

Division of General Surgery

39th Annual Resident Research Day



Friday, April 10th, 2026

The Fairmont Hotel Macdonald
Wedgwood Room



UNIVERSITY OF ALBERTA
FACULTY OF MEDICINE & DENTISTRY
Department of Surgery

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Muriel Brackstone, MD, PhD, FRCSC

Chair/Chief, Division of General Surgery
General Surgeon & Surgical Oncologist
Professor of Surgery & Oncology, Western University



Dr. Muriel Brackstone is a Surgical Oncologist at London Health Sciences Center, Professor of Surgery and Oncology at Western University and city-wide Chair/Head of General Surgery. She completed her residency in General Surgery at Western University in 2004, followed by a fellowship in breast surgical oncology at the University of Toronto. During her early years in practice, she completed an MSc in Clinical Epidemiology & Biostatistics followed by a PhD in Pathology/Clinical Trials at Western. She also completed Harvard University's Surgical Leadership Program. She is the founding medical director of London's Breast Care Program and created one of the first Canadian fellowships in Oncoplastic Surgery. She created the London Tumour Biobank as a repository platform for window of opportunity clinical trials in Oncology and has completed numerous clinical trials with over 150 peer reviewed publications. She is the provincial breast lead for Cancer Care Ontario and is lead author on a number of guideline publications including the management of locally advanced breast cancer and the joint ASCO/OH guideline on the management of the axilla.

Klaus Buttenschoen, Prof. Dr. med., MD

Associate Professor, Surgery
Division of General Surgery
University of Alberta



Dr. Klaus Buttenschoen is an acute care and general surgeon practicing at the University of Alberta Hospital. He attended medical school at the Goethe-University Frankfurt am Main, and residency at both Northwest Hospital in Frankfurt a. M. and the University of Ulm, Germany. He trained as a fellow in Hepatobiliary and Visceral Surgery at the University of Ulm, became a professor of surgery and held an academic position within the faculty of the University of Ulm. In 2008, he joined the Department of Surgery at the University of Alberta in Edmonton. His clinical practice focuses on acute care surgery and general surgery and his research interests on echinococcosis, sepsis and endotoxin translocation.

Hayley Forbes, MD, FRCSC

General Surgeon Grey Nuns Hospital
Minimally Invasive Foregut and Bariatric Surgeon
Clinical Lecturer University of Alberta



Dr. Hayley Forbes is a general surgery that is practicing at the Grey Nuns Community Hospital. She has a bachelor's degree in multidisciplinary Health Sciences from the University of Ottawa. She attended medical school at Memorial University of Newfoundland and pursued her general surgery residency here at the University of Alberta. She then went to train as a surgical fellow at the University of Manitoba completing a minimally invasive and bariatric surgery fellowship as well as a received requirements for the metabolic and bariatric certification from the American society for Metabolic and Bariatric surgery. Her clinical practice is focused on foregut pathology while maintaining a community and acute care surgery practice. Her research background and interests have focused mainly on quality improvement and local chart review to affect changes in practice.

Prizes

1 st Prize	\$500
2 nd Prize	\$400
3 rd Prize	\$300
4 th Prize	\$200
5 th Prize	\$100

Scoring Criteria

Content	8
Organization	4
Originality	4
Presentation	4
Total	20

2025 General Surgery Resident Research Day Winners

Congratulations to last year's winners:

			<u>Preceptor(s)</u>
1 st	Zofia Czarnecka	Glycemic Control and Risk of Recurrent Hypoglycemia after Total Pancreatectomy	Dr. James Shapiro
2 nd	Paul Lerner	Transcriptomics with <i>In Silico</i> Cell Mapping Highlights Transcription Factor AP-2 (<i>TFAC2A/C</i>) Aberrations in Pediatric Crohn's Bowel	Drs. Troy Perry & Eytan Wine
3 rd	Ryerson Seguin	Level 2 Oncoplastic Breast Surgery Improves Quality of Life after Breast Cancer Surgery: A Prospective Quality of Life Study	Dr. Lashan Peiris
4 th	Alexander Miles	The Alpine Model of Surgical Risk Management: How Mountain Guides Can Inform the Way Surgeons Assess and Mitigate Risk	Dr. Simon Turner
5 th	Susan Muncner	Experiences and Results of a Canadian Colorectal Robotic Surgery Program: An Observational Cohort Study of the First Five Years	Drs. Haili Wang, Mark Dykstra, & Ryan Snelgrove

