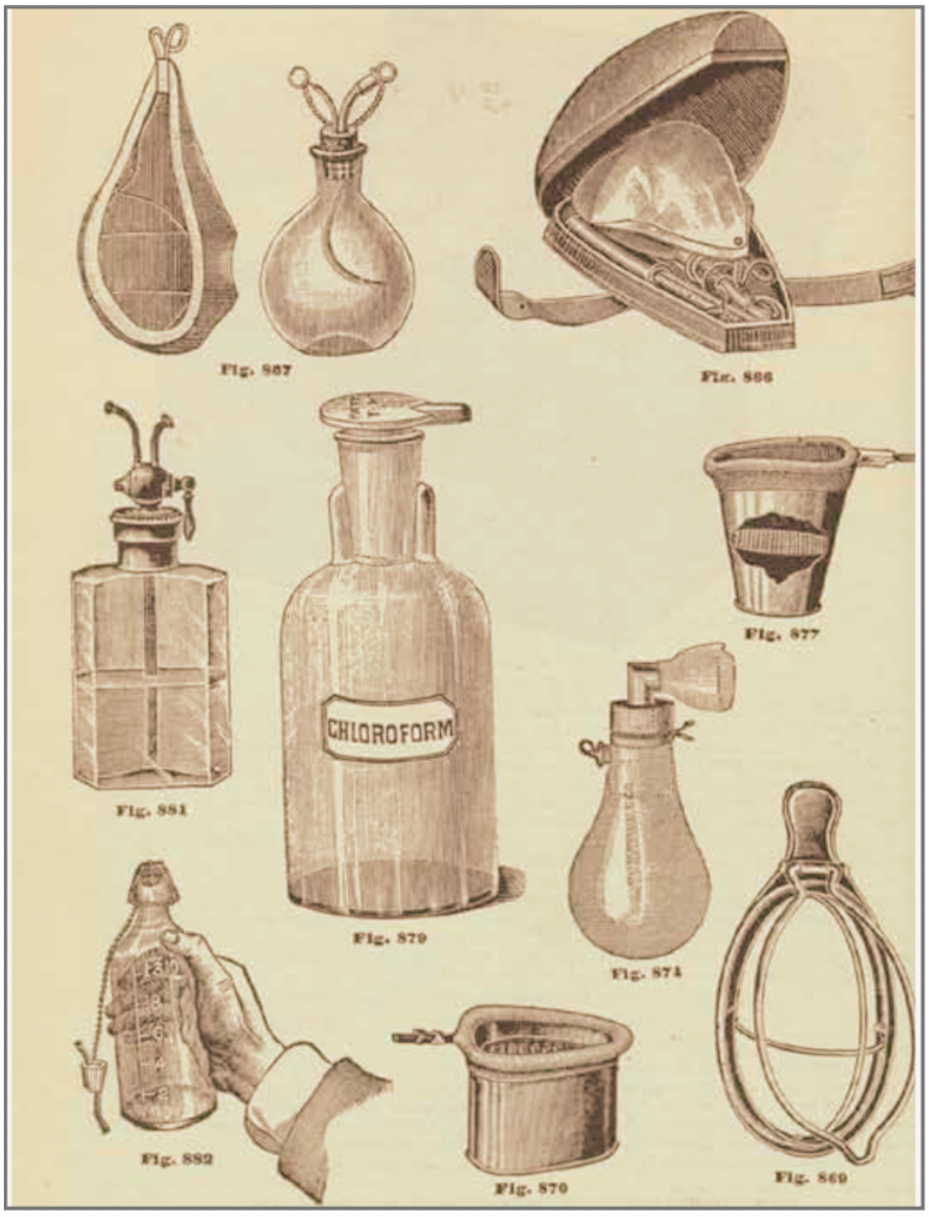
QUEEN'S UNIVERSITY

47th Annual Anesthesiology Research Day



Supported by the Galway Visiting Lectureship

FRIDAY APRIL 17, 2026
DONALD GORDON CENTRE
KINGSTON, ONTARIO

Queen's University
47th Annual Anesthesiology Research Day

Scientific Program Director and Residency Research Coordinator:
Ian Gilron, MD, MSc, FRCPC

Research Day Co-moderators:
Sarah Maxwell, MD, FRCPC **Yannis Amador Godoy,** MD

Queen's University Judges:
Louie Wang, MD, MSc, FRCPC **Cara Reimer**, MD, FRCPC

The Galway Visiting Lecturer: **Angela Jerath,** MD, MSc, FRCPC, FANZCA

Department Head:
Ramiro Arellano, MD, MSc, FRCPC

Research Committee Chair:
Ian Gilron, MD, MSc, FRCPC

Research Day Administrator:
Sabrina Clark

Clinical Research Director:
Tarit Saha, MD, MSc, FRCPC

Research Facilitator:
Rachel Phelan, MSc

Research Coordinator:
Debbie DuMerton, RN, CCRP

Research Coordinator:
Hala Elkerdawy, MD

Research Coordinator:
Grace Pavlatos-Jones, RN, CCRP

Research Coordinator:
Swati Gurbhele, MSc

Research Coordinator:
Nikit Mahale, MBBS, MPH

Institutional support:
• Queen's University • Kingston Health Sciences Centre (KGH & HDH Sites) • Providence Care

Held on April 17, 2026 – Donald Gordon Centre, Kingston, Ontario, Canada.

Funded by Educational Support from:

The Galway Visiting
Lectureship

Program booklet cover design
by Nicole Richardson, PhD

SCIENTIFIC PROGRAM OUTLINE

0800 – 0805 **Opening Remarks**

– Dr. Ramiro Arellano

0805 – 0815 **Research Day Introduction**

– Dr. Ian Gilron

Oral presentations – order of presentations to be announced

0815 – 0945 **Oral presentations (6)**

0945 – 1015 **Wellness break**

1015 – 1200 **Oral presentations (7)**

1200 – 1245 **Lunch on site**

1245 – 1400 **Oral presentations (5)**

1400 – 1415 **Wellness break**

1415 – 1500 **Oral presentations (3)**

EACH 10-MINUTE ORAL PRESENTATION WILL BE FOLLOWED BY A 5-MINUTE QUESTION PERIOD

The Queen's Judges will be:

***Dr. Louie Wang*,** Queen's Dept of Anesthesiology & Perioperative Medicine

***Dr. Cara Reimer*,** Queen's Dept of Anesthesiology & Perioperative Medicine

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1500 – 1600 ***Dr. Angela Jerath*,** Associate Professor, Department of Anesthesiology & Pain Medicine, University of Toronto

* Guest Lecture *

"Does your perioperative team matter? Physician identity and surgical outcomes"

Wine & Cheese to follow with * Awards Presentation * (Donald Gordon Center)

Oral Presentations (alphabetical order)

Danielle Bourgeois-Lapiccirella, PGY-3
"Investigating usage and reducing wastage of nitrous oxide at Kingston General Hospital: a quality improvement initiative"

