College of Health Sciences
Faculty of Medicine & Dentistry
Anesthesiology & Pain Medicine

UNIVERSITY OF ALBERTA

15th ANNUAL GELFAN AND BELL

ANESTHESIOLOGY CONTINUING EDUCATION AND RESEARCH SYMPOSIUM

Friday May 22, 2026
Maple Leaf Room - Lister Centre

This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification (MOC) program of the Royal College of Physicians and Surgeons of Canada and approved by the Division of Continuing Medical Education, College of Medicine, University of Saskatchewan. You may claim a maximum of 3.75 hours (credits are automatically calculated).

Abstracts

Oral Presentations

Symposium Learning Objectives:
Research Day provides the opportunity for our grad students, residents, and fellows to demonstrate and measure their progress. At the conclusion of this program, participants will be equipped to explain and apply knowledge using current anesthesiology related research and scholarly activities that have taken place in Edmonton over the past year.

Infusion Propofol and Remifentanil versus Bolus Propofol and Dexmedetomidine for Sedation for MRI Head in Pediatric Patients

Presenter: Dr. Ian Armstrong[1]
Additional author(s): Dr. Mancho Ing[1]
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Introduction:
Sedation for pediatric MRI head imaging is utilized to facilitate high-quality imaging in this population. Propofol/remifentanil infusion is commonly used at the Stollery Children's Hospital for this. A novel bolus propofol/dexmedetomidine technique has emerged with potential advantages, such as lower environmental footprint, fewer respiratory side effects, and ease of administration.

Design and Methods:
This single-center, retrospective cohort study analyzed 51 pediatric anesthetic charts in children who presented to the Stollery Children's Hospital between September and December 2023 for MRI head imaging. The aim was to compare propofol/remifentanil infusion with bolus propofol/dexmedetomidine sedation in children aged 6 months to 12 years undergoing this imaging. Patient charts were randomly selected and grouped by sedation technique with 26 charts having received propofol/dexmedetomidine and 25 having received propofol/remifentanil.

Intervention(s) and Outcome Measures:
Charts were assessed for the primary study outcomes. The primary outcomes recorded include rates of oxygen desaturation, cardiovascular instability, additional bolus sedation medication usage, total recovery room time, total anesthetic time, rate of emergence delirium, and reported movement artifact on imaging. Statistical analyses included Fisher's exact test and two-sample t-tests.

Results:
No significant difference was observed in oxygen desaturation, cardiovascular instability, recovery room time or total anesthetic time between groups. Emergence delirium and movement artifact rates were zero in both groups. Notably, additional bolus medication use was significantly lower in the Propofol/Remifentanil group (12.0% vs 53.85%; p=0.002), with an odds ratio of 0.12 (95% CI, 0.03–0.49).

Conclusions:
The bolus propofol/dexmedetomidine technique demonstrated similar safety profiles to propofol/remifentanil infusion sedation in pediatric MRI head cases but was associated with a higher need for additional bolus medication. It is notable that anesthetic and recovery times were not statistically different between groups. Further prospective studies are warranted to evaluate clinical implications and optimize sedation protocols.

Learning Objectives:
At the end of this session participants will be able to:
1. Compare efficacy and safety of Propofol/Remifentanil vs. Propofol Dexmedetomidine for MRI-head sedation in pediatric patients.
2. Assess the effect on anesthetic and recovery times depending on sedation used.
3. Analyze the effect of sedative choice on MRI workflow.

Two Pokes Too Many: Training, Education and Implementation of Nursing Performed Ultrasound Guided Intravenous Access at The University of Alberta

Presenter: Dr. Ryan Brenneis[1]
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Introduction:
Intravenous (IV) access is a necessity for nearly all hospital-based interventions and falls under the scope of nursing practice. Caring for patients with difficult IV access (DIVA) may lead to complications. Ultrasound guided IV access (USGIV) has been shown to be a reliable and effective way to establish IV access in DIVA patients, reduce attempts, and improve catheter dwell time all while reducing central venous access devices (CVAD) utilization.

Objectives:
To establish a program at the University of Alberta (UAH) to train nurses in USGIV, evaluate whether USGIV was successful in reducing IV attempts, and implement a framework to minimize IV attempts without US guidance in patients deemed to have DIVA.

Design and Methods:
A quality improvement initiative was undertaken to train medical emergency team (MET) nurses and clinical nurse educators (CNE) at the UAH on USGIV access. A QI team was formed to design and implement a DIVA workflow at the UAH hospital.

Intervention(s) and Outcome Measures:
Train MET nursing staff on USGIV as the primary method for IV insertion in patients with DIVA.
Train CNE's on surgical and medical wards on USGIV as an alternative to landmark based insertion.
Incorporate USGIV access within a DIVA workflow to become standard protocol for obtaining IV access at the University of Alberta.

Results:
70-90% of the MET nurse pool utilize USGIV as the intervention of choice on DIVA calls. The success rate for those utilizing USGIV versus landmark based IV access for DIVA patients was 79% versus 60%. Anesthesia activations for IV insertion dropped by approximately 250% indicating earlier success with IV cannulation.

Conclusions:
Nurses are able to effectively learn and perform USGIV. A DIV workflow incorporating USGIV access was published. USGIV appears to reduce the number of attempts to obtain IV access.

Learning Objectives:
At the end of this session participants will be able to:
1. Recognize the benefits of ultrasound technology to facilitate intravascular access.
2. Realize the steps to approach a quality improvement initiative.
3. Detects the pitfalls and barriers to utilization of ultrasound technology for vascular access.
4. Differentiate the pro's and con's of various intravascular access devices and techniques.

Pain management for hospitalized patients with rib fractures: A systematic review of randomized clinical trials

Presenter: Dr. Christine Chiu[1]
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Introduction:
Rib fractures are common injuries. Multiple analgesia strategies are available for treatment of pain associated with rib fractures. However, the optimal multimodal technique for pain management is not known. The primary aim of this review was to evaluate the status of evidence derived from randomized clinical trials on the effectiveness of pain management modalities for rib fracture pain.

Design and Methods:
Searches were conducted in MEDLINE, Embase, Scopus, and Cochrane Library. The screening process involved two phases, two researchers independently screened the title and abstract and subsequently screened full text. RCT data were extracted independently by two research team members. Consensus was achieved by comparison and discussion when needed. Risk of bias assessment was performed using the Cochrane Risk of Bias 2 tool.

Intervention(s) and Outcome Measures:
A variety of pain interventions for rib fractures were identified through this review including oral and IV analgesics, neuraxial techniques, peripheral nerve blocks and more. Studies that followed our criteria were further analysed primarily for pain outcomes. Secondary outcomes included ICU length of stay, hospital length of stay, mortality, and complications. Included studies were also evaluated for risk of bias.

Results:
A total of 1344 citations were identified. Title and abstract screening excluded 1128 citations, and full text review excluded 177 articles. A total of 32 RCTs were included in the full review. Multiple analgesia techniques and medications were identified and their effect on pain score and need for rescue opioid analgesia. None of the included studies were judged to have a high risk of bias, while only 10 studies were assessed as having a low risk of bias.

Conclusions:
This systematic review found that studies are of low quality with diverse methodologies and outcomes. A reduction in pain scores was found for epidural analgesia when compared with other modalities. However, the low quality of the evidence necessitates cautious interpretation of this finding.

Learning Objectives:
At the end of this session, participants will be able to summarize and compare existing rib fracture analgesia methods and recognize the limitations of the current literature.

Implementation of Erector Spinae Plane Block for Post-Operative Pain Management after The Nuss Procedure

Presenter: Dr. Jenelle Clark[1]
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Introduction:
The goal of this study was to compare an erector spinae plane block (ESPB) plus a patient-controlled analgesia (PCA) versus the previous institutional data of post-operative PCA following a Nuss procedure for pectus excavatum for reduction in post-operative opioid consumption. The amount of opioid consumed was to be collected from PCA pumps and recorded in weight-based morphine equivalents for the first 3 days.

Design and Methods:
This study was intended to be an observational case series with a sample size of 45 patients. The patients were males between 12-18 years. Exclusion criteria were: ASA greater than 3, previous history of bleeding diatheses, anticoagulation use, low platelets or abnormal bleeding parameters, preventing the patients from qualifying to safely receive the block.

Intervention(s) and Outcome Measures:
Patients receiving the ESPB were to be retrospectively matched to a cohort who used PCA following the Nuss procedure over a 24-month period. Each patient was set to receive bilateral ESPB using 0.25% Bupivacaine with a standardized dose of 0.3mL/kg to a maximum of 20mL per side. The target level was at transverse process 4 identifying the trapezius, rhomboids, and erector spinae muscles on ultrasound. The catheter was to be left in for 72 hours. Secondary outcomes included average Numerical Rating Scale (NRS) for postoperative pain, time to discharge, and frequency of opioid side effects.

Results and Conclusions:
To assess the efficacy of the ESPB on post-operative pain the study was going to measure: (1) qualitative responses using the NRS pain scale at 12-, 24-, 48-, and 72-hour mark and (2) quantitative data of how much systemic opioid is required. If the block was effective, we expected to see a decrease in systemic opioid use in the post-operative period as well as a reduction in the NRS documented by patients. Unfortunately, after ethics approval for the study was obtained a new protocol was implemented at the Stollery for all Nuss patients which includes intraoperative cryoablation performed by the surgeon. This study has since been discontinued.