Research Day Schedule

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1430 Adjournment and Closing Statement – Dr. David Bigam



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ABSTRACT SESSIONS 1 & 2

Evaluation of an Automated, Cost Efficient, Prospective Database for Total Pancreatectomy Using Artificial Intelligence: A Pilot Study

Presented by: Kevin Verhoeff, PGY-5
Preceptor: Dr. A.M. James Shapiro

Background:

The University of Alberta is Canada's highest-volume center for total pancreatectomy with islet autotransplantation (TPIAT). Despite leadership in this field, most practice guiding studies and quality improvement initiatives rely on retrospectively assembled datasets, which are time-intensive and limit the feasibility of continuous, prospective outcome evaluation.

Objectives:

This aim of this pilot study was to evaluate the feasibility of a secure, cost efficient, automated prospective database for TPIAT using artificial intelligence to optimize future quality improvement and program evaluation.

Methods:

Standardized history and physical consult templates were developed for patients undergoing evaluation for TPIAT. A locally-hosted, closed-loop, rules-based automated data extraction tool was designed to operate on a secure institutional computer to extract predefined clinical variables and prospectively populate a quality improvement database. The system was designed to perform deterministic data extraction without automated decision-making, predictive analytics, clinical decision support, or adaptive learning.

To evaluate this tool, 500 representative consults with variable clinical presentations were generated and processed by the extraction tool. Extraction accuracy was evaluated overall and across 48 predefined variables.

Results:

Across 500 exemplary TPIAT consults, the automated extraction tool captured data across 48 clinical domains including basic demographics (age, weight, height), past medical history, past surgical history, social history, complaint, past medical history, and preoperative bloodwork. Overall extraction accuracy was 99.85%. Basic demographics and preoperative bloodwork had a 100% accuracy rate, while past medical history (99.4%) and past surgical history (99.1%) data collection was less accurate but remained highly reliable.

Conclusions:

This pilot study demonstrates the potential of automated, secure, artificial intelligence programs to accurately collect quality improvement data for patients undergoing TPIAT. This approach offers a scalable alternative to retrospective data abstraction and has the potential to fundamentally improve the efficiency and quality of clinical research at our institution. Importantly, this model represents a framework that can be adopted by other programs to enable sustainable prospective data collection.

Association of Perfusate Cytokines and Chemokines during Liver Normothermic Machine Perfusion with Early Allograft Dysfunction

Presented by: Joshua Hefler, PGY-5
Preceptor: Dr. James Shapiro

Background:

Liver normothermic machine perfusion (NMP) is a novel modality for liver preservation prior to transplantation. It has shown benefit in reducing ischemia-reperfusion injury (IRI), as well as safely extending the duration of preservation prior to transplantation. Increasingly, it is being used as a way to assess the viability of organs. Livers that are of marginal quality, such as those donated after circulatory death, subjected to prolonged ischemia times or from obese or elderly donors, can be evaluated via NMP to assess their suitability prior to transplantation. Perfusion parameters, as well as liver transaminases, lactate clearance, and bile production, have been used to judge an organs viability. Research into novel biomarkers, which may better predict organ function upon transplantation, is still in its infancy. As mediators of the inflammatory process, any number of cytokines and/or chemokines released during perfusion may serve as potential candidates.

Hypothesis:

Cytokines and chemokines released during liver NMP have the potential to serve as biomarkers for liver injury.

Methods:

Eighteen livers underwent NMP prior to transplantation using the OrganOx metra® platform at the University of Alberta Hospital from December 2021 to May 2022 as part of an open-label clinical trial of the device. Blood-based perfusate was collected from these organs at the start, middle and end of perfusion. Bile was also collected at the end of perfusion, if produced by the organ. Perfusate samples were centrifuged and supernatant was collected for analysis. Samples underwent a multiplex cytokine and chemokine assay (Human Cytokine/Chemokine 71-Plex Discovery Assay® Array, Eve Technologies) and results were analyzed comparing perfusate levels to clinically relevant outcomes, such as early allograft dysfunction (EAD).