Alex Branco, PGY-2
"Exploring the Psychological Impact of Awake Intubation: A Scoping Review of the Current Literature"

Milena Bullen, PGY-3
"The Development and Implementation of a Knowledge Translation Fellowship Program in Low- and Middle-Income Countries"

Stephanie Chevrier, PGY-4
"Remote Learning and Supervision of Ultrasound-Guided Nerve Blocks"

Derek Dionne, PGY-5
"Feasibility trial of remotely delivered prehabilitation program in colorectal cancer patients"

Geoffrey Kerr, PGY-1
"Continuous vital signs monitoring using a novel, non-invasive ambulatory monitor to detect and prevent perioperative cardiovascular complications during early recovery from non-cardiac surgery"

Jocelyn Kerr, PGY-1
"Enhancing Informed Consent for Caesarean Delivery: Development of a Patient Education Pamphlet on Anaesthetic Options"

Eileen Kim, PGY-2
"Intermittent Bolus Versus Continuous Infusion for Local Anesthetic Delivery in Plane Block Catheters: A Systematic Review"

Luka Kremic, PGY-1
"A pilot study of preoperative cognitive behavioral therapy for patients with depressive symptoms undergoing ovarian cytoreductive surgery"

Dawson Lafleur, PGY-5
"Central Line Tutor - Update and Conclusion"

Noah Letofsky, PGY-4
“Oxygen insufflation through flexible bronchoscope working channel for visualization during airway foreign body extraction”

Landon Montag, BSc, MSc, Queen’s MD Candidate
“Who’s Checking the Blindfold? A Review of Blinding Assessment Practices in Pharmacotherapy & Neuromodulation RCTs for Neuropathic Pain in Adults”

Jessica Morris, PGY-1
“The Evaluation of a Knowledge Translation Fellowship Program in Low and Middle-Income Countries”

Michael Pierce, PGY-2
“SPontaneously Breathing Intubated Thoracic Surgery (SPITS) Study Update”

Hallie Prescott, PGY-2
“Regional Anesthesia for High-Risk Rib Fractures: Assessing Bleeding Risk in Coagulopathic Patients Receiving ESP Blocks”

Tyler Pretty, PGY-1
“Direct and Video Laryngoscopy in Airway Education: Current Practices and Attitudes Among Anesthesia Preceptors and Residents”

Pat Price, PGY-3
“Perioperative Factors Influencing Early and Late Sternal Wound Infections in Cardiac Surgery Patients: A Retrospective Cohort Study”

Katie Root-Clarke, NP-PHC, PhD Candidate (Queen’s Nursing)
“Psychedelics in Chronic Pain”

Michel Vezarov, BSc, Queen’s MD Candidate
“Best Practices for Perioperative Bleeding Management in Adult Cardiac Surgery: A Modified Delphi Consensus”

Jingxuan Zhang, MSc, PhD Candidate (Queen’s Management)
“Post-Discharge Remote Patient Monitoring for Cardiac Surgery Patients”

Poster Presentations

Joshua Aube	**PRehabilitation In advance of Major Elective surgery (PRIME): A pilot randomized controlled trial protocol"**
Adrianne Kamerman	**Theory-Informed Coaching to Enhance Prehabilitation Adherence: A Sub-Study of ADAPT-OC**
Laura Nixon	**Assessing Delivery Approaches for Prehabilitation Trials in Ovarian Cancer: Adherence and Cardiorespiratory Fitness within ADAPT-OC**
Katie Root-Clarke Shelby Lee	**Establishment of a Spinal Cord Stimulator Program, lessons learned**
Katie Root-Clarke	**EmPOWERing Primary Care to use Digital Health Tools for Chronic Pain**
Betty Zhang	**Perioperative Non-Aspirin NSAID Administration, Analgesic Efficacy, Safety, and Complications in Patients Undergoing Open Heart Surgery: A Systematic Review of Randomized Controlled Trials**

Investigating usage and reducing wastage of nitrous oxide at Kingston Health Sciences Centre: a quality improvement initiative

Danielle Bourgeois-Lapiccirella, Dr. Christopher Haley and Dr. Jessica Burjorjee

BACKGROUND:

Nitrous oxide (N2O) has a significant impact on our environment. Its atmospheric life is approximately 120 years, with a global warming potential of 265[1]. Hospitals that have previously investigated their piped nitrous oxide systems have determined that a significant proportion of nitrous oxide is wasted, while only a small amount is used clinically. The source of waste can be leaks within the piped system, over-ordering, stock expiration, and theft, among others[2,3]. N2O wastage from leaks is so ubiquitous that multiple societies, including the Canadian Anesthesiologists Society, have recommended the "elimination of nitrous oxide pipelines in Canadian healthcare facilities"[4].

PRELIMINARY RESULTS:

In the spring of 2024, we surveyed the department of Anesthesiology at KGH using a qualitative survey and found that clinical usage of nitrous oxide was low. N2O is mainly being used for pediatric inductions, c/sections under general anesthetic, and to facilitate difficult IV starts in anxious patients. We proceeded to a quantitative audit of both purchased N2O and clinical use of N2O at the KGH site and found that over a 17-week period, 22 K-tanks of N2O were purchased at KGH (338,000 litres), while our clinical usage audits of the anesthesia machines showed that we use approximately 500 litres per week, accounting for 8500 litres usage over a 17-week period. This equates to 2.5% of our supply being used clinically, with 97.5% wasted.

In September of 2025, we successfully decommissioned the nitrous oxide pipeline both at KGH and Hotel Dieu Hospital (HDH).

This presentation will focus on the activities we undertook to achieve this accomplishment, as well as lessons learned and new data to determine if we are meeting our stated metrics.

REFERENCES:

1. Open Anesthesia. *Environmental Impact of Nitrous Oxide.* OpenAnesthesia.org. Updated May 2023. Accessed March 2024. https://www.openanesthesia.org/keywords/environmental-impact-of-nitrous-oxide/?search_term=nitrous%20oxide
2. YouTube. (2021, January 27). *Nitrous Oxide Mitigation: Launching the UK and Roi National Audit*. YouTube. https://www.youtube.com/watch?v=OreKYfF0d8s
3. Centre for Sustainable Healthcare. *The Nitrous Oxide Project*. (2022, April 21). Accessed March 2024. https://sustainablehealthcare.org.uk/what-we-do/sustainable-specialties/anaesthetics/nitrous-oxide-project
4. Canadian Anesthesiologists' Society. *Canadian Anesthesiologists' Society (CAS) Background Paper for the CAS Position Statement on reducing harmful emissions, waste and costs.* (2024).