Learning Objectives:
At the conclusion of this session, participants will be able to identify and describe the types of analgesia available for a Nuss procedure and what current institution standards are.

Lactate elevation in OHNS free-flap reconstruction surgeries

Presented By: Dr. Joshua Hahn[1]
Additional author(s): Paige Jamieson[2], Dania Villarreal[1], Dr. Fadi Hammal[1], Dr. Hadi Seikaly[3], Dr. Derek Dillane[1]
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Introduction:
The UAH hosts a world-leading program for reconstructive Otolaryngology, Head and Neck Surgery (OHNS) utilized in advanced head and neck cancers. It has been observed that during these cases, often exceeding 12 hours in length, there is commonly an elevation in lactate levels to values that would normally indicate a severe metabolic derangement. The prognostic significance of intraoperative hyperlactatemia is unknown. The objectives of this study were as follows:
1) Identify the incidence of lactate elevation is in this population;
2) Correlate lactate elevation with postoperative outcome;
3) Establish if there is a pattern between fluid administration and lactate elevation.

Design and methods:
Retrospective chart review of all adult OHNS reconstructive flap patients from November 2019 – May 2024. 655 charts were screened with a combination of manual chart review and database extraction. Data retrieved included patient characteristics and comorbidities, intraoperative labs and vitals, and postoperative course.

Intervention(s) and Outcome Measures:
Patients were classified into elevated (>2.2 mmol/L) or normal (≤2.2 mmol/L) intraoperative lactate groups with post-operative course evaluated based on this classification. Outcome measures included: postoperative vitals and interventions (CRRT, vasopressor use, hypoxemia, re-intubation), laboratory values (troponin, creatinine), and mortality up to 1 year after surgery.

Results:
Elevated intraoperative lactate levels were associated with higher BMI (27.2 ± 6.34 vs 25.8 ± 6.42 kg/m², p=0.007), male sex, non-smoking status, absence of respiratory disease, higher preoperative hemoglobin and albumin (all $p < 0.05$), and increased intraoperative crystalloid administration. In all groups, lactate normalized within 48 hrs with no differences in in-hospital mortality (10 [50%] vs 10 [50%]; p = 0.820), 30-day mortality (7 [70%] vs 3 [30%]; p = 0.358), 1-year mortality (90 [60%] vs 60 [40%]; p = 0.111), or hospital length of stay (22.1 ± 23.2 vs 24.0 ± 38.1 days; p = 0.261).

Conclusions:
A correlation between preoperative patient characteristics and elevated intraoperative lactate was found. However, there was no association between intraoperative lactate and postoperative outcome in this population of OHNS reconstructive surgery patients.

Learning Objectives:
At the end of this session, participants will be able to:
1. Identify patterns of lactate elevation in OHNS flap surgeries.
2. Identify risk factors for negative outcomes in this population.
3. Translate these results to their own clinical practice in assessing lactate elevation intraoperatively during OHNS flap surgeries.

Towards a Guide for Pre-operative Type & Screen: A Quality Improvement Study

Presenter: Dr. Jamie Hilland[1]
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Introduction:
Pre-operative type & screen's (T&S) are commonly completed in preparation for surgery; there is minimal guidance regarding which surgical procedures are high risk for requiring intra-operative blood transfusions. Transfusion requirements are unique to procedure, patient, and institution, which has prompted the development of maximum surgical blood ordering schedules (MSBOS). This provides a guide to which procedures should receive pre-operative T&S based on local practices. The objective of this quality improvement study is to create a local MSBOS aimed at eliminating unnecessary T&S and enhance resource management.

Design and Methods:
A retrospective chart review was performed using data from the University of Alberta Hospital (UAH) from November 2019-September 2022, and Royal Alexandra Hospital (RAH) from May 2022-June 2024. Inclusion criteria was elective surgery and pre-operative hemoglobin >120; 13789 patients at UAH and 65 097 patients at RAH were included. Procedures were grouped based on surgical bookings, and patients who received intra-operative blood transfusions were identified. Procedure specific transfusion rates were generated using these numbers. Based on MSBOS literature, a transfusion rate of 5% was used as the threshold to recommend completion of a pre-operative T&S.

Intervention(s) and Outcome Measures:
The intervention was type of surgery which was undertaken, and the outcome measured was intra-operative blood transfusion.

Results:
Procedures which had >5% transfusion rates included, general surgery: exploratory laparotomy, hepaticojejunostomy, pancreatectomy, pancreaticoduodenectomy, pelvic exenteration, open gastrectomy, retroperitoneal/pelvic mass excision. Neurosurgery: posterior fossa craniotomy, spinal fusion >4 levels. Plastic surgery: Repair facial trauma, hidradenitis excision. ENT: Facial/skull reconstruction, facial reconstruction with neck dissection, parotidectomy with neck dissection, laryngectomy, hardware removal. Urology: open adrenalectomy, open cystectomy, cystoprostectectomy, open radical nephrectomy, kidney transplant. Orthopedic Surgery: spinal fusion >4 levels, spinal tumour excision. Gynecology: Pelvic exenteration, staging laparotomy, exploratory laparotomy, C-HYS.Thoracic Surgery: Thymectomy (sternal), hemi-clamshell, chest wall excision.

Conclusions:
Based on local transfusion rates for elective surgical procedures at the UofA and RAH, an MSBOS could be used to optimally guide pre-operative T&S testing, optimizing hospital resources.

Learning Objectives:
At the end of this session, participants will be able to:
1. Describe benefits of having a local MSBOS.
2. Describe local rates of peri-operative transfusion.
3. Recognize the importance of a targeted approach to ordering pre-operative T&S and associated cost savings.

Anki Flashcards for Anesthesiology Residents' Retention of Knowledge: A Randomized Control Trial

Presenter: Dr. Kristina Jeon[1]
Additional author(s): Austin Ho[1], Dr. Nirupan Vipulananthan[2]
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Introduction:
Knowledge gained by a learner is easily and quickly forgotten, commonly described by Ebbinghaus' 'forgetting curve'. This phenomenon is effectively countered by the 'spacing effect'; subsequent re-learning can lead to slower forgetting rates over time. Technology like quiz banks and digital flashcards provide a streamlined approach to optimize knowledge acquisition; however, often asynchronous to the learners' unique curriculum. The primary aim of this study is to evaluate whether using curated educational tools with the Anki flash card platform in-synchrony with curriculum would improve knowledge retention amongst learners.

Design and Methods:
A total of 16 participants were voluntarily recruited from the PGY-1 and PGY-2 Anesthesiology and Pain Medicine and Family Practice Anesthesiology resident physician cohorts at the University of Alberta. Anki flashcard decks in various key topics were formulated by staff anesthesiologists and synchronized with the academic lecture curriculum.

Interventions and Outcome Measures:
Residents identities were blinded and randomly divided into Group A (n=8) and B (n=8); each received access to a different set of card topics (Topics A and B). Outcomes were obtained through comparing scores from a pre-test, post-test, as well as subjective pre- and post-study surveys.

Results:
Based on analysis from our first data set, there is a non-significant trend for higher mean delta scores amongst Group A learners (A 18.57%, B 1.43%, p=0.283), partly correlating to a higher proportion of Group A participants utilizing the flashcards. Pooled data demonstrates a statistically significant increase in delta scores between quizzes for Group-Topic matched questions (Q1 53.57% +/- 18.65%, Q2 68.57% +/- 17.03, p=0.043). The pre-study survey did not identify demographic differences between groups, although the post-study survey revealed more anesthesia rotations completed in Group A (A 12.20 +/- 5.40, B 3.25 +/- 0.50, p=0.014).

Conclusions:
Participants perceived Anki flashcards tailored to the curriculum effective, and a majority anticipated future use. Limitations include sample size and compliance. Future research should aim to improve motivation and utilization of synchronized spaced-repetition tools by learners.

Learning Objectives:
At the end of this presentation participants will be able to:
1. Describe the effect of spaced repetition in retention of knowledge.
2. Recognize the benefits of a synchronous spaced-repetition learning system.
3. Identify the real-life limitations and methods to support continued use of spaced-repetition tools by learners.

Perioperative Management of Breastfeeding Patients Undergoing Day Surgery

Presenter: Dr. Yasmin Valji[1]
Additional author(s): Dr. Jaime Sim[1]
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Introduction:
The perioperative period poses unique challenges for patients who are breastfeeding and undergoing day surgery. These may include separation from the baby, breast engorgement and mastitis, and inadequate pain control. Current guidelines recommend that the majority of patients be encouraged to resume breastfeeding as soon as they are awake and alert after surgery. However, some providers may routinely instruct breastfeeding patients to discard breast milk immediately after surgery. Additionally, there may be reluctance among practitioners to prescribe pain medication postoperatively. Our study aims to survey breastfeeding patients undergoing day surgery to determine the amount and quality of preoperative information they receive from healthcare providers.

Design and Methods:
After obtaining approval from our local ethics board, a survey was designed and distributed to breastfeeding patients undergoing day surgery at five local hospitals between November 2023 and August 2025. The survey was completed by patients prior to their day surgery procedure. The survey consisted of 10 multiple-choice questions that addressed: patient demographics, breastfeeding challenges, and perceptions of the amount and quality of information received from healthcare providers regarding perioperative breastfeeding management.