Results:

Eight of the eighteen recipients receiving livers following NMP experienced EAD (as defined by peak AST >2000U/L or bilirubin $\geq 171\mu\text{mol}$ or INR ≥ 1.6 on post-operative day 7). Pro-inflammatory cytokines, interleukin (IL)-8 (2600.16 vs. 1368.39pg/mL; $p=0.033$), IL-15 (41.01 vs. 26.86pg/mL; $p=0.025$), IL-16 (1572.44 vs. 736.56pg/mL; $p=0.019$), IL-33 (85.27 vs. 44.28pg/mL; $p=0.018$) and sCD-40L (186.71 vs. 87.36pg/mL; $p=0.035$) were all significantly elevated by the end of perfusion in livers whose recipients experienced EAD compared to those who did not.

Conclusions:

In an exploratory analysis of cytokines and chemokines released during liver NMP, several proinflammatory markers were identified to be associated with EAD. Further prospective studies, including a larger number of organs, are necessary to validate these findings and assist in determining their clinical utility.

Pre-hospital Pulse Pressure is an Early Warning Sign of Hemorrhage in Trauma

Presented by: Nate Nadolski, PGY-2
Preceptor: Dr. Sandy Widder

Background:

Trauma is a significant cause of death in Canada and a review of national data found that 15% of traumatic deaths were due to hemorrhage. While there have been advances in transfusion medicine and early hemorrhage control protocols over recent years, 16% of traumatic deaths due to hemorrhage are still deemed preventable. Early detection of hemorrhage, especially from an internal source, is a critical survival factor that healthcare providers strive to improve on.

Initial vital signs collected and relayed by Emergency Medical Services (EMS) are part of a limited amount of information receiving clinicians are provided. Therefore, they serve as a crude, but important, glimpse into the patient's clinical status. Due to the high variability of pre-hospital heart rates and the relatively delayed changes to blood pressure, both vital signs have limited utility for early detection of hemorrhage. However, using data from Southern California, Priestley *et al.* (2019) found that a narrowed pulse pressure - the difference between systolic and diastolic blood pressures - is an independent predictor of significant traumatic bleeding.

This study uses local data to explore the utility of pulse pressure for early detection of traumatic hemorrhage. Our aim is to bolster the current clinical decision-making toolkit to help triage and expedite critical interventions for actively bleeding patients.

Hypothesis:

We hypothesize that a narrowed pulse pressure will be associated with active hemorrhage in trauma patients.

Methods:

This retrospective cohort study uses data collected from Alberta EMS databases from 2017 to 2020. The study includes all trauma patients arriving at the three major trauma centres in Alberta (RAH, UAH, & FMC).

Results:

Of the 2177 patients included in our study, 68 (3.1%) were found to have active hemorrhage (AH) at the time of hospital arrival. The mean pre-hospital pulse pressure was significantly narrower in the AH group compared with the non-AH group (40 ± 12 mmHg vs 53 ± 11 , $p < 0.001$). Multivariate analysis revealed that, unlike heart rate and blood pressure, a narrowed pre-hospital pulse pressure is an independent predictor of AH (odds ratio 0.98). Overall, these data support the use of pulse pressure as a tool for early detection of traumatic hemorrhage. This study opens the potential for pulse pressure to accelerate patient care and reduce the number of preventable traumatic deaths in Alberta.

Liver Transplantation in Low- and Lower-Middle Income Countries: A Scoping Review

Presented by: Susan Muncner, PGY-4
Preceptor: Dr. Abdullah Saleh

Background:

Globally, the burden of liver disease is increasing, and prevalence is highest in low and lower-middle income countries (LMICs). Liver transplantation (LT) is the definitive treatment for acute liver failure, chronic end-stage liver disease, metabolic liver disease, and malignancy. However, LT is a highly-resource intensive procedure with limited availability worldwide. Thus, the disparity between demand for and access to LT in LMICs widens every year. The aim of this scoping review was to synthesise existing literature on current practice of LT in low resource settings with the goal of guiding future programme development in underserved areas.

Hypothesis:

In LMICs, LT programmes are feasible and can achieve acceptable survival outcomes; however, their development and sustainability are primarily constrained by limited infrastructure, workforce shortages, financial barriers, legislative challenges, and insufficient public and professional education.