Exploring the Psychological Impact of Awake Intubation: A Scoping Review of Current Literature

Name: Alex Branco, PGY2
Supervisor: Dr. Daenis Camire
Collaborators: Jason Thompson (PGY2), Cheyan Athanasiou (MS4), Courtney Svab (Health Sciences Librarian)

Background: Awake intubations have the potential to reduce morbidity and mortality in patients with anatomically and/or physiologically difficult airways [1,2]. While the procedure is often the safest option in certain clinical situations, its psychological impact, specifically the development of post-traumatic stress disorder (PTSD), remains underexplored. Existing literature on this topic is limited, highlighting a significant knowledge gap regarding the patient experience of awake intubation.

Objective: This scoping review aims to provide an overview of the current literature on whether patients develop PTSD after awake intubation in ED, OR, or ICU settings. We seek to identify key themes, methodologies, and gaps in research that will inform the design of a prospective observational study.

Methods: A preliminary literature search identified 20 articles related to patient experiences around awake intubation. A comprehensive literature search was conducted across multiple databases, including Embase, MEDLINE, Web of Science, and Scopus, in collaboration with a research librarian. Following title and abstract screening, 1,368 studies were independently screened by two reviewers, with discrepancies resolved by a third reviewer. A total of 397 studies were selected for full-text review, which is currently underway. The primary outcomes of this review include patient experiences surrounding awake intubation, particularly incidence of PTSD or acute stress responses, as well as rates of recall following awake intubation, and the types of medications that are used to supplement local anesthetics (e.g. opioids, sedatives). Secondary outcomes include the skill level of the operator and the screening tool that is used to evaluate the patient experience

Results and Discussion: We hope that this review will provide valuable insights into the psychological consequences of awake intubation and highlight the need for further research on PTSD in this patient population. The findings will serve as the foundation for a future prospective observational study, where we plan to interview patients using a validated PTSD screening tool after experiencing awake intubation.

Conclusion: To be determined

References:

1. Apfelbaum, J. L., Hagberg, C. A., Connis, R. T., Abdelmalak, B. B., Agarkar, M., Dutton, R. P., Fiadjoe, J. E., Greif, R., Klock, P. A., Mercier, D., Myatra, S. N., O'Sullivan, E. P., Rosenblatt, W. H., Sorbello, M., & Tung, A. (2021). 2022 American Society of Anesthesiologists Practice Guidelines for management of the difficult airway *. *Anesthesiology*, *136*(1), 31–81. https://doi.org/10.1097/aln.0000000000004002

2. Mosier, J., Joshi, R., Hypes, C., Pacheco, G., Valenzuela, T., & Sakles, J. (2015). The physiologically difficult airway. *Western Journal of Emergency Medicine*, *16*(7), 1109–1117. https://doi.org/10.5811/westjem.2015.8.27467

The Development and Implementation of a Knowledge Translation Fellowship Program in Anesthesiology and Pain Management for Low- and Middle-Income Countries

Presenters: Dr. Milena Bullen & Dr. Jessica Morris **Supervisors:** Dr. Joel Parlow & Dr. Gregory Klar
Collaborators: Dr. Ana Johnson, Dr. Gaston Nyirigira, Dr. Paulin Banguti, Dr. Francoise Nizeyimana, Dr. Dylan Bould, Dr. Jon Bailey, Dr. Christopher Haley, Heidi Simpson

Partnerships: Queen's University Departments of Anesthesiology and Perioperative Medicine and Public Health Sciences, the University of Rwanda Department of Anesthesiology and Critical Care, the Canadian Anesthesiologists' Society International Education Foundation, Dalhousie University Department of Anesthesia, Pain Management & Perioperative Medicine, and the Royal College of Physicians and Surgeons of Canada.
Funding: This fellowship received three years of funding from an International Development, Aid and Collaboration (IDAC) grant provided by the Royal College Canada International (RCCI).

Aim: The Knowledge Translation Fellowship Program aims to enhance the clinical application of current evidence in Rwandan perioperative care, through postgraduate medical education and faculty development.
Methods: An admissions process is completed to select two practicing anesthesiologists as fellows per year. Each fellow is assigned one Rwandan and one Canadian anesthesiologist mentor whose training background and research interest align with the fellow's chosen field of interest. The fellowship consists of a two-month didactic training component, where the fellows travel to Canada to learn the foundations of knowledge translation, quality improvement, and quantitative and qualitative research methods through training in the clinical environment, lectures, interactive workshops, seminars, and online modules. While in Canada, fellows collaborate with their mentors to outline a proposal for a knowledge translation/quality improvement project. Fellows then return to Rwanda to implement these projects on a part-time basis back at their home institution. Fellows who have completed the program are encouraged to mentor incoming cohorts of fellows to help support the sustainability of the program.
Preliminary Results: Over the course of three years, six fellows will graduate from the program. During the first year of the program, a regional anesthesia block room was created to enable the provision of pre-operative regional anesthesia at the Kigali University Teaching Hospital. Concurrently, an analysis was completed to determine opportunities and barriers for the sustainability of a local cardiac surgery program in Rwanda. The projects developed by the second cohort of fellows include the development of a pediatric anesthesia fellowship program in Rwanda, and a study to evaluate and enhance awareness of the diagnosis and management of chronic pain in rural hospitals in Rwanda. The third cohort of two fellows are currently developing projects in obstetric anesthesia and acute pain management.
Update: A formal evaluation process is currently underway. The analysis is guided by a theory of change approach that outlines the pathways through which program activities potentially influenced fellows' professional development. This approach is structured by Guskey's Five-Level Framework [1] to evaluate outcomes across multiple levels using questionnaires and semi-structured qualitative interviews.
Next steps: Plan to complete the data collection and qualitative analysis for the program evaluation prior to manuscript writing.
Conclusion: Providing knowledge translation training and mentorship to physicians can lead to sustainable changes in clinical care, allowing physicians to critically evaluate their current practices, identify local needs and barriers to care, and develop and implement responses to the identified problems. The goals of this approach are to develop and improve evidence-based clinical practices, promote retention of trainees in Rwanda and empower individuals to become local champions of change. This fellowship provides the tools for physicians in LMICs to develop and continuously evaluate and improve their impactful work for years to come.

References:

1. Guskey T. Does it make a difference? Evaluating professional development. 2011. *Journal of Educational Leadership.* 59:45-51.

Remote Learning and Supervision of Ultrasound-Guided Nerve Blocks

Stephanie Chevrier, Glenio Mizubuti, Greg Klar, Ian Gilron, Rachel Phelan, Sandra McKeown

Background: Ultrasound-guided regional analgesia (UGRA) improves patient safety, reduces opioid use, shortens hospital length of stay and enhances patient satisfaction. However, its widespread adoption remains limited by challenges in training and access to expert supervision. Synchronous remote supervision has emerged as a potential strategy to address these barriers, yet its feasibility and effectiveness in facilitating UGRA delivery remains unclear.
Study Purpose: To evaluate the current literature on synchronous remote learning and supervision of ultrasound-guided nerve blocks, and to gain insight into the feasibility of this method as a tool for teaching UGRA.