Results:
A total of 60 responses were received and analyzed. The majority of respondents (60%) reported experiencing challenges with breastfeeding, with the most common being painful engorgement (35%) and low supply (33%). 37% of respondents selected neutral, disagree or strongly disagree when asked if they were provided with sufficient information regarding managing breastfeeding around their operation. The majority of respondents (57%) still had questions about the perioperative management of breastfeeding before surgery, the most common being pumping and dumping (33%), painkiller safety (38%), and access to the baby (13%).

Conclusions:
Patients who are breastfeeding may benefit from standardized information, particularly focusing on topics such as resuming breastfeeding after surgery, pain management, and access to the baby. Future education initiatives could target surgical services, anesthesiologists, and nursing staff to ensure consistent knowledge of current breastfeeding best practices, which can then be disseminated to patients.

Learning Objectives:
At the end of this session participants will be able to describe future steps to improve the perioperative management of patients who are breastfeeding and undergoing day surgery.

Environmentally Sustainable Measures for Regional Anesthesiologists and Beyond: A Quality Improvement Initiative

Presenter: Dr. Tyeren Deacon[1]
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Introduction:
Imaging modalities used by the healthcare industry have a significant environmental impact and cost associated with their use. A report by Natural Resources Canada details that ultrasound machines are one of the top five most energy-consuming medical devices in hospitals. This quality improvement study aims to identify energy-saving strategies to decrease the impact of ultrasound usage at our institution. We hypothesized that turning the ultrasound machine off overnight and when not in use would significantly decrease the energy consumption.

Design and Methods:
Ethics was waived by our institutional research ethics board. Energy consumption data was collected by a portable data logger (ONSET HOBO®) connected to a single ultrasound machine (Sonosite LX®) in the hospital's regional nerve block room.

Intervention(s) and Outcome Measures:
As per usual practice in our department, the typical use of the ultrasound machine without energy-saving interventions was logged over three weeks (control). For the following four weeks, we implemented the energy-saving intervention by turning off the ultrasound machine when not in use (intervention). The primary outcome was energy consumption in kilowatt-hours (kWh) in both the control and the intervention group. The secondary outcomes were ultrasound machine usage and the energy cost.

Results:
After implementing the simple intervention of turning the machine off between scans and while not in use, we observed an 80% relative energy saving between the control and intervention group. Given that an average of 285.8g CO_2 is emitted per kWh of electricity consumed in Canada , the wastage was equivalent to 161.27kg CO_2 emissions per year. This yearly energy saving is equivalent to $108.344 for a single ultrasound machine.

Conclusions:
Actively switching off an ultrasound machine when not in use is a simple, convenient, and effective opportunity to significantly reduce energy consumption, minimize carbon footprint, and save costs. Taking into account the growing number of ultrasound machines in an average hospital, this represents a promising area for a simple intervention for planet health.

Learning Objectives:
At the end of this session participants will:
1. Identify the environmental impacts of delivering healthcare, particularly with respect to imaging modalities.
2. Employ interventions that can reduce our environmental footprint and reduce healthcare costs.

Developing a Post Operative Pathway for High-Risk Patients undergoing Tonsillectomy at the Stollery Children's Hospital

Presenter: Dr. Kylan McAskile[1]
Additional author(s): Dr. Graham Steel[1]
[1]Department of Anesthesiology & Pain Medicine, Faculty of Medicine & Dentistry, University of Alberta

Introduction:
Patients undergoing adenotonsillectomy are often admitted to high observation units for post operative care. Recent studies have demonstrated that after extended PACU observation (2-4 hours), that the majority of these patients can be admitted to regular inpatient beds.

Design and Methods:
We created a pathway for patients undergoing adenotonsillectomy that are currently booked for a high acuity bed postoperatively. This would include a stay in PACU of 2-4 hours and then reassessment using a standardized protocol by the surgical and anesthesia teams to see if appropriate for a regular inpatient bed.

Interventions and Outcome Measures:
Our plan is to implement this pathway over the next few months at the Stollery Children's Hospital for all Adenotonsillectomy patients booked for post operative PICU, PCICU and ICU Step Down beds. We will measure in 3, 6 and 12 months the impact of the extended PACU stay pathway on ICU admissions at the Stollery. We will also measure the amount of time the patients in the pathway spend in PACU, as well as any unanticipated ICU admissions.

Results:
There were 959 adenotonsillectomies completed at the Stollery in 2025. 32 patients were booked for admission. 15 were booked for high level observation (ICU Step Down, PICU or PICU). Currently the pathway has not been implemented so no data on the effectiveness exists now.

Conclusions:
Further data is pending the implementation of this pathway at the Stollery. If successful this hopefully could be applied to other surgical procedures for patients currently booked for ICU beds postoperatively, hopefully leading to more availability of an already scarce resource.

Learning Objectives:
At the end of this session participants will be able to:
1. Assess the utilization of PICU and High Observation Beds Post Adenotonsillectomy at the Stollery Children's Hospital.
2. Analyze the current post operative PACU length of stay of Adenotonsillectomy patients.
3. Propose a framework for an extended observation PACU stay for high-risk Adenotonsillectomy patients and determine if this reduces PICU admission.

Assessment of Right Ventricular Function in Patients Undergoing Left Ventricular Assist Device Implantation

Presenter: Dr. Mohammad Aljumah[1]
Additional author(s): Maira Machhiwala[2], Dr. Wing Lam[1], Dr. Surita Sidhu[1]
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Introduction:
Left ventricular assist devices (LVADs) improve quality of life in patients with end-stage heart failure. However, right ventricular (RV) failure occurs in 20-50% of LVAD recipients and leads to increased morbidity and mortality.1 Cardiac magnetic resonance imaging (cMRI) is considered the gold standard of measuring RV volumes and ejection.2 Three/four-dimensional analysis of perioperative LV/RV function in patients undergoing LVAD implantation using TEE-derived data may assist in the development of a reliable predictive RV failure risk score.3,4
The objective of this observational study is to determine whether RV parameters derived from perioperative echocardiography (3DE) are predictive of RV failure within the 14 day period following implantation of LVADs.5 These parameters would be analyzed using TomTec 4D LV/ RV-FUNCTION software.

Design and Methods:
This is an observational study of patients undergoing LVAD. Patients are included if they receive a HeartMate III or a Levitronix CentriMag LVAD. Patients will be excluded if: (1) sternal closure at the end of the procedure is not possible; or (2) RV mechanical support was introduced concurrently with LVAD implantation.
Consent will be obtained for study participation and use of information for research purposes including extraction of LV/RV volumetric data from 3D TEE as well as perioperative clinical data from the EMR. All patients will receive general anesthesia, invasive monitoring, a pulmonary catheter, and TEE study. 3D images of the LV and RV will be obtained at three points perioperatively; 1) during the post-induction period 2) within fifteen minutes of institution of LVAD and 3) post-chest closure. The 3D TEE RV data set will be exported to the Tomtec 4D LV/RV-Function software for offline analysis.

Results:
The team is in the process of analyzing the data.

Conclusions:
The team is in the process of analyzing the data.

Learning Objectives:
At the end of this session participants will be able to:
1. Recognize that based on reliable preoperative risk assessments, planned placement of a temporary right ventricular assist device in patients undergoing LVAD placement may attenuate the risk of RV failure.
2. Identify echocardiographic parameters that could reliably predict the risk of RV failure could have a profound effect on the perioperative course of these critically ill patients.

CV PAC Patient Satisfaction Survey: Quality Improvement Project

Presenter: Dr. Montana Johnston[1]
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Introduction:
Since the COVID-19 pandemic, all Cardiovascular Pre-Admission Clinic (CV PAC) appointments have transitioned to a virtual format. While teleconsultation offers clear benefits in accessibility and convenience, there has been no formal evaluation of patient satisfaction or assurance that patients are receiving the information and preparation they need prior to surgery. This quality improvement initiative aims to assess patient satisfaction with virtual PAC visits and identify opportunities to enhance the overall preoperative experience. The project focuses on three core objectives: (1) determining whether patients are satisfied with their tele consult appointments, (2) evaluating whether they receive all necessary pre-visit information, and (3) confirming that they complete all required components of the PAC process.

Design and Methods:
A structured, report-style telephone survey was administered to 150 patients by the end of 2024. This format, inspired by the validated PEPAC (Patient Experiences with Pre Admission Clinic) survey but adapted for telehealth, allows for richer qualitative feedback compared to traditional Likert-scale tools. While more time-intensive, narrative responses are expected to yield deeper insights into patient needs and actionable areas for improvement. Survey responses will be collected anonymously and analyzed to identify key themes, strengths, and gaps in our current processes. Findings will guide targeted interventions to improve patient experience and communication within the CV PAC. A follow-up evaluation will assess the impact of implemented changes, fostering an ongoing cycle of quality improvement and patient-centered care within the virtual PAC environment.