Methods:

A scoping review of relevant databases was performed to identify studies pertaining to active or historic LT programmes in low- and lower-middle income countries. Eligible articles addressed LT programme volumes, survival, as well as details of successes and barriers in establishing de novo programmes.

Results:

A total of 182 studies from 17 countries were included in the study. The majority were published in lower-middle income countries; only one low-income country, Syria, demonstrated evidence of a LT programme. Transplantation initiatives ranged from isolated transplants supported by international teams to large, well-developed national programmes such as in Egypt and India. Thematic analysis identified recurring barriers: limited resources including infrastructure, workforce and organs; high financial costs to patients and government; legislative challenges; and finally, lack education of the public and medical professionals. Access to LT in low and lower-middle income countries is very limited, however various transplantation programmes exist for patients who require care. Given that the burden of liver disease is highest in LMICs, efforts should be made to improve access to LT. Employing the experiences of other LT programmes in low resource settings may serve as a template, thereby bypassing some of the learning curve associated with de novo programmes. Context-adapted strategies informed by established programmes in comparable low-resource settings will improve access, programme sustainability, and patient outcomes in these regions.

Efficacy of Intradermal Methylene Blue Injections for Hemorrhoidectomy Post-Operative Pain: A Randomized, Blinded, Placebo-Controlled Trial

Presented by: Faith Trinh, PGY-1
Preceptor: Dr. Mark Dykstra

Background:

Hemorrhoidal disease results from increased pressure on the rectal venous plexus, leading to symptoms such as bleeding per rectum, itching, prolapse, and pain if external hemorrhoids are involved. Many conservative and minimally invasive therapies exist; however, excisional hemorrhoidectomy remains an option for those with internal hemorrhoids refractory to these treatments or with symptomatic, combined internal and external hemorrhoids. Post-operative pain remains one of the leading patient concerns. Intradermal methylene blue injections have been proposed as a minimally invasive pain relief therapy in the setting of excisional hemorrhoidectomies. Previous studies have shown significant improvement in pain control up to 4-6 weeks post-operative without an increase in concurrent complications.

Hypothesis:

We hypothesize that patients who receive methylene blue intradermal injection therapy will have improved post-operative pain scores, decreased average analgesic use, decreased presentations for pain control, and decreased postoperative complications relative to the control patients.

Methods:

This will be a multi-center, prospective, single-blind randomized controlled trial conducted in Edmonton, Alberta from June 2026-May 2029. Adult patients with stage II-IV hemorrhoids with an indication for elective hemorrhoidectomy at one of the participating sites will be included. Participants will be excluded if they have concurrent anorectal disease or infection, have any history of previous anorectal surgery, are breastfeeding, or have any contraindication to receiving methylene blue. 186 participants will be randomized into two groups with the treatment group receiving an intradermal injection of 5 mL of 1% methylene blue with 15 mL of 0.5% lidocaine, and the control group receiving an intradermal injection of 5 mL of normal saline and 15 mL of 0.5% lidocaine. Patients will be provided with a post-operative diary for 14 days post-operative to record their maximum pain on a visual analogue scale, the number and type of pain killers used, the number of bowel movements per day, and other post-operative complications noted. At their four-week follow-up, an anal physical examination and a repeat visual analogue scale will be completed. Data on demographics, preoperative and postoperative pain scores, painkiller use, postoperative complications, presentations to ED, and wound-healing will be collected. Categorical variables will be analyzed using the Chi-square test, and continuous variables will be analyzed using the Student's T-test or Mann-Whitney test.

Results:

No results are currently available as this project is in its proposal stage.

Risk Factors, Investigations, and Delay in Diagnosis in Canadian Patients with Gastroesophageal Adenocarcinoma

Presented by: Brianna Salverda, PGY-4
Preceptor: Dr. Daniel Schiller

Background:

Gastric cancer is the fifth most common cancer worldwide and the fifth leading cause of cancer death. In Canada, it is estimated that 4000 people will be diagnosed with gastric cancer, and 2000 will die each year. Early-stage disease may present with nonspecific symptoms, increasing the risk of diagnostic delay and limiting opportunities for curative treatment. Further, gastric cancer is less common in Canada compared to other parts of the world, often limiting the index of suspicion. The main objective of this study is to quantify the delay in diagnosis for Canadian gastric cancer patients and to examine factors associated with increased delays in diagnosis. Secondary objectives are to evaluate the accuracy of investigations ordered by primary care physicians, and to determine the effect of delay in diagnosis on the ability to offer curative intent treatment.