Design and Methods: A systematic review was conducted across Embase, MEDLINE, Web of Science, Cochrane and Preprint Citation Index. Studies involving medical trainees or physicians receiving synchronous remote supervision or teaching for UGRA were included. Asynchronous and didactic-only interventions were excluded. Of 1,566 articles identified, 30 underwent full-text review and 2 studies met strict inclusion criteria.

Results: Only 2 studies met inclusion criteria, both of which were feasibility-focused and evaluated synchronous remote teaching of UGRA in distinct settings. One study demonstrated that real-time remote supervision could effectively guide learners through ultrasound image acquisition and needle positioning, with high learner satisfaction. The second study, conducted in a low-resource setting, showed that telesimulation-based instruction improved learner confidence and supported skill acquisition. Sample sizes were small and study designs heterogeneous. Across both studies, outcomes were limited to feasibility and short-term educational metrics. There was a lack of standardized outcome measures, and neither study assessed clinically meaningful endpoints.

Conclusion: The current literature provides limited evidence supporting the feasibility of synchronous remote supervision for ultrasound-guided nerve blocks, and is insufficient to determine its effectiveness or safety. The scarcity of eligible studies, absence of standardized outcomes and lack of clinically meaningful data represents a significant gap in the literature. Given the potential for remote supervision to address training barriers and expand access to regional anesthesia, this gap is highly relevant to contemporary clinical practice. Future research should prioritize well-designed prospective and randomized studies evaluating clinical outcomes, safety and implementation. As ultrasound and telesimulation technologies continue to evolve, rigorous investigations will be essential to define the role of remote supervision in facilitating safe, effective and equitable delivery of regional anesthesia.

A PREHABILITATION PILOT TRIAL: EVALUATING FEASIBILITY OF HOME-BASED TRIMODAL PREHABILITATION PROGRAM FOR COLORECTAL CANCER PATIENTS

Presenter: Derek Dionne. **Supervisor:** Jordan Leitch
Collaborators: Choi, Selim. Laroque, Benjamin. Van Vlymen, Janet. Jaeger, Melanie.
Funding: Clinical Teachers' Association of Queen's (CTAQ) grant.

BACKGROUND: Surgical interventions for colorectal cancer represent significant physical and psychological stressors for patients, often leading to functional decline and postoperative morbidity. Prehabilitation has garnered increasing interest as a strategy to mitigate these adverse outcomes. However, there remains a need for high-quality studies to determine the most effective regimens and feasible delivery models, particularly for home-based approaches. This pilot trial investigates the feasibility of a remotely monitored, home-based trimodal prehabilitation program for colorectal cancer patients.

METHODS: A feasibility pilot trial was conducted at KHSC using a parallel arm, unblinded randomized control design. Patients aged 18 years or greater booked to undergo major colorectal surgery are enrolled to gather a sample size of n = 20. Study participants were randomized, by alternating allocation, into 2 different groups: 1) Prehabilitation with twice-weekly progress checks and 2) Prehabilitation with no check-ins. The prehabilitation program was based on prior trimodal programs, lasted 4-6 weeks prior to surgery, included aerobic and strength training exercises, protein supplementation and dietary goals, and breathwork activities. Adherence rates along with daily activities were tracked using a remote monitoring system, CloudDX. Initial questionnaires were also given via this platform. The primary objective was to assess the feasibility of integrating this program into existing pre-operative care infrastructure, focusing on adherence and completion.

RESULTS: Twenty-six patients were enrolled and consented to the prehabilitation program, twenty of which completed the program, split between the check-in (n=9) and control group (n=11). Despite a lack of statistical significance, the check-in group trended towards higher compliance with daily activity tracking (66.1% vs. 44.4%), breathing exercises (57.7% vs. 38.9%), and achieving individual protein goals (77.8% vs. 55.6%) compared to the control group. Greater variability in strength and cardiovascular training, as well as protein supplementation intake, was observed in the control group. The study demonstrated that half of colorectal cancer patients were able to complete our prehabilitation program with or without check-in using the CloudDX platform.

CONCLUSION: The findings suggest that such a program is feasible and that regular check-ins may positively influence patient adherence, especially for tracking activities and specific program components. This trial to serve as a springboard for a large scale, multi-centre randomized control trial utilizing the Cloud DX platform to ultimately inform a rational roll-out of a patient-driven, physician supported prehabilitation program at KHSC that can improve our patients' physical and mental recovery as the progress through their perioperative journey. Further research is needed with a larger population to make significant conclusions.

Continuous Ambulatory Vital Signs Monitoring to Detect Missed Postoperative Physiologic Instability Following Major Non-Cardiac Surgery

Geoffrey Kerr, Joel Parlow, Wiley Chung, Deborah DuMerton, Jordan Leitch

Background:

Myocardial injury after non-cardiac surgery (MINS) is a common and clinically significant postoperative complication, affecting approximately 8% of patients and is strongly associated with increased 30-day mortality. Most events are thought to result from an imbalance in myocardial oxygen supply and demand, often triggered by physiologic disturbances such as hypotension, tachycardia, and hypoxia. While continuous monitoring is standard intraoperatively and in the post-anesthesia care unit, patients on surgical wards typically undergo intermittent vital signs assessment, creating a critical gap in detection of physiologic instability during early recovery.

Objective:

To determine the extent to which continuous ambulatory monitoring detects abnormal hemodynamic and oxygenation events that are missed by standard nurse-measured postoperative vital signs.

Methods:

This is a prospective, single-centre observational study conducted at Kingston General Hospital. A total goal of 440 adult patients undergoing major non-cardiac surgery and meeting high-risk criteria for perioperative cardiac complications will be enrolled. Participants will receive standard perioperative care with the addition of a non-invasive wearable monitor (Vitaliti™) applied postoperatively for up to 72 hours. Continuous physiologic data including heart rate, blood pressure, oxygen saturation, respiratory rate, and ECG will be collected but remain blinded to clinical teams.

The primary outcome is the number, duration, and frequency of abnormal physiologic events detected by continuous monitoring compared to standard intermittent vital signs. Secondary outcomes include feasibility metrics such as recruitment rate and data completeness, patient satisfaction, perioperative biomarkers including BNP and troponin, ECG findings, and 30-day major adverse cardiac events. Exploratory analyses will assess the relationship between the burden of abnormal events and postoperative complications, including MINS.

Significance:

This study addresses a key gap in postoperative care by quantifying the extent of undetected physiologic instability on surgical wards. Findings will inform the feasibility and design of future interventional trials evaluating whether continuous monitoring and early detection can reduce postoperative complications. Ultimately, this work aims to improve patient safety and modernize postoperative surveillance through scalable, non-invasive monitoring technology.