Intervention & Outcome Measures:
TBD

Results:
TBD

Conclusions:
TBD

Learning Objectives:
At the end of this session participants will be able to:
1. Identify whether patients received all the appropriate pre-visit information and recognize whether they were satisfied with their overall virtual CV-PAC experience with respect to their interaction with both nursing and anesthesia.
2. Analyze areas of strength which we can reinforce and potential gaps where we can implement improvements in our future tele consult patient interactions

GASTRIC-VR: Gastric Sonography Training for Anesthesia Residents Using Virtual Reality Versus Traditional Didactics: A Pilot Randomized Study Protocol

Presenter: Dr. Elizabeth Turner[1]
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Introduction:
Gastric point-of-care ultrasound (POCUS) is increasingly used in perioperative aspiration-risk assessment, yet there is no standardized approach to teaching this skill in anesthesia residency. Immersive virtual reality (VR) may offer advantages over conventional didactic teaching by better reproducing probe handling, spatial orientation, ergonomics, and real-time image acquisition. This pilot study was designed to compare VR-based instruction with traditional lecture-based teaching for gastric POCUS training in anesthesia residents.

Design and Methods:
This is a prospective, single-centre, parallel-group pilot randomized educational trial involving 20 anesthesia residents at the University of Alberta. Participants will be randomized 1:1 to either a 30-minute immersive 360° VR teaching module or a 30-minute recorded conventional didactic lecture covering equivalent gastric POCUS content. The primary outcome will be immediate post-intervention hands-on image acquisition performance measured using a structured Direct Observation of Procedural Skills (DOPS) tool. Secondary outcomes will include knowledge test performance, image interpretation accuracy, learner confidence, satisfaction, usability, feasibility metrics, and 12-week skill and knowledge retention. Faculty assessors will be blinded to group allocation.

Results:
Data collection has not yet commenced; therefore, results are pending and will be presented when available. We anticipate that residents trained with immersive VR will demonstrate improved hands-on acquisition performance relative to those receiving conventional didactic instruction, with possible additional gains in image interpretation, learner confidence, and satisfaction. We also expect this pilot to provide important feasibility data, including recruitment, adherence, assessor blinding, and acceptability of VR-based teaching, to support planning of a larger adequately powered trial.

Conclusions:
If VR-based instruction is associated with improved technical performance or learner engagement, it could represent a scalable and reproducible approach to gastric POCUS education within anesthesia residency training. Even if educational outcomes are similar between groups, the study will help clarify the feasibility and potential role of immersive teaching modalities in ultrasound education. This work may inform the development of more standardized, competency-based gastric POCUS curricula in anesthesiology.

Learning Objectives:

Acute Iatrogenic Hypernatremia Following Intraoperative 23.4% Hypertonic Saline Peritoneal Washout in a Liver Transplantation Candidate with Advanced Hepatic Alveolar Echinococcosis

Presenter: Dr. Abdulaziz Abualalaa[1]
Additional author(s): Dr. Ciaran Twomey[1]
[1]Department of Anesthesiology & Pain Medicine, Faculty of Medicine & Dentistry, University of Alberta

Introduction:
Echinococcus multilocularis-associated alveolar echinococcosis (AE) is a rare but life-threatening parasitic infection characterized by infiltrative hepatic growth that closely mimics primary hepatic malignancy in its biological behaviour. Advanced hepatic AE unamenable to surgical resection may necessitate liver transplantation (LT) as definitive management. Intraoperative peritoneal washout with hypertonic saline (HTS) is routinely employed as a scolicidal measure to prevent secondary peritoneal seeding following cyst exposure. Systemic absorption of concentrated HTS through the peritoneal membrane — which functions as a high-surface-area (1.7–2.0 m2) semipermeable dialysis membrane — has been associated with potentially fatal acute hypernatremia. To our knowledge, no prior case has documented this complication arising from 23.4% HTS in the context of liver transplantation surgery for hepatic AE.

Case Presentation:
A 32-year-old female from Saskatchewan was referred to the University of Alberta Hospital for liver transplantation assessment following advanced hepatic AE with near-complete replacement of the right hepatic lobe, segment 2 involvement, and extensive left intrahepatic biliary dilatation on MRCP, in the context of albendazole failure due to drug-induced hepatotoxicity and a determination of inoperability by the hepatopancreatobiliary surgery team. Pre-operative serum sodium was 128 mmol/L. During the surgical procedure, peritoneal washout with 23.4% HTS was performed as a scolicidal measure following intraoperative echinococcal material exposure, without concurrent intravenous sodium administration. Within 15–20 minutes, serum sodium rose acutely to 146 mmol/L (+18 mmol/L), accompanied by a concurrent chloride rise of approximately 10 mmol/L, consistent with rapid peritoneal NaCl absorption. Administration of 50 mL of 10% dextrose in water (D10W) corrected serum sodium to 135 mmol/L. The patient was extubated on postoperative day 1 with a Glasgow Coma Scale score of 15/15 and no neurological deficits.

Discussion:
This case represents a double clinical rarity: advanced hepatic AE necessitating LT assessment in a North American patient, and acute iatrogenic hypernatremia attributable to 23.4% HTS peritoneal contact in a liver transplantation setting, a combination not previously documented. The temporal relationship between peritoneal HTS exposure and the observed sodium rise, in the absence of any concurrent intravenous sodium source, implicates direct peritoneal absorption as the primary mechanism. Pre-existing hyponatremia, prevalent in advanced liver disease, amplified the absolute magnitude of the osmolar shift from physiological baseline. Unlike chronic hypernatremia, the acute iatrogenic nature of this event permitted prompt free-water correction (D10W) without the risk of cerebral oedema from idiogenic osmolyte adaptation. Published fatal cases of HTS-related hypernatremia in echinococcal surgery underscore the critical importance of continuous intraoperative sodium monitoring, peritoneal isolation techniques, and prospectively defined institutional protocols when HTS is employed in this context.

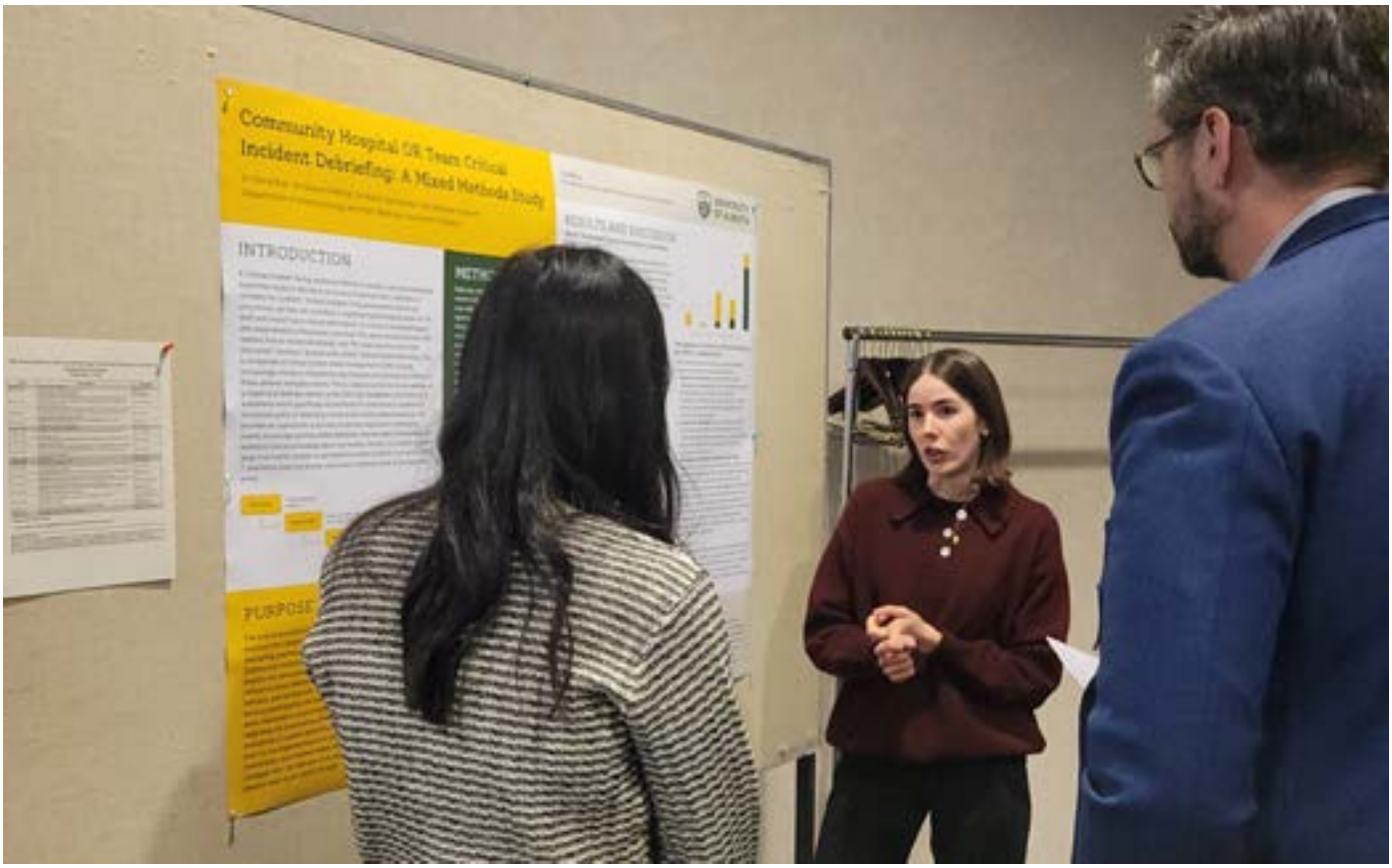
Conclusion:
Peritoneal contact with 23.4% HTS carries significant risk of rapid, life-threatening hypernatremia mediated by trans-peritoneal sodium absorption, particularly in patients with pre- existing sodium dysregulation secondary to advanced hepatic disease. Prompt recognition and administration of free water resulted in full neurological recovery in this case. Transplant centres in AE-endemic regions — including those in western Canada, where locally acquired AE cases are increasing — should develop explicit institutional protocols governing scolicidal agent selection, concentration limits, and mandatory intraoperative sodium monitoring. This case contributes to a limited but clinically important literature on the anaesthetic management of AE in liver transplantation.