Hypothesis:

In Canada, patients with gastric cancer are often presenting with advanced, unresectable disease. We hypothesize that many patients who are eventually diagnosed have worrisome signs and symptoms for long periods of time before the diagnosis is established. Long delays in diagnosis may result in more advanced disease and lower chance of offering curative intent treatment. Due to a low index of suspicion and limited access to endoscopy, readily available investigations are sometimes ordered initially (abdominal ultrasound, upper GI contrast studies) which may provide false negative results further contributing to an increased delay in diagnosis.

Methods:

We performed a prospective observational study of patients with newly diagnosed gastric cancer using patients enrolled in 2 prospective Gastric Cancer databases. Diagnostic delay was defined as the time from symptom onset to histologic diagnosis. Demographics, presenting symptoms, and diagnostic investigations in the 12 months prior to diagnosis were collected. Diagnostic delay was compared between patients offered curative versus non-curative intent treatment (as well as pathologic stage if they underwent resection), and factors associated with delayed diagnosis were evaluated. The accuracy of an abdominal ultrasound and an upper GI contrast test in the investigation of gastric cancer patients was evaluated.

Results:

A total of 110 patients were included. The median age was 67 years, and 77 (70%) were male. The most common race/ethnicity was Western European/North American (62.7%), followed by Indigenous/Native Canadian (10.9%) and East Asian (7.3%). The median time from presentation to diagnosis was 117 days. Forty-five patients (40.9%) had a BMI of 18.5–24.9 kg/m², while 35 (31.8%) had obesity (BMI ≥30 kg/m²). A history of smoking was present in 66 patients (60.0%). Curative-intent treatment was offered to 62 patients (56.4%). The proportion offered curative treatment varied across diagnostic delay groups, ranging from 41.7% among patients diagnosed within 90–179 days to 73.3% among those diagnosed after >360 days, without a consistent trend. Upper gastrointestinal studies were performed in 24 patients (24.7%), and abdominal ultrasound in 26 patients (28.0%). Neither investigation was significantly associated with diagnostic delay.

Conclusion:

In this cohort, diagnostic delay was common, with a median interval of nearly four months from presentation to diagnosis. However, delay was not clearly associated with the likelihood of curative-intent treatment, and the use of early imaging modalities did not appear to influence diagnostic timelines. Further investigation is needed to identify patient and system-level factors contributing to delayed diagnosis of gastric cancer.

The Development of a Novel Model of ‘Good Surgical Judgement’ Using Aeronautical Decision Making

Presented by: Alexander Miles, PGY-5
Preceptor: Drs. Jonathan White, Simon Turner, & Brett Mador

Background:

Despite being considered a core attribute among surgeons, ‘good surgical judgment’ remains a poorly defined concept among clinicians. Previous research on surgical judgment has focused on the intraoperative decision-making environment. However, surgical judgement is a skill which surgeons apply to all their decision-making processes and ignoring extraoperative decision-making creates a deficit in our understanding of ‘good surgical judgment’. In contrast the surgical profession aviators have long had a holistic model of good pilot judgment termed “Aeronautical Decision Making”, which has been highly successful in improving pilot decision making and flight safety.

Hypothesis:

Leveraging the concept of parallel professions, Aeronautical Decision Making can be utilized as a guiding framework to support the development of a novel holistic model of ‘good surgical judgement’ addressing both the intra and extraoperative environments.

Methods:

Using constructivist grounded theory we conducted semi-structured interviews with 24 attending surgeons from 9 surgical specialties affiliated with a single Canadian institution. Interviews focused on how the participants conceptualized the process of ‘good surgical judgment’ and the Aeronautical Decision Making model was used as a framework to guide the creation of the interview guide and anchor the discussion. Convenience sampling followed by snowball sampling were used to achieve diversity in sampling. Data collection and analysis were iterative and guided by theoretical sampling. A conceptual model was generated from the data.