Funding: This work is supported by the Southeastern Ontario Academic Medical Organization (SEAMO)

Enhancing Informed Consent for Caesarean Delivery: Development of a Patient Education Pamphlet on Anesthetic Options

Name: Jocelyn Kerr, PGY1; Supervisor: Dr. Jessica Burjorjee

BACKGROUND: Caesarean section rates are rising globally, yet many women remain inadequately informed about their anesthetic options, contributing to preoperative anxiety and uncertainty in decision making.[1] Studies have identified significant gaps in the informed consent process, including patients often not being provided balanced information about all available anesthetic techniques.[2] A recent systematic review by Charles et al. (2025) reported that up to 17% of patients experience intraoperative pain during caesarean delivery under neuraxial anesthesia. This highlights the importance of preparing patients with realistic expectations about their anesthetic experience.[3] Recognizing these challenges, the American Society of Anesthesiologists has issued statements emphasizing the need to address pain during caesarean delivery and to provide psychological support for obstetric patients, underscoring the role of preoperative education in maternal well-being.[4, 5] Structured preoperative education has been shown to improve patient knowledge, reduce anxiety, and support confident participation in anesthetic decision-making.[6, 1] However, many interventions require dedicated resources. A written pamphlet distributed during routine prenatal visits offers a scalable, low-cost alternative to empower patients in shared decision-making.

OBJECTIVE: To develop and implement an evidence-based patient education pamphlet on anesthetic options for caesarean delivery to enhance informed consent, reduce preoperative anxiety, and empower patients in shared decision-making.

PROPOSED METHODS: A pamphlet will be developed through literature review and multidisciplinary expert consultation, presenting balanced information on spinal, epidural, and general anesthesia in lay language with visual illustrations. Content will include realistic expectations regarding intraoperative sensations and pain management.[3] The pamphlet will be distributed to women during prenatal care, and its impact on knowledge, anxiety, and confidence in decision-making will be evaluated.

ANTICIPATED OUTCOMES: Based on existing evidence, we anticipate the pamphlet will improve understanding of anesthetic options, set realistic expectations, reduce perioperative anxiety, and increase patient confidence in making informed choices about their care.

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Title: Intermittent Bolus Versus Continuous Infusion for Local Anesthetic Delivery in Plane Block Catheters: A Systematic Review

Dr. Eileen Kim; Supervisor: Dr. Theunis Van Zyl

Background: Plane block catheters are increasingly used for postoperative analgesia due to their versatility and favourable safety profile. Despite widespread adoption, the optimal strategy for local anesthetic delivery through these catheters remains uncertain. Prior systematic reviews comparing the efficacy of intermittent bolus (IB) versus continuous infusion (CI) have focused predominantly on peripheral nerve block catheters, with limited attention to plane block techniques. Recently, multiple prospective studies evaluating IB versus CI regimen in plane block catheters have emerged, alongside growing interest in patient recovery outcome metrics. This systematic review aims to synthesize the current evidence comparing IB and CI delivery strategies specifically for plane block catheters, with a focus on postoperative pain control and patient recovery outcome metrics.

Methods: This systematic review was conducted in accordance with PRISMA guidelines and a prespecified protocol registered on the Open Science Framework. MEDLINE, EMBASE, and the CENTRAL databases were searched from inception through June 2025. Prospective studies and randomized controlled trials comparing IB and CI regimens for plane block catheters in adult surgical patients were included. Primary outcomes were postoperative pain scores (VAS or NRS) and patient recovery outcome metrics, including the Quality of Recovery-15 (QoR-15) score. Secondary outcomes included postoperative opioid consumption, time to discharge from the post-anesthesia care unit, hospital length of stay, sensory block levels, and block-related complications. Study selection, data extraction, and risk-of-bias assessment were performed independently by two reviewers, with disagreements resolved by consensus. Risk of bias was assessed using the Cochrane RoB 2 tool. Due to substantial clinical and methodological heterogeneity, results were synthesized descriptively.

Results: Sixteen prospective studies comprising 876 patients met inclusion criteria. Most trials were small scale, with 10 of 16 (63%) studies enrolling 65 or fewer participants. Paravertebral blocks were the most frequently studied plane block (six trials), followed by erector spinae plane (four trials) and transversus abdominis plane blocks (two trials); other plane blocks evaluated in single studies included quadrates lumborum, serrates anterior, intercostal, and pecto-intercostal blocks. Pain scores were reported in 13 studies, of which three (23%) demonstrated statistically significant reductions favoring IB, while one (8%) favoured CI. Postoperative opioid consumption was reported in 13 studies, with three (23%) showing lower opioid requirements in the IB group. Recovery outcomes were infrequently assessed: only two studies reported QoR-15 scores, with one demonstrating a significant benefit with IB. Block-related complications were uncommon and inconsistently reported.

Conclusions: The body of evidence evaluating IB versus CI for plane block catheters has expanded since earlier reviews, yet remains limited by small sample sizes and heterogeneity in block type and outcome reporting. While IB appears safe and may confer analgesic or opioid-sparing benefits in select plane block techniques, consistent advantages across plane blocks and outcomes have not been demonstrated. Notably, patient recovery outcome metrics remain under-utilized. Future research should prioritize adequately powered, block-specific trials incorporating standardized recovery outcomes to better define the role of intermittent bolus strategies in plane block analgesia.

A pilot randomized study of preoperative elective cognitive behavioral Therapy for patients with depressive symptoms undergoing ovarian cytoreductive surgery

Luka Kremic, Jordan Leitch

Background: Ovarian cancer is associated with a substantial psychological burden with clinically significant depressive symptoms in approximately one-third of patients. Depressive symptoms carry meaningful prognostic implications across surgical populations such as greater mortality, postoperative pain, incidence of delirium, surgical specific complications and prolonged hospitalization. Despite these associations, depression is rarely screened for or addressed as part of routine perioperative care.

Brief CBT programs of four to six sessions can produce clinically meaningful reductions in depressive symptoms and are feasible within time-constrained clinical contexts. Preoperative CBT represents a targeted strategy to address patients with clinically significant depression by providing a structured psychological intervention for this population who currently lack an optimization pathway.

Study Design: This study will be conducted as a pilot, randomized, non-blinded, parallel-group trial. Eligible participants will include women with ovarian cancer scheduled to undergo cytoreductive surgery at Kingston Health Sciences Centre who screen positive for depressive symptoms, defined as a Hospital Anxiety and Depression Scale–Depression subscale (HADS-D) score of eight or greater. Participants in intervention arm will receive a brief, structured virtual CBT program consisting of four to six sessions delivered during the preoperative period. Participants randomized to the control arm will receive usual perioperative care as per institutional standards.

Outcomes: The primary outcome of this study will be feasibility and acceptability of the CBT intervention. Feasibility will be assessed through recruitment and consent rates, intervention adherence, session completion, and attrition. Acceptability will be explored through qualitative feedback from patients and healthcare providers regarding perceived benefit, barriers to participation, and overall experience. Secondary outcomes will be exploratory and include changes in depressive symptoms as measured by the HADS-D from baseline to four weeks postoperatively. Additional clinical outcomes will include hospital length of stay, thirty-day hospital readmission, thirty-day emergency department presentation, and surgery-to-chemotherapy interval where applicable.