Learning objectives:
At the conclusion of this session participants will be able to:

1. Describe the mechanism of trans-peritoneal sodium absorption following intraoperative hypertonic saline washout.
2. Distinguish between acute iatrogenic hypernatremia and chronic hypernatremia with respect to pathophysiology, clinical presentation, and correction strategy.
3. Appraise the necessity of aggressive peritoneal scolicidal washout in the specific context of liver transplantation where the native organ is being explanted.
4. Integrate published case literature with the present case to produce a comprehensive risk stratification framework for HTS use in abdominal echinococcal surgery.
5. Recommend a minimum standard of care for intraoperative electrolyte surveillance in transplant centres operating in AE-endemic regions.

Abstracts

Poster Presentations



Out of OR emergency airway management at the University of Alberta Hospital

Presenter: Dr. Jeronimo Chapur[1]
Additional author(s): Dr. Sunny Fong[1,2], Dr. Jocelyn Slemko[2]
[1]Department of Anesthesiology & Pain Medicine, Faculty of Medicine & Dentistry, University of Alberta
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Introduction:
The purpose of this study is to assess the general experience of emergent airway management outside of the operating room at the University of Alberta Hospital. We will be specifically asking staff physicians and residents in the services of anesthesiology, critical care, emergency medicine, general and trauma surgery, and otolaryngology head and neck surgery. Our goal is to identify any areas in the current system that could be improved including the communication system, mobilizing appropriate personnel, mobilizing the required equipment, and team dynamics.

Design and Methods:
This is a quality improvement survey. The survey will be distributed to all staff physicians and residents with clinical appointments at the University of Alberta hospital in the services of anesthesiology, critical care, emergency medicine, general and trauma surgery, and otolaryngology head and neck surgery. Participation is voluntary.

Intervention(s) and Outcome Measures:
There is no intervention. The survey responses will yield data that can infer how individuals feel about the current system for emergency airway management outside of the operating room and any areas of improvement.

Results:
TBD

Conclusions:
TBD

Learning Objectives:
At the conclusion of this session, participants will be able to:
1. Identify the different components involved in emergent airway management outside of the operating room.
2. Discuss the current evidence from implementation of difficult airway response teams in hospitals.
3. Describe the process of how emergent airways are currently managed at the University of Alberta Hospital.

In.C.A.S.E. You Didn't Hear: Intraoperative Assessment of Anesthesiologists' Noise Exposure

Presenter: Dr. Nathan Gollner[1]
Additional author(s): Richard Mah[1], Ali Hassan[2], Kayla Sage[2], Eric Lui[2], Elenna LaPlante[2], James Thompson-Dick[2], Bernadette Quemerais[3], Dr. Simone Derzi[1]
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Introduction:
Anesthesiologists manage multiple intraoperative responsibilities vital to patient stability and safety. Auditory alarms play a critical role in supporting this complex process. Operating rooms are high-noise environments, with sounds generated from multiple sources. Prolonged occupational noise exposure may compromise performance, communication, and the ability to detect auditory cues.
Occupational noise exposure is regulated in Canada, and the Alberta Occupational Health and Safety (OHS) Code provides specific exposure limits. Previous studies demonstrate that operating room noise frequently exceeds recommended thresholds; however, few studies have quantified cumulative exposure among anesthesiologists across multiple surgical specialties. This study aims to evaluate intraoperative noise exposure in anesthesiologists and compare with provincial occupational safety standards. We hypothesize that cumulative noise exposure in operating rooms of our hospital exceeds the occupational limits outlined in Alberta's Occupational Health and Safety Code.

Design and Methods:
This cross-sectional observational study quantifies noise exposure in adult, pediatric, and cardiac surgery operating rooms in a large tertiary hospital over a predetermined collection schedule and compares them to provincial standards.

Intervention(s) and Outcome Measures:
Calibrated digital sound level meters positioned near anesthesia workstations collected continuous A-weighted noise data during full operating days across multiple surgical specialties. The primary outcome is to measure operating room noise levels and determine whether they comply with Alberta Occupational Health and Safety standards. Secondary outcomes include identifying high-risk surgical environments, determining peak exposure periods, and characterizing variability in noise exposure across specialties.

Results:
A large dataset of intraoperative noise exposure across multiple specialties has been obtained. Final statistical analyses are ongoing

Conclusions:
This study will provide baseline data that may inform workplace safety initiatives and guide targeted interventions to reduce noise exposure and improve operating room safety.

Learning Objectives:
At the conclusion of this session, participants will be able to:
1. Explain methods used to measure and quantify occupational noise exposure in operating rooms.
2. Review Alberta's Occupational Health and Safety (OHS) Code, including recommended exposure limits for workplace noise.
3. Interpret cumulative intraoperative noise exposure data among anesthesiologists across multiple surgical specialties and assess compliance with provincial safety standards.
4. Identify operating room settings and time periods associated with higher noise exposure and discuss potential implications for occupational safety and patient care.

Association between intraoperative lactate levels during oral head and neck reconstructive surgery and postoperative morbidity and mortality

Presenter: Paige Jamieson[2]
Additional author(s): Joshua Hahn[1] Dania Villarreal[1], Dr. Fadi Hammal[1], Hadi Seikaly[3], Dr. Derek Dillane[1]
[1]Department of Anesthesiology & Pain Medicine, Faculty of Medicine & Dentistry, University of Alberta
[2]Faculty of Medicine & Dentistry, University of Alberta
[3]Department of Surgery, Division of Otolaryngology Head and Neck Surgery

Introduction:
Oncoplastic head and neck cancer resection with microvascular free flap reconstruction often proceeds for upwards of 18 hours. The prolonged anesthetic exposure and physiological stress of these cases can produce intraoperative hyperlactatemia, occasionally at life-threatening levels. In oncoplastic oral head and neck surgery (OHNS) patients, evidence demonstrating an association between intraoperative blood lactate and postoperative outcomes remains limited and inconsistent. To determine whether elevated intraoperative lactate is associated with postoperative mortality, morbidity, ICU admission, or length of stay, and to characterize associated intraoperative fluid administration patterns.

Design and Methods:
Retrospective study of OHNS patients ≥18 years undergoing microvascular free flap reconstruction at University of Alberta Hospital between November 2019 and May 2024 (n=625). Peak intraoperative lactate, used to group patients as Normal (≤2.2 mmol/L, n=339) or High (>2.2 mmol/L, n=286).

Intervention(s) and Outcome Measures:
Postoperative mortality, morbidity, ICU admission, length of stay, and intraoperative fluid volumes. Group comparisons used t-tests and chi-square. Fluid volumes were modelled using linear regression with log- and square-root transformation; predicted values were back-transformed, and exponentiated coefficients were expressed as percent changes in fluid volume. Significance: $p<0.05$ (SPSS v29.0).

Results:
Peak intraoperative lactate was higher in the High lactate group (4.4 ± 1.0 vs 1.0 ± 0.3 mmol/L, $p<0.001$), confirmed by mixed-effects modeling. Lactate normalized by 24-48 hours (mean difference=0.12 mmol/L, $p=0.479$). High lactate patients received more crystalloid (5.00 ± 2.45 vs 4.35 ± 2.61 mL/kg/h, $p<0.001$), had greater ASA class ($p=0.02$), and increased comorbidity burden. Univariate analyses showed no association between intraoperative lactate and postoperative outcomes: in hospital death ($p=0.820$), 30-day mortality ($p=0.358$), 1-year mortality ($p=0.111$), and length of stay ($p=0.261$).

Conclusions:
Although elevated intraoperative lactate was associated with perioperative risk factors and fluid requirements, hyperlactatemia resolved within 48 hours and was not independently predictive of adverse outcomes in OHNS free flap patients.

Learning Objectives:
At the conclusion of this session, participants will be able to:
1. Identify the clinical course of intraoperative hyperlactatemia and recognize factors associated with elevated intraoperative lactate in OHNS oncoplastic free flap patients.
2. Determine the relationship between intraoperative lactate and postoperative outcomes, including mortality, morbidity, ICU admission, and length of stay.

Examining the sex specific contribution of TNFR1 in nociceptors for pain in autoimmune disease

Presenter: Rory H. Karbonik[1]
Additional author(s): Dr. Shawn Lamothe[3], Andrea G. Klassen[2], Gustavo Tenorio[1], Dr. Jason R. Plemel[2], Dr. Harley Kurata[3], Dr. John R. Bethea[4], Dr. Bradley J. Kerr[1 2 3]
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[4]Department of Anatomy and Cell Biology, Washington University

Introduction:
Inflammatory mediators such as TNFα can significantly impact neural plasticity and pain hypersensitivity in a sex-specific manner. Whether TNF signalling leads to sex specific changes in autoimmune disease is not yet fully understood. This study examined the impact of deleting the TNF receptor, TNFR1, in nociceptors on pain and neural plasticity responses in a mouse model of autoimmune disease in male and female mice.