Results:

A total of 24 surgeons from representative surgical specialties were interviewed at which point theoretical saturation was achieved. Analysis of interview data identified a cyclical model of ‘good surgical judgment’ consisting of three major components: contextual factors, the decision cycle, and post decision evaluation. Surgeons utilize an iterative and holistic approach to surgical judgement both inside and outside of the operating room. This new conceptual model for ‘Good Surgical Judgment’ contributes to understanding surgical decision-making outside of the operating room and may serve as a conceptual framework to support the development of novel instructional and feedback tools to enhance the development of surgical judgment in trainees.



ABSTRACT SESSIONS 3 & 4

Association Between Sarcopenia and Overall Survival Following Pulmonary Metastasectomy for Colorectal Cancer Metastases

Presented by: Dunavan Morris-Janzen, PGY-3
Preceptor: Dr. Eric Bedard

Background:

Pulmonary metastasectomy is a potentially curative treatment for selected patients with metastatic colorectal cancer. However, identifying patients most likely to benefit from pulmonary metastasectomy remains a clinical challenge. Preoperative prognostic factors that may inform patient selection, including sarcopenia, remain underexplored.

Hypothesis:

Preoperative sarcopenia, defined by CT-derived skeletal muscle index, is associated with reduced overall survival following pulmonary metastasectomy for metastatic colorectal cancer metastases.

Methods:

We conducted a retrospective cohort study of consecutive patients who underwent index pulmonary metastasectomy at the Royal Alexandra Hospital between January 1, 2000, and December 31, 2021. Eligible patients were aged 18 years or older, had pathologically confirmed colorectal cancer metastases, and underwent preoperative CT imaging of the chest and abdomen within three months prior to metastasectomy. Baseline demographic and clinicopathologic variables known to be associated with overall survival were collected. Sarcopenia was defined according to sex-specific CT-derived skeletal muscle index (SMI) cut-points described by Baracos et al. ($\leq 52.4 \text{ cm}^2/\text{m}^2$ for males and $\leq 38.5 \text{ cm}^2/\text{m}^2$ for females). CT images were analyzed using SliceOmatic© version 4.3 by trained personnel to quantify the total cross-sectional skeletal muscle area at the L3 vertebral level, which was normalized to patient height.

Results:

A total of 182 patients were included; 177 were included in the survival analysis due to missing covariate data, with 111 observed deaths over a median follow-up of 5.2 years (IQR 2.5–9.0). Median skeletal muscle index (SMI) was $39.6 \text{ cm}^2/\text{m}^2$ for females and $49.6 \text{ cm}^2/\text{m}^2$ for males. Overall, 95 patients (52.2%) were classified as sarcopenic. Kaplan–Meier survival curves demonstrated significant separation by sarcopenia status (log-rank $\chi^2(2)=6.19$, $p=0.013$). Sarcopenia was associated with reduced overall survival in univariable Cox Proportional Hazards analysis (HR 1.60, 95% CI 1.10–2.34; $p=0.014$) and remained independently associated with reduced survival in multivariable analysis (HR 1.58, 95% CI 1.07–2.32; $p=0.021$). Other variables independently associated with worse survival included resected metastases $>2 \text{ cm}$, thoracic nodal stage $>N0$, previously controlled extra-thoracic metastases, and colorectal cancer primary tumor stage $\geq pT4$ (all $p<0.05$). Sarcopenia, defined by sex-specific SMI cut-points, was independently associated with shorter overall survival and increased risk of death following pulmonary metastasectomy for colorectal cancer metastases.

**Results from the Surgery for IBD Luminal Disease in Canadian Children (SILCC) Biobank: A
National Multi-Centre Surgical Research Resource for Pediatric Crohn's Disease.**

**Presented by: Paul Lerner, PGY-3
Preceptor: Dr. Troy Perry**

Background:

Surgically resected tissue offers unique opportunities for translational research in pediatric Crohn's disease (pCD) by enabling analysis of full-thickness intestinal pathology, which cannot be assessed using endoscopic biopsies. However, access to these specimens is limited. We established the first national surgical biobank for pCD through the Canadian Children IBD Network.

Hypothesis:

We hypothesized that a national, multi-centre surgical biobank for pediatric Crohn's disease is feasible and will yield high-quality biospecimens suitable for translational research.