Next steps: This pilot will provide the foundational evidence needed to inform the design of a future adequately powered randomized controlled trial evaluating the efficacy of preoperative CBT in this population. Ultimately, this research aims to establish psychological optimization as a routine component of perioperative care for patients with depression undergoing major oncologic surgery, a group for whom no structured intervention pathway currently exists.

Central Line Tutor – Grande Finale: Computer Vision-Based Learning System for Practicing Central Venous Catheterization

Dawson Lafleur (presenter), Rebecca Hisey, Denise Wong, Daenis Camire, Gabor Fichtinger, Tamas Ungi, Daniel Howes, Jason Erb (supervisor)

Background: Simulation-based tools are being increasingly incorporated into medical training. Simulation models allow for the repetitive practice of invasive medical procedures without direct risk to patients. A common resource limitation in simulation teaching is the requirement for expert clinicians to teach and supervise learners practicing their skills. Central venous catheterization (CVC) is a commonly performed invasive procedure often taught to medical learners through simulation models. Computer vision-based systems and artificial intelligence can potentially analyze and recognize the steps involved in simulation procedures and provide feedback to learners [1, 2].

Purpose: This study aims to assess a novel computer vision-based system, Central Line Tutor, as an independent CVC practice system that does not require an expert supervisor. The system uses video-based workflow recognition, 2D ultrasound, electromagnetic tracking and 3D modelling to provide learners with real-time instruction and feedback.

Hypothesis: Participants who practice CVC insertion with the tutor system will achieve CVC insertion competency faster than traditional practice using a checklist, ultrasound and mannequin.

Study design: Undergraduate medical students and residents from Queen's University were recruited. Consented participants were randomized to either use the full tutor system with active feedback and 3D modelling, or conventional system with only ultrasound and non-interactive checklist. All participants received an educational video on performing internal jugular venous cannulation and a copy of the procedural checklist prior to performing 11 trials. Recordings were obtained from trials for both groups. Performance of CVC was assessed in each group by blinded expert evaluators using a previously validated scoring system adapted to video supervision [3]. Participants completed a questionnaire documenting their level of training, previous experience and feedback on the simulator.

Progress: 56 medical students, 7 residents, 6 anesthesiologists were recruited. CVC insertion trials were recorded then evaluated independently by four reviewers. Subjective analysis of performance was similar between the two groups, however there was a trend toward reduced needle punctures and redirections in the intervention group. Survey results were reviewed showing potential areas of improvement for the system. Reviewers also provided time stamps for the beginning and completion of procedure steps which may be used to further train the simulator.

Challenges: Durability of the mannequin, introduction of air into the mannequin, and applicability of validated scoring systems to remote scoring may have contributed to difficulty with differentiating participants on subjective measures.

Future considerations: Performance data and time stamping may be used to further refine the system and improve feedback to users.

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Oxygen insufflation through flexible bronchoscope working channel for visualization during airway foreign body extraction

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Case Report; Supervisor: Dr. Theunis Van Zyl

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Flexible fiberoptic bronchoscopes (FFBs) have been used for decades for airway diagnostic and therapeutic procedures. Traditionally, FFBs have a light source, a lens, as well as a "working channel", used for suction, instillation of local anesthetic or saline, or use of tools (ex. Biopsy forceps).

We present a case of a 68-year-old, morbidly obese (BMI 45 kg/m2) female patient with obstructive pneumonia secondary to aspiration of a dislodged dental cap presenting to the operating room for foreign body removal. The patient presented a challenge due to their oxygen requirements prior to the procedure as well as severe obstructive sleep apnea and morbid obesity. Anesthesia was induced and maintained using the strive-hi protocol1 utilizing propofol target controlled infusion to obviate the need for positive pressure ventilation, topical lidocaine sprayed to the airway, and 100%, 70 L/min inspired oxygen was delivered via OptiflowTM hi-flow nasal cannula. The airway obstruction was distal in the lateral basilar segmental bronchi of the left lower lobe, and visualization was difficult with dynamic airway collapse on suctioning to clear secretions. A trial of intermittent oxygen insufflation through the working channel was utilized to improve oxygenation and visualization to facilitate retrieval of the obstructing foreign body, which proved successful with no immediate or late complications identified.

Use of oxygen through the FFB working channel dates to the 1980s as a strategy to prevent soiling of the lens and prevent desaturation during fiberoptic intubation.2 Literature on this topic is sparse, and we could not find reports of utilizing oxygen through the working channel during bronchoscopy below the carina nor literature on its use for improving visualization. While complications are possible and must be considered, oxygen insufflation through the working channel of a FFB may be a useful option in difficult visualization situations for airway therapeutic procedures below the carina. The risks and benefits of this decision should be carefully evaluated in consultation with the proceduralist and anesthesiology team.

Express patient consent was obtained for the production and presentation of this case.

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Who's Checking the Blindfold? A Review of Blinding Assessment Practices in Pharmacotherapy & Neuromodulation RCTs for Neuropathic Pain in Adults

Presenter: Landon T. Montag, MS2
Supervisor: Dr. Ian Gilron

Collaborators: Nadia Soliman, Xavier Moisset, Michael C. Ferraro, Daniel Ciampi de Andrade, Ralf Baron, Joletta Belton, David L. H. Bennett, Margarita Calvo, Patrick M. Dougherty, Aki J. Hietaharju, Koichi Hosomi, Peter R. Kamerman, Harriet Kemp, Elena K. Enax-Krumova, Ewan McNicol, Theodore J. Price, Srinivasa N. Raja, Andrew S. C. Rice, Blair H. Smith, Fiona Talkington, Andrea Truini, Jan Vollert, Nadine Attal, Nanna B. Finnerup, Simon Haroutounian, Luana Colloca, Lene Vase, Tim V. Salomons, Ramla Abuukar Abdullahi, Matthew Evans, Sascha Freigang, Bethany Gwyther, David Hohenschurz-Schmidt, Gabriel Taricani Kubota, Jules Phalip, Harrison Phillips, Tjokorda Istri Pramitasuri, Cristina Ramirez Piriz, Augustus Rottenberg, Nina Taule-Lim, Quyen V. Than, Jan D. Wandrey, Claire Wang, Andreas Zachariadis, Md Zunaid

Introduction: In randomized controlled trials (RCTs), study participants and research personnel are often blinded to minimize bias related to knowing treatment allocation. To determine if blinding was effective, participants and research personnel may be asked at the end of the study which treatment they believe they received ("treatment guess").

Methods: We conducted a descriptive review to characterize blinding assessment (BA) and its reporting in pharmacotherapy and neuromodulation neuropathic pain RCTs.