Design and Methods:
Baseline mechanical, thermal and motor behaviours were assessed prior to experimental autoimmune encephalomyelitis (EAE) to confirm that TNFR1 loss did not alter normal sensory or motor function. Following EAE induction, these same behavioural assays were used to evaluate sex dependent changes in pain sensitivity in autoimmune related pain.

Intervention(s) and Outcome Measures:
A mouse *Nav1.8Cre;TNFR1 fl/fl* line was generated to selectively delete TNFR1 from nociceptors (Nav1.8-TNFR1-/-). Outcome measures were determined by the observed changes behavioural assays.

Results:
We observed no baseline cold and mechanical sensitivity differences between control and Nav1.8-TNFR1-/- mice. In the EAE model, mice develop cold and mechanical hypersensitivity at the onset of clinical disease. Male Nav1.8-TNFR1-/- mice with EAE were however, protected from developing cold allodynia. In contrast, cold allodynia was exacerbated in female Nav1.8-TNFR1-/- mice compared to wild type controls. Neurite outgrowth is now being analysed to understand differences in male and female Male Nav1.8-TNFR1-/- mice's branching complexity with EAE.

Conclusions:
Our findings reveal a clear sex-specific role for TNFR1 in autoimmune pain. TNFR1 deletion decreases hypersensitivity in males but exacerbates pain in females. These results highlight the importance of considering sex as a biological variable in the treatment of autoimmune pain.

Learning Objectives:
At the end of this presentation participants will be able to describe the role of TNFR1 in autoimmune pain and plasticity.

What's New in Preventing Postpartum Hemorrhage? A Narrative Review

Presenter: Dr. Adanna Odunze[1,2]
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[2]Department of Family Medicine, Faculty of Medicine & Dentistry, University of Alberta

Introduction:
Postpartum hemorrhage (PPH) is a leading cause of worldwide maternal morbidity and mortality. Anesthetic management plays a pivotal role in the prevention, early recognition, and treatment of PPH during cesarean delivery (CS). This narrative review aims to synthesize current evidence and expert recommendations regarding strategies to reduce the risk of hemorrhage following CS.

Design and Methods:
A comprehensive literature search was conducted in the electronic databases PubMed, MEDLINE, Embase, and the Cochrane Library to identify relevant studies published between January 2020 and March 2026. This was conducted as a narrative review, thus did not follow a formal systematic protocol.

Intervention(s) and Outcome Measures:
Full-text articles were reviewed, selecting abstracts relevant to prevention strategies for PPH. Emphasis was placed on perioperative anesthetic practices and pharmacologic prophylaxis. Data from selected studies were then synthesized and organized into thematic categories, including pharmacologic advances, system improvements, and clinical behaviour shifts.

Results:
This narrative review identified a growing body of evidence supporting a proactive approach to the management of PPH during CS. Key advances include: prophylactic tranexamic acid and optimized uterotonic strategies, improved risk stratification and preoperative planning, and a clinical behaviour shift toward quantitative blood loss monitoring with early escalation of interventions.

Conclusions:
Collectively, recent evidence supports a paradigm shift in PPH management from reactive treatment to anticipatory, protocolized care. Integration of pharmacologic prophylaxis, systems preparation, and quantitative monitoring with early treatment escalation offers a coherent framework to reduce PPH-related morbidity. Future efforts should focus on implementation, standardization, and evaluation of strategies across diverse clinical settings and patient populations to help translate evidence into sustained improvements in maternal outcomes.

Learning Objectives:
At the end of this presentation participants will be able to integrate emerging strategies for PPH prevention at CS, with emphasis on pharmacologic prophylaxis, preoperative risk stratification and planning, and early recognition and escalation.

Waiting to be PICC'd: Impact of Scheduled PICC Insertion Days on Fasting Times for Pediatric Inpatients: A Quality Audit

Presenter: Dr. Caroline Peplinski[1]
Additional author(s): Dr. Paula Holinski[1], Dr. Rebecca Entz[1], Jing Huang[2]
[1]Department of Anesthesiology & Pain Medicine, Faculty of Medicine & Dentistry, University of Alberta
[2]Faculty of Medicine and Dentistry, University of Alberta

Introduction:
Prolonged pre-procedural fasting in pediatric inpatients is common and may lead to dehydration, irritability and hypoglycemia. Peripherally inserted central catheter (PICC) placement frequently requires sedation, necessitating adherence to peri-anesthetic fasting guidelines. At our institution, PICC insertions were previously performed on non-standardized days, potentially contributing to inconsistent and excessive fasting durations. This quality audit aimed to (1) describe baseline fasting practices for pediatric inpatients undergoing PICC insertion, (2) evaluate the impact of implementing scheduled PICC insertion days on fasting duration, and (3) identify system-level opportunities to reduce unnecessary fasting.

Design and Methods:
We conducted a retrospective quality audit at a tertiary pediatric hospital comparing two cohorts: pre-intervention (unscheduled PICC days) and post-intervention (designated PICC insertion days). Pediatric inpatients undergoing PICC placement under sedation were included. Data collected included age, time of last solid intake, time of last clear fluid intake, procedure start time, and total fasting duration. Fasting times were compared with institutional guideline recommendations. Continuous variables were summarized using means or medians, and group comparisons were performed using analysis of variance (ANOVA).

Intervention(s) and Outcome Measures:
The intervention standardized PICC insertions to designated procedural days with advanced scheduling and improved communication to inpatient teams. The primary outcome was total fasting duration for solids and clear fluids. Secondary outcomes included the proportion of patients exceeding recommended fasting intervals and variability in fasting duration.

Results:
Preliminary review demonstrates variability in fasting duration, with many patients fasting well beyond recommended guidelines, representing a clinically meaningful quality concern. Comparative statistical analysis is underway to evaluate differences between cohorts.

Conclusions:
Scheduled PICC insertion days represent a feasible system-level strategy to reduce unnecessary pre-procedural fasting. Standardization and improved communication may enhance alignment with peri-anesthetic guidelines and improve patient-centred perioperative care. Future initiatives may include unit-specific fasting guidance for anticipated PICC procedures.

Learning Objectives:
At the end of this presentation participants will be able to:
1. Describe baseline fasting practices for pediatric inpatients awaiting PICC insertion.
2. Assess the effect of PICC schedule standardization on fasting times.
3. Discuss opportunities for system-level interventions to reduce unnecessary fasting for pediatric inpatients.

Perioperative Management of Acquired Angioedema Secondary to Marginal Zone Lymphoma: A Case Report

Presenter: Noemi Simpson[1]
Additional author(s): n/a
[1]Department of Anesthesiology & Pain Medicine, Faculty of Medicine & Dentistry, University of Alberta

Introduction:
Acquired angioedema due to C1 esterase inhibitor deficiency is a rare, potentially life-threatening condition associated with lymphoproliferative disorders. Airway compromise is a major perioperative concern. This case highlights anesthetic strategies including coagulation assessment and neuraxial decision-making.

Design and Methods:
Case report of a 53-year-old female with acquired angioedema secondary to marginal zone lymphoma undergoing elective knee surgery.

Intervention(s) and Outcome Measures:
Preoperative C1 esterase inhibitor (1500 units IV) was administered. Platelet count was 119 ×109/L, INR 1.3, fibrinogen 3.3 g/L. Neuraxial anesthesia was selected based on acceptable coagulation parameters. Rescue therapies (C1inhibitor, icatibant) were available.

Results:
Spinal anesthesia with sedation was successfully performed without airway instrumentation. No angioedema or bleeding complications occurred.
Postoperative course was stable.

Conclusions:
Careful coagulation assessment and multidisciplinary planning enabled safe neuraxial anesthesia. Avoidance of airway manipulation and prophylactic C1 inhibitor reduced perioperative risk.

Learning Objectives:
At the end of this presentation participants will be able to:
1. Evaluate coagulation parameters for neuraxial anesthesia suitability.
2. Apply strategies to minimize airway manipulation in angioedema.
3. Incorporate prophylactic and rescue therapies into perioperative planning.

My Anesthesia Choice-Hip Fracture:
Implementation and evaluation of a strategy to improve pre-anesthesia care discussion

Presenter: Carla Sosa[1]
Additional Author(s): Arthur Tung[1], Dania Villarreal[1] and Dr. Derek Dillane[1]
[1]Department of Anesthesiology & Pain Medicine, Faculty of Medicine & Dentistry, University of Alberta

Introduction:
Hip fracture surgery is a common procedure among older adults. Patients undergoing surgery wish to be involved in decision about anesthesia care. However, anesthesia teams may fail to explain risks and benefits of available anesthesia options, elicit patient preferences and integrate such preferences into care choices. This study will evaluate the implementation of an established strategy that has been shown to improve patient clinical communication and increase shared decision making.

