinic population, it has reduced the severity of patient distress and symptoms. Future research will examine the clinical significance of these findings.

POSTER PRESENTATION #38: Using Diet to Treat Inflammatory Bowel Disease: A Practical Clinical Guide

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To review the efficacy of various dietary interventions for induc-tion of clinical remission in inflammatory bowel disease (IBD) and provide healthcare providers with a practical reference for recommending suitable diets for managing patients with IBD. A systematic review was conducted. PubMed, Medline(R), and Cochrane were searched from inception up to February 17, 2023, to identify all studies reporting information on using diet to treat IBD. Studies investigating the role of acute dietary in-terventions on adult patients with a confirmed diagnosis of ac-tive IBD for clinical response or remission were considered. Sample meal plans, with lists of included and excluded foods, were also generated to provide clinicians with practical tools for advising patients on diets. We report eleven studies1-11 which provided data on ten distinct diets: autoimmune protocol diet, high fibre diet, 4-SURE diet, highly restrictive organic diet, McMaster elimination diet for Crohn’s disease, specific carbo-hydrate diet, Mediterranean diet, Crohn’s disease exclusion diet, individualized elimination diet, and the food-specific IgG4-guided exclusion diet. Many diets started with elimination phase, and then gradually reintroduced certain foods by tolera-tion. In particular, the highly restrictive organic diet, autoim-mune diet, and Crohn’s disease exclusion diets, were among those to illicit greatest rates of induced remission. It was often emphasized to include whole foods and exclude highly/ultra-processed foods. Presently, there is limited evidence to support the use of specific diets to treat adult patients with mild to moderately active IBD. Larger, randomized studies with stand-ardized methodologies and outcome measures, rigorous adher-ence assessment, and an emphasis on endoscopic assessment outcome measures are required to validate most diets that have been studied for IBD. The included sample diet plans and recommendations may prove helpful in the interim as part of a holistic strategy to manage patients with IBD.

POSTER PRESENTATION #39: Explorers not warriors: a mixed methods study to explore creative confidence in healthcare professionals

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(3) Temerty Faculty of Medicine, University of Toronto

Background: Creative problem solving is crucial for healthcare providers and leaders to navigate an increasingly complex system. Academic medicine has traditionally lacked opportunities for formal education in creativity. One validated measure of the impact of creativity training is Creative Self-Efficacy (CSE), which correlates with increased creativity and performance and can be improved with training or experiences. However, there is a significant gap in research regarding healthcare professionals' perceptions of creativity and effective methods of teaching creativity in medical education.

Objectives: The objectives of this study are to explore healthcare providers and leaders' perceptions of their own creativity and how creativity can be taught and assessed in medical education.

Methods: Participants (n=27) included health professionals across Canada that participated in a 9-week HealthxDesign virtual creativity training program. CSE scores were measured pre-, post- and 3-months post-program. Quantitative data (CSE scores and demographic data) were analyzed using descriptive statistics. Semi-structured interviews were conducted with 11 participants 3 months post-program and analyzed using an inductive thematic analysis.

Results: CSE scores significantly improved after the creativity program but returned to baseline 3-months post-program. Several themes and subthemes emerged, related to the ideas of: (1) creative identity; (2) risk taking; (3) ingredients to support creative work in healthcare; and (4) creativity in action.

Conclusions: This study highlights the importance of fostering creative self-efficacy among healthcare providers with sustained support and reinforcement. Participants' perceptions of their own creativity revealed intricate dynamics influenced by their professional identities, educational experiences, and organizational contexts. There is a need for a paradigm shift towards embracing creativity in healthcare education and practice. This entails fostering environments conducive to risk-taking, collaboration, and leadership. Practical strategies for integrating creativity into healthcare settings emphasize the importance of cultivating supportive environments, dismantling hierarchical frameworks, and providing necessary resources for innovation.

POSTER PRESENTATION #40: Impact on sexuality in patients with atopic dermatitis: before and after treatment with abrocitintib and dupilumab

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Background and Objectives: Atopic Dermatitis (AD) is the most common inflammatory skin condition worldwide. It has been known to severely impact the quality of life (QoL) for people living with the disease. The current literature highlights the burden of AD on QoL including the dysfunction on their sexuality. To our knowledge, there are no studies investigating the sexuality of AD patients after treatment of the disease. Therefore, the aim of this study is to assess whether QoL, with a focus on sexuality and sexual function, differs before and after treatment with advanced therapies, such as abrocitintib and dupilumab, in patients with AD.

Methods: A retrospective chart review of 44 adult patients with the formal diagnosis of AD from an outpatient Dermatology Clinic from January 2015 to July 2023 was conducted. A dichotomous questionnaire was used to assess patients' sexual quality of life before treatment (week 0) and again after treatment (week 52). Factor changes between before and after treatment were inspected using two-proportion tests. Chi-square goodness of fit tests were implemented to explore potential intergroup differences within qualitative variables. Univariate analysis was conducted using logistic regression to assess significant factors contributing to impacted Sexual Life.

Results: Majority of participants (72.7%) had either clear or almost clear disease severity after treatment. Treatment with advanced therapies for AD significantly ($p < 0.001$) improved participants' sexual life. Only 31.8% of participants reported AD still having an impact on their sexual life post treatment highlighting a 56.8% ($p < 0.001$) decrease from before treatment. 100% of participants no longer experienced rejection due to their AD skin changes after treatment noting an approximate 57% decrease from before treatment.

Conclusions: Moderate to severe AD poses a significant impact on a patient's sexual life however, treatment with Abrocitinib and Dupilumab can provide substantial improvement to the quality of their sexuality.

ABOUT MMSRD

WELCOME TO THE 15th annual McMaster Medical Student Research Day!

MMSRD was established in 2010 by Alex Kaplan (c2012) to highlight the crucial role of research in connecting scientific discovery with clinical practice, inspiring attendees to combine scientific inquiry with creative thinking to address pressing medical challenges.

MMSRD has expanded in both scale and reach, drawing on guidance by previous years' co-chairs:

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- Branavan Manoranjan, Zamin Ladha (2012-13)
- Ilana Hanes, Derek Chan (2013-14)
- Rebecca Robin, Emerson Marinas (2014-15)
- Roman Reznikov, Isabel Kim (2015-16)
- Karishma Manji, Marina Wang (2016-17)
- Aadil Bharwani, Jennifer Asselstine (2017-18)
- Ali Zhang, Charlotte Mcewen (2018-19)
- Mary Boulos, Parnian Pardis (2019-20)
- Andrew Chen, Cindy Nhuyen (2020-21)
- Jianhan Wu, Humaira Niazi (2021-22)
- Catherine Andary, Joe Steinman (2022-23)
- **Junayd Hussain, Bonnie Lu (2023-24)**

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