Results: Of 290 studies, 37 (13%) reported a BA. Of these studies, 19 were crossover, 17 parallel, and 1 partial crossover in design. Most were single site studies (57%) and received non-industry funding (68%). 27% included an 'unsure' answer option for participants' treatment guess, and 38% asked the reason for the treatment guess. There were no clear trends in BA reporting across time nor based on treatment type. 15/37 studies provided sufficient data to calculate Bang's Blinding Index (BI) to determine blinding success. Blinding was effective (BI=0 ±0.2) in 10/15 placebo and 10/15 treatment arms, suggesting that participants guessed no better than chance. 6 placebo and 5 treatment arms trended towards unblinding (BI>0.2), whereas 1 placebo and 2 treatment arms trended towards misinformed guessing (BI<-0.2).

Conclusions: Overall, our findings suggest that BA is done in a minority of neuropathic pain trials, and with variable methodology. Given the importance of minimizing risk of bias due to treatment unblinding, further research and consensus building is necessary to determine if and/or how BA should be conducted and interpreted in analgesic clinical trials.

SPontaneously Breathing Intubated Thoracic Surgery (SPITS): A Prospective Observational Feasibility Study

Presenter: Dr. Michael Pierce
Co-supervisors: Dr. Daenis Camire and Dr. Anthony Ho
Collaborators: Dr. Milena Bullen and Dr. Andrew Giles
Funding: None

Background: Non-intubated thoracic surgery (NITS) reduces ventilator-associated lung injury, postoperative pulmonary complications, and hospital length of stay compared to conventional intubated VATS, but carries a conversion rate of up to 11% and excludes patients with difficult airways, significant comorbidities, or hemodynamic instability.[1,2] We contend that these benefits derive primarily from the preservation of spontaneous ventilation and avoidance of neuromuscular blockade, rather than from the avoidance of intubation itself. Spontaneous ventilation with double-lumen tube intubation (SVI) has demonstrated feasibility in over 140 cases,[4] but large-calibre double-lumen tubes impose substantial airway resistance.

We have developed **SP**ontaneously Breathing **I**ntubated **T**horacic **S**urgery (**SPITS**), combining the physiologic benefits of spontaneous ventilation with the safety of a pre-emptively secured airway. Using the STRIVE-Hi protocol,[3] patients are induced and intubated with a large single-lumen ETT while maintaining spontaneous respiration. An Arndt bronchial blocker is pre-loaded through the Murphy eye of the ETT and positioned in the target mainstem bronchus — deflated throughout, but immediately deployable for lung isolation or hemorrhage control if required. This minimizes intra-ETT resistance while preserving rapid-transition capability to positive pressure ventilation.

Methods: Prospective, observational feasibility study. Adults undergoing elective VATS are eligible when deemed appropriate by both surgical and anesthesia teams. Key exclusion criteria include: age <18 years, elevated intracranial pressure, severe emphysema or hemi-diaphragmatic paresis, BMI ≥40 kg/m², hemodynamic instability, right heart failure, or any condition requiring immediate lung isolation. Anesthesia is maintained with propofol TCI (Sedline PSI 20–30) with carefully titrated remifentanil to preserve respiratory drive. Multimodal analgesia includes acetaminophen, NSAIDs, ketamine, magnesium sulfate, and surgical regional anesthesia. Serial ABGs are collected at four timepoints: preoperative baseline, intraoperative steady state, post-resection, and 30 min post-PACU arrival.

Primary outcomes: procedure completion without conversion to PPV/neuromuscular blockade; intraoperative SpO_2/PaO_2 and $ETCO_2/PaCO_2$; number of airway interventions required. **Secondary outcomes:** OR/procedural time, conversion to open thoracotomy, reoperation, time to PACU discharge (Aldrete ≥9), unplanned ICU admission, hospital length of stay.

Results: Ethics approval has been obtained. Enrollment is underway; two patients have provided informed consent and are awaiting surgical scheduling. Outcomes will be reported as cases are completed.

Conclusions and Future Plans: SPITS extends the benefits of spontaneous ventilation to patients historically excluded from NITS by securing the airway in advance with a pre-positioned, rapidly deployable bronchial blocker. Pending demonstration of feasibility and safety, a comparative trial against conventional intubated VATS is planned.

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Regional Anesthesia for High-Risk Rib Fractures: Assessing Bleeding Risk in Anticoagulated Patients Receiving ESP Blocks

Name: Dr. Hallie Prescott; Supervisor: Dr. Theunis van Zyl
Collaborators: Dr. Glenio Mizubuti, Dr. Gregory Klar, Dr. Anthony Ho,

Background: Effective analgesia for rib fracture(s) is critical in reducing complications and mortality, particularly in elderly patients. Common management strategies include opioid-based intravenous patient-controlled analgesia (IV-PCA), thoracic epidurals, and peripheral nerve blocks. While thoracic epidurals have been shown to provide superior analgesia1 as well as opioid-sparing benefits, they are contraindicated in anticoagulated patients due to the risk of epidural hematomas. Erector spinae plane (ESP) blocks have emerged as an alternative regional technique; however, there is a lack of evidence evaluating the safety of regional anesthesia in anticoagulated patients. Small observational studies and case reports have commented on the use of ESP blocks in anticoagulated patients with rib-fractures analgesia with no increased rate of bleeding complications.2-3 Similarly, a retrospective observational study of ESP and fascial plane blocks in anticoagulated patients undergoing cardiac surgery—who are at high risk for bleeding—did not demonstrate an increased incidence of bleeding complications associated with regional anesthesia.4 Our institution has implemented a rib fracture analgesia protocol prioritizing regional anesthesia for high-risk patients, with the goal of optimizing pain control while balancing potential bleeding risks. As a result, we have a patient population that can be observed to evaluate the safety of ESP blocks in anticoagulated patients and test this hypothesis.

Results:
Ninety-nine patients were included (30 anticoagulated/coagulopathic; 69 controls). No clinically significant bleeding complications or neurological deficits occurred. Minor superficial catheter-site bleeding occurred in five patients (2 vs 3), requiring no intervention or anticoagulation changes. No cases of local anesthetic toxicity, infection, or anticoagulation reversal were observed. Secondary outcomes were similar between groups.

Conclusions:
ESP blocks were not associated with clinically significant bleeding in anticoagulated or coagulopathic patients, with outcomes comparable to controls. Minor bleeding was rare and clinically insignificant. ESP blocks may be a safe alternative when neuraxial techniques are contraindicated. Prospective studies are needed.

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Project Title: Direct and Video Laryngoscopy in Airway Education: Current Practices and Attitudes Among Anesthesia Preceptors and Residents

RESEARCH TEAM: Dr. Tyler Pretty, MD, BScN, PGY1-Anesthesiology, Dr. Glenio Mizubuti, Dr. Daenis Camire, Dr. Anthony Ho, Ms. Rachel Phelan, MSc.

BACKGROUND: Video laryngoscopy (VL) is increasingly recommended as the primary modality for endotracheal intubation and is now widely available in operating rooms1,2. Despite this shift, direct laryngoscopy (DL) remains a critical airway management skill, particularly in situations where VL fails or is unavailable. The educational impact of widespread VL adoption on anesthesia training, however, has not been well studied. Reduced exposure to DL during residency may lead to declining trainee confidence and competence with this foundational technique.