Design and Methods:
This randomized, multisite clinical trial will recruit 510 participants aged 50 or older scheduled to undergo for a hip fracture surgery and eligible for spinal or general anesthesia. This study will take place over three phases. Pre-implementation phase, patients will be interviewed after surgery to evaluate their knowledge of anesthesia options and satisfaction with anesthesia team. Implementation phase where the conversation aid will be introduced during the preoperative consultation by the anesthesiologist. Maintenance phase will evaluate how likely the intervention will be to become part of sustained usual care. Data will be analyzed using mixed-effects models.

Intervention(s) and Outcome Measures:
Anesthesiologist will receive brief training to include conversation aid tool that compares the risk and benefits of spinal vs general anesthesia. Our primary outcome is to assess aid tool conversation intervention effectiveness on patient satisfaction, decisional uncertainty and patient-reported measures of shared decision making.

Results:
85 participants were recruited during pre-implantation phase. Patient recruitment for the implementation phase is in progress (30/200 participants).

Conclusions:
The incorporation of aid-tool for pre-anesthesia conversation will expect to improve communication between patient and clinicians, and increases shared decision making.

Learning Objectives:
At the end of this presentation, participants will be able to:
1. Recognize the critical need to engage patients into anesthesia care discussion and elicit patient preferences.
2. Identify the value of patient-centeredness and value of care delivered to older patients with hip fracture.

The IMAGINE Survey: Child and family preferences for distraction modalities to reduce procedural pain and distress

Presenter: Dr. Serena Tejpar[1]
Additional author(s): Elise Kammerer[2], Evelyne D. Trottier[3], Naveen Poonai[4], Patricia Candelaria[2], Rebecca Liedtke[2], Samina Ali[2,5]
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[5]Women and Children's Health Research Institute, Faculty of Medicine & Dentistry, University of Alberta

Introduction:
Pain is a complex biopsychosocial experience and family preference for non-pharmacologic adjuncts are integral to optimizing procedural analgesia and improving patient experience. Intravenous insertion (IVI) is one of the most frequently performed pediatric procedures and is often associated with significant pain and distress. Distraction is an effective way to lessen these adverse experiences. Our objectives were to determine which distraction tools children and their caregivers prefer.

Design & Methods:
We conducted a multicenter, cross-sectional survey of children aged 2-17 years and their caregivers in three Canadian pediatric emergency departments from July to December 2022. A novel survey was completed by both caregivers and their children. Survey domains included demographics, prior IVI or bloodwork exposure, anticipated procedural distress, and preferences for distraction tools. Presented distraction modalities included digital (i.e. tablet, smartphone, virtual reality) and non-digital (i.e. stress balls, bubbles, fidget spinners) options.

Intervention(s) and Outcome Measures:
Primary outcomes were caregiver and child preferences for distraction tools during IVI and the outcomes identified as most representative of their procedural experience.

Results:
A total of 742 caregiver-child pairs were enrolled; 78.7% were mothers and 51.1% of children were male, while 52.7% of children had previous IVI/bloodwork experience. Mean caregiver age was 38.6 years (SD 7.6), and mean child age was 7.4 years (SD 4.8). Overall, the top three child and caregiver distraction choices (digital or non-digital) for IVI were the same: tablets (34.5% caregivers, 27.4% children), virtual reality goggles (16.2% caregivers, 15.8% children), and smartphones (16.2% caregivers, 17.1% children). Children's top three non-digital distraction choices were stress balls (23.7%), music (22.1%), and poppers (15.7%).

Conclusion:
This multicenter survey demonstrates that children and caregivers prefer digital distraction modalities during IVI. Integrating patient and family preferences into procedural pain management may enhance the care experience and guide evidence-based selection of distraction tools in healthcare settings.

Learning Objectives:

By the end of this session, participants will be able to:

1. Recognize the short and long-term consequences of untreated procedural pain in children.
2. Identify the top child and caregiver preferences for distraction modalities to reduce procedural pain and distress.
3. Apply these findings in clinical practice to inform the selection of distraction modalities in clinical practice.

Characterization of the Effect of Chronic Opioid Use on Immune Cell Mediated Endogenous Opioid Production: A Pilot Study

Presenter: Dania Villarreal Andrade[1]
Additional Author(s): Dr. Colleen Harnett[1], Dr. Akua Gyambibi[1], Russel Harrison[1], Fadi Hammal[1], Dr. Kevan Smith[1], Dr. Bradley Kerr[1], Dr. Derek Dillane[1]
[1]Department of Anesthesiology & Pain Medicine, Faculty of Medicine & Dentistry, University of Alberta

Introduction:
Immune-mediated endogenous opioid production is known to play a role in post-injury analgesia, but there is limited evidence on the impact of long-term opioid use on immune-mediated endogenous opioid production. Prolonged exposure to exogenous opioids can significantly impact immune surveillance, leading to a decreased response to injury and infection. We sought to measure the levels of endogenous opioid transcripts for the opioid precursors proopiomelanocortin (POMC), proenkephalin (PENK) and prodynorphin (PDYN) in the immune cell populations of opioid naïve and opioid experienced surgery patients. We hypothesized that chronic exposure to opioids alters the immune-mediated opioid response to surgical tissue injury resulting in reduced levels of endogenous opioids being produced by macrophages and T-cells.

Design and Methods:
Adults (≥ 18 years) presenting for elective surgery were recruited in this prospective cohort study. Blood samples (5mL) were obtained preoperatively or immediately after induction of general anesthesia from male opioid naive (n=11) and male opioid experienced patients (n=11). Chronic opioid use was defined as opioid use for 90 or more consecutive days or 120 or more cumulative days over 12 months. qPCR was performed to measure the levels of endogenous opioid transcripts (PENK, POMC, PDYN) in the isolated PBMCs and the mean fold change was analyzed using the ΔΔCt method with housekeeper gene glyceraldehyde-3-phosphate dehydrogenase (GAPDH). Statistical analysis was performed using two-tailed independent t-tests on GraphPad Prism v8.4.2.

Results:
qPCR results show a mean fold change of 1.11 ($p=0.61$) for POMC, 0.89 ($p=0.71$) for PENK and 1.04 for PDYN ($p=0.95$), in experienced opioid participants compared to naive participants. Overall, there was no significant difference in endogenous opioid expression between naive and opioid experience users.

Conclusions:
Although there are small increases or decreases in expression of POMC, PENK, and PDYN, none of these differences are statistically significant. Therefore, the study does not provide sufficient evidence to show that chronic opioid use alters the expression of these genes in the sampled tissue. Future studies could benefit from a larger sampling size and new methods like RNA sequencing to identify new targets.

Learning Objectives:
At the end of this presentation, participants will be able to identify the role of immune cell-derived opioid precursors in response to chronic opioid exposure.

Assessment of Neurosurgical Criteria for American Trauma Accreditation at Stollery Children Hospital

Presenter: Dr. Annemarie Walters-Shumka[1]
Additional author(s): Kym Boyko[2], Dr. Adrienne Thompson[2], Dr. Ruth Bird[1,2]
[1]Department of Anesthesiology & Pain Medicine, Faculty of Medicine & Dentistry, University of Alberta
[2]Stollery Children's Hospital, Edmonton, Alberta

Introduction:
This study aims to assess the quality of neurotrauma response at the Stollery Children's Hospital to ensure adherence to the American College of Surgeons (ACS) trauma accreditation standards for neurotrauma care.

Design and Methods:
A retrospective observational study was conducted by reviewing medical charts for children aged 0–17 years who had been identified as major pediatric traumas (defined as an Injury Severity Score >12), over a 1.5-year period (January 2022–June 2023). Findings from this review were compared against ACS accreditation standards.

Intervention(s) and Outcome Measures:
There was no intervention as this was a retrospective observational study. The primary outcomes measure was adherence to ACS standards, including neurosurgeon involvement in trauma activations, appropriate staff training, and timeliness of neurosurgical evaluation. Secondary outcome measures were neurotrauma patient demographics and severity of neurologic injury.

Results:
A total of 141 pediatric major trauma patients were identified. Neurologic trauma accounted for just over one half of the total trauma presentations. All 72 patients were seen by the neurosurgical service with an attending staff neurosurgeon involved in clinical decision making. Only 24 patients (33.33%) were documented to have been seen within 30 minutes of CT. With respect to severity of injury, 33 had an initial GCS <9 (45.83%), 11 had a GCS 9-11 (15.28%), 66 patients had intercranial trauma on CT, and 6 had documented spinal cord deficit. Based on CT findings, 18 patients were classified as severe TBI. The mortality rate of neurologic trauma was 11.11%.

Conclusions:
Pediatric neurotrauma presentations carry significant morbidity and mortality. The current neurosurgical trauma response at the Stollery Children's Hospital is compliant with most domains of the ACS standards including neurosurgeon attending involvement and appropriate pediatric fellowship training. Timeliness of evaluation falls short of accreditation guidelines; however, this is difficult to assess given inconsistencies with retrospective charting.

Learning Objectives:
At the end of this session, participants will be able to:
1. Appraise the American Trauma Accreditation Guidelines, specifically as they relate to pediatric neurosurgery.
2. Evaluate pediatric neurologic trauma cases collected from Stollery Children's Hospital.
3. Compare the current trauma response against accreditation criteria to identify gaps, strengths, and areas for improvement.