METHODS: We propose a national cross-sectional survey of anesthesia residents and staff anesthesiologists across Canadian residency programs to characterize current airway management practices, educational approaches, and attitudes toward DL and VL training.

OUTCOMES: Quantitative analyses will evaluate two co-primary outcomes: (1) the proportion of staff and residents identifying VL as their first-line intubation device, and (2) perceived decline in opportunities for DL practice during training. Secondary outcomes include resident confidence in DL, perceived barriers to DL training, and current educational strategies for airway management in the era of VL.

CONCLUSIONS: This study will address an important knowledge gap in anesthesia education and may identify emerging deficiencies in training for a core airway skill. Findings will inform future airway education strategies and curriculum development within Canadian anesthesia programs and may support broader discussions regarding competency standards for airway management in the modern VL era.

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Perioperative Factors Influencing Early and Late Sternal Wound Infections in Cardiac Surgery Patients: A Retrospective Cohort Study

Presenter: Dr. Pat Price
Supervisor: Dr. Joel Parlow

Sternal wound infections (SWIs) remain a significant complication following cardiac surgery, with substantial impacts on patient outcomes and healthcare resources. This research aims to investigate the perioperative factors influencing SWI development using multivariable logistic regression. Our study will further categorize sternal wound infections into superficial and deep types, as well as those identified during the immediate postoperative period versus those diagnosed after 30 days. The goal is to identify differential risk factors between these categories to guide targeted treatment, improved surveillance, and effective risk stratification strategies.

Psychedelics in Chronic Pain

Presenter: Katie Root-Clarke, NP-PHC, PhD (student)

Queen's Faculty Research Supervisor: Dr Rosemary Wilson; Site Specific: Dr David Clinkard; PI: Dr Akash Goel (St Michael's Hospital)

Background and Rationale

Chronic neuropathic pain (CNP) is a persistent, debilitating condition affecting 1 in 10 Canadians. It carries a massive economic burden and is notoriously refractory to first-line treatments like opioids, anticonvulsants, and antidepressants. Given the high psychological component to chronic pain, methods to target both the neural aspects as well as the underlying pain pathways are promising. 3,4-Methylenedioxymethamphetamine (MDMA) has emerged as a highly promising therapeutic alternative as it inhibits the reuptake of serotonin, norepinephrine, and dopamine. Emerging clinical evidence demonstrates that MDMA-AT is associated with significant, sustained reductions in chronic pain severity and disability.

Study Design and Methodology

The EASE-PAIN (Ecstasy to Alleviate SEvere chronic neuropathic pain) study, Protocol P-006, is a Phase II, randomized, triple-blinded, active-placebo-controlled pilot feasibility trial. The study will enroll 40 adults with moderate-to-severe, treatment-refractory chronic neuropathic pain (CNP). Participants will be randomized in a 1:1 ratio to receive either a single oral dose of MDMA or methylphenidate. The 16-week intervention combines pharmacologic treatment with a structured psychotherapeutic framework, including preparatory sessions, supported in-person dosing, and four post-dosing integration sessions.

Objectives and Outcomes

The primary objective is to evaluate the feasibility of launching a subsequent full-scale, multi-centre trial. Primary endpoints focus on recruitment success (averaging ≥1 participant per center per month), while secondary feasibility outcomes assess data completion rates, blinding integrity, patient retention, and safety (tracking adverse events). Secondary clinical efficacy outcomes will measure improvements at 16 weeks in pain interference (PROMIS-PI), pain intensity, physical and emotional functioning, and overall quality of life.

Best Practices for Perioperative Bleeding Management in Adult Cardiac Surgery: A Modified Delphi Consensus

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Introduction:

Perioperative bleeding remains a major source of morbidity in adult cardiac surgery. Although several guidelines exist (e.g., 2024 EACTS/EACTAIC recommendations)1, substantial variation in perioperative practice remains. Existing guidelines provide broad, evidence-based recommendations, but are limited by variability in institutional resources, regional practice patterns, and gaps in high-quality clinical trial evidence. Therefore, a modified Delphi approach was used to achieve expert consensus where evidence is limited or practices vary. This study aims to convene a multidisciplinary expert panel to develop practical best-practice statements for bleeding management in adult cardiac surgery, informed by existing guidelines (e.g., STS/SCA/AmSECT/SABM guidelines)2, clinical trials, and expert consensus.

Methods:

This is a modified Delphi study. Draft statements were initially developed and pre-reviewed by a multidisciplinary panel of eight experts, organized by perioperative phase. A larger multidisciplinary panel of approximately 40 experts in cardiac anesthesiology, cardiac surgery, transfusion medicine/hematology, and perfusion will evaluate the statements. Panelists were purposively sampled to ensure disciplinary, gender, and regional balance. The process includes two rounds, with a third conducted only if prespecified consensus criteria are unmet. Statements are rated on a 7-point Likert scale (completely disagree to completely agree) with optional free-text comments. Inclusion consensus is defined as an interquartile range ≤1.5 with ≥70% of ratings in the 5–7 range; exclusion is defined as ≥70% of ratings in the 1–3 range. Only clarifying edits are permitted between rounds.

Results (in progress):

This study is ongoing. The steering group developed 27 draft statements based on existing guidelines and local protocols, which were reviewed and refined with input from all authors. The study is now entering the first Delphi round. Primary outcomes include the consensus status of each statement (include, exclude, or no consensus) and the proportion of statements achieving consensus by the final round. The results will inform future guideline development and identify areas of uncertainty to guide research and quality improvement efforts.

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Funding:

We have applied to the Dr. Alison B. Froese Research Fund and are awaiting a decision.

Post-Discharge Remote Patient Monitoring for Cardiac Surgery Patients

Jingxuan Zhang
Research Supervisor - Vedat Verter
Collaborators – Jordan Leitch, Kardi Kennedy, Alexandra MacKinnon, Rod Albrough

Post-discharge care is a means for reducing avoidable emergency department (ED) visits and hospital readmissions. Building on the connected health paradigm, we develop a post-discharge risk modeling framework using remote physiological monitoring data to predict cardiac surgery patients' likelihood of presenting back at the ED and being re-hospitalized in real time. The core contribution lies in transforming high-frequency home-monitoring data into clinically interpretable temporal features and embedding them within an explainable yet scalable modeling pipeline. Methodologically, the work bridges statistical inference and machine learning by combining selected variables for explanation with predictive benchmarks for deployment. Our findings on data from a local tertiary hospital highlight strong effects of prior event history and short-window physiological instability in post-discharge risk formation. By organizing remote measurements into adaptive recovery cycles, this structure supports earlier recognition of deterioration patterns, offering a practical pathway for translating connected health data into proactive care delivery.

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