Dexmedetomidine for treatment of Postop Hyperactive Delirium

Presenter: Dr. Evan Whitfield[1]
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Introduction:
Postop Delirium is a common complication encountered by Anesthetists. Patients' advancing age and comorbidities mean this problem is likely to increase in incidence. Outcomes among delirious patients are worse than those without delirium. Non-pharmacological measures are difficult to enact in a PACU environment. Medication management is generally limited to benzodiazepines and antipsychotics. Once these tools are used, further options for treatment of hyperactive delirium are limited. Dexmedetomidine represents a novel treatment for post op hyperactive delirium. It is well established as a sedative, anxiolytic, and analgesic; however, dexmedetomidine may represent an additional tool for the anesthetist encountering hyperactive delirium. This study aims to review emerging evidence proposing dexmedetomidine as a treatment for hyperactive delirium.

Design and Methods:
A review of current literature testing dexmedetomidine for treatment of hyperactive delirium was conducted among anesthesia and critical care practise guidelines, university databases, and scientific publications. 3 publications were selected based on applicability to Anesthesia and the PACU environment were analyzed using the GRADE framework.

Intervention(s) and Outcome Measures:
Interventions included infusion of dexmedetomidine in comparison to placebo, haloperidol, and midazolam. Outcome measures include duration of delirium and severity of agitation.

Results:
Interventions included infusion of dexmedetomidine in comparison to placebo, haloperidol, and midazolam. Outcome measures include duration of delirium and severity of agitation.

Conclusions:
Dexmedetomidine represents a potential treatment for hyperactive delirium rather than a purely prophylactic measure. In multiple contexts, hyperactive delirium can be treated with infusions of dexmedetomidine.

Learning Objectives:
At the conclusion of this session, participants will be able to:
1. Describe the mechanism of action of dexmedetomidine
2. Describe the pathophysiology of delirium
3. Familiarize themselves with sedation scales and the dexmedetomidine infusions required for sedation.

Evaluation of intraoperative fresh frozen plasma use in infants 4-8 kg undergoing congenital heart surgery and perioperative bleeding and transfusion

Presenter: Dr. Jolene Wong[1]
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Introduction:
Fresh frozen plasma (FFP) is routinely administered during cardiopulmonary bypass (CPB) in young children to mitigate dilutional coagulopathy. However, evidence supporting this practice is limited, and studies show mixed results on whether FFP reduces postoperative bleeding or transfusion needs (1,2). Recent guidelines also emphasize the lack of evidence in infants and young children; therefore, the clinical benefit of FFP in this group remains unclear (3). This study aims to evaluate whether administering FFP during CPB in children weighing 4–8 kg affects postoperative transfusion requirements and bleeding.

Design and Methods:
This retrospective chart review included children 4–8 kg who underwent congenital cardiac surgery with CPB at the Stollery Children's Hospital from 2019 to 2023. Categorical variables were compared using Fisher's Exact test, and continuous variables were compared using Pearson's t-test or Mann–Whitney's U test where appropriate.

Intervention(s) and Outcome Measures:
Primary outcomes were 24-hour postoperative transfusion of packed red blood cells (pRBC), plasma, platelets, or any blood product. The secondary outcome was postoperative bleeding measured as 24-hour drain output normalized to weight.

Results:
Out of 552 charts screened, 422 patients were included for analysis and stratified into no FFP-use (n=99) and FFP-use (n=323) on CPB pump. *Primary Outcomes:* Patients who received FFP intraoperatively were statistically more likely to require pRBC transfusions (18.2%, 35.0%; $p = 0.002$) or any blood product within 24-hours postoperatively (21.2%, 39.6%; $p<0.001$). Postoperative platelet transfusion rates (10.1%, 13.3%, $p = 1.00$) and FFP transfusion rates (5.1%, 5.6%; $p = 0.49$) did not differ significantly between both groups. *Secondary Outcomes:* Patients who received FFP had a significantly higher drain output 24-hours postoperatively than those who did not receive FFP (15.3 ± 10.1 mL, 21.7 ± 30.2 mL, $p = 0.001$).

Conclusions:
Intraoperative FFP administration during CPB was associated with higher pRBC transfusion rates, without reducing plasma or platelet transfusions. Intraoperative FFP was also associated with increased postoperative bleeding, reflected by higher 24-hour drain output. Routine FFP use in the CPB prime for infants 4–8 kg undergoing congenital cardiac surgery may not improve postoperative bleeding and transfusion rates as intended.

Learning Objectives:
At the conclusion of this session, participants will be able to:
1. Recognize the lack of current data supporting the use of fresh frozen plasma in the cardiopulmonary bypass prime for infants.
2. Realize that routine fresh frozen plasma use in the cardiopulmonary bypass prime for infants may not improve postoperative transfusion rates or bleeding as intended.

Pediatric Recreational Motorized Vehicle Trauma in Alberta: Injury Patterns and Resource Utilization

Presenter: Dr. Jessica Zapata[1]
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Introduction:
Recreational motorized vehicles (RMVs), including all-terrain vehicles, dirt bikes, snowmobiles, and e-scooters, are an important cause of severe pediatric trauma. Alberta-specific data describing injury patterns and healthcare resource utilization remain limited. This study aimed to describe the clinical characteristics, injury severity, and hospital resource use associated with pediatric RMV-related trauma presenting to a tertiary pediatric trauma centre.

Design and Methods:
We conducted a retrospective review of trauma registry data from the Stollery Children's Hospital (December 2019 - June 2023). Pediatric patients (<18 years) presenting with major trauma (Injury Severity Score [ISS] >12) were identified. Descriptive statistics summarized the cohort. Continuous variables were reported as means with standard deviations or medians with interquartile ranges, and categorical variables as counts and percentages. Descriptive comparisons between RMV-related and other blunt trauma were performed.

Intervention(s) and Outcome Measures:
No interventions were performed. Primary outcomes included injury patterns and injury severity. Secondary outcomes included operative intervention, pediatric intensive care unit (PICU) admission, hospital length of stay, and mortality.

Results:
Of 345 pediatric patients with major trauma, 55 (16%) sustained RMV-related injuries, accounting for 17% of blunt trauma. ATVs were most common (58%), followed by dirt bikes (23.6%), snowmobiles (14.5%), and e-scooters (3.6%). Patients were predominantly male (72.7%) with a mean age of 13.1 years. Mean ISS was 21.0. Surgical intervention was required in 58.2%, and 30.9% required PICU admission. Median hospital length of stay was 6 days [IQR 3-9], with median PICU stay of 5 days [IQR 2-12]. Helmet use was documented in 40%. Mortality was 5.5%.

Conclusion:
Pediatric RMV-related trauma is associated with significant injury severity and substantial healthcare resource utilization. These findings provide a descriptive overview of injury patterns and may inform future research and injury prevention efforts.

Learning Objectives:
At the conclusion of this session, participants will be able to:
1. Describe injury patterns and clinical characteristics of pediatric RMV-related trauma.
2. Summarize injury severity and healthcare resource utilization.
3. Discuss how descriptive injury data may inform future research and prevention efforts.

Airway management in post-tonsillectomy bleeding

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Introduction:
Concern for bleeding to obscure laryngoscope cameras has traditionally limited video laryngoscopy (VL) uptake for post-tonsillectomy hemorrhage, which may otherwise be preferred for potentially difficult airways. This study compares first attempt failure rates associated with direct laryngoscopy (DL) and VL in post-tonsillectomy hemorrhage cases.

Design and Methods:
Electronic medical records of 796 patients were reviewed, which identified 57 adult post-tonsillectomy hemorrhage cases in Edmonton since 2020. Data from 297 post-tonsillectomy bleeding cases (all ages) in Alberta were obtained via the Slicer Dicer function on Connect Care. Inclusion criteria were recent tonsillectomy and hemorrhage requiring intubation and surgery. Exclusion criteria included airway capture not utilizing either DL or VL and intubation by a non-anesthesia provider.

Intervention(s) and Outcome Measures:
The primary outcome was frequency of failed first intubation attempts according to laryngoscopy technique. Secondary outcomes included methods of successful subsequent attempts and complications including aspiration, desaturation, and peri-operative mortality. Outcomes were compared using a Chi Square test.

Results:
Within the Edmonton zone, VL uptake for post-tonsillectomy cases was 28.1% and was not statistically different from provincial data for post-tonsillectomy hemorrhage cases (24.6%, p=0.774) or all surgical cases (29.7%, p=0.5229). There was no significant difference in failed first intubation attempts by technique (0/40 DL vs 1/17 VL, p=0.298). Correspondingly, there were no differences in associated complication rates. The one documented failed first intubation attempt resulted from blood obscuring the VL camera, with a second successful attempt using DL by the same provider.

Conclusions:
VL may provide utility for post-tonsillectomy hemorrhage cases in the setting of appropriate provider experience and careful clinical assessment. One instance of blood obscuring the VL camera resulted in a failed intubation attempt by an anesthesia provider. Caution should be utilized in all patients with post-tonsillectomy bleed and skill with DL remains crucial as an airway management technique.

Learning Objectives:
At the end of this presentation, participants will be able to:
1. Describe the frequency of DL and VL in post-tonsillectomy bleeding cases.
2. Compare the utility of VL in post-tonsillectomy bleeds with the relative risk of failed first intubation attempts.