Methods:

We conducted a prospective multi-centre cohort study of children aged 5-17.2 years with severe fibrostenotic pCD undergoing intestinal resection. Patients with intra-abdominal sepsis were excluded. Protocols were developed with the Canadian Children IBD Network and approved by institutional ethics boards. Surgeons from 9 of 12 Canadian children's hospitals were trained in standardized intraoperative collection of bowel, mesenteric fat, and lymph nodes. Surgical and clinical data were recorded. Biobank performance metrics included recruitment efficacy, protocol adherence, and tissue quality assessed through histology and nucleic acid integrity.

Results:

Since November 2023, biospecimens and clinical data from 55 patients have been collected (estimated recruitment efficacy of 45-78%), generating >1300 FFPE cassettes and >425 RNA_{later}-preserved specimens. Most patients underwent laparoscopic-assisted ileocolic resection (95%) median 4 months after diagnosis. Median resection length, hospital stay, and time to full diet were 19 cm, 5 days, and 3 days, respectively. Complications were rare: two deep surgical site infections managed non-operatively and one anastomotic dehiscence requiring reoperation and ostomy.

Tissue quality was high. Histologic review demonstrated clear separation of inflamed and non-inflamed bowel (median Geboes score 13 vs 0). DNA purity was high (median 260/280 ratio 1.95), and all tested RNA samples met quality thresholds (DV200 >50%; 45% with DV200 >70%).

Initial protocol adherence was 47%. Interim analysis identified shipping delays >72 hours as the main cause of deviations. Introduction of thermal stabilization gel packs and a modified shipping protocol improved adherence to 82%.

Preliminary spatial transcriptomic analysis demonstrates distinct molecular microenvironments across patient-matched inflamed bowel, non-inflamed bowel, and mesenteric lymph nodes, demonstrating the translational potential of this national surgical tissue resource.

Does Re-Staging PET Change Clinical Management Following Induction Chemoimmunotherapy for Lung Cancer? A Retrospective Cohort Study

Presented by: Natalie Gugala, PGY-3
Preceptor: Dr. Simon Turner

Background:

The addition of checkpoint inhibitor therapy has significantly improved treatment for locally advanced lung cancer. The landmark clinical trial CheckMate 816 evaluated the addition of nivolumab to standard platinum-based neoadjuvant chemotherapy and demonstrated improved pathologic complete response, event-free survival and overall survival. The local practice in Edmonton is to obtain re-staging PET following induction therapy and prior to surgery. The clinical utility of re-staging PET for lung cancer patients treated with induction chemoimmunotherapy has not been well studied.

Hypothesis:

We hypothesized that re-staging PET does not frequently alter clinical management following induction chemoimmunotherapy. We sought to explore whether clinical nodal stage, overall clinical stage, histology, induction cycle delay or termination, or time interval between last induction cycle and re-staging PET was associated with changed management.

Methods:

We conducted a retrospective cohort study on patients with lung cancer who underwent induction chemoimmunotherapy followed by re-staging PET prior to planned surgical resection at the Royal Alexandra Hospital between April 1, 2023 to January 31, 2026. Changed management was defined as any deviation from routine clinical management following re-staging PET. Uncertain cases were reviewed with the attending thoracic surgeon to determine consensus. Statistical associations between changed management and explanatory variables were exploratory given low cell counts. Fisher's Exact Test and Wilcoxon Rank-Sum Test were used for categorical and continuous variables, respectively.

Results:

82 patients were included in analysis. Histopathology was predominately adenocarcinoma (65.9%) and squamous cell carcinoma (30.5%). Most cancers were clinical node stage N0 (35.8%), cN1 (27.2%) or cN2 (33.3%). Overall clinical stage was IIB (30.5%), IIIA (52.4%) and IIIB (11%). Induction therapy was completed in 90.2% and without cycle delays in 76.8% of patients. Median time from start of final induction cycle to re-staging PET was 23 days (IQR 16-29). Re-staging PET findings changed management in 4/82 patients (4.9%). Of these four, two patients benefited while two had false negative results and underwent unnecessary invasive diagnostic procedures. Common re-staging PET findings among patients whose management changed were tumor progression (2/4 vs. 3/78 patients, $p=0.017$), nodal progression (2/4 vs. 3/78 patients, $p=0.017$) and new regional disease (2/4 vs. 4/78 patients, $p=0.025$). Exploratory analysis revealed no association between changed management and histology ($p=0.22$), clinical node stage ($p=0.89$), overall clinical stage ($p=0.67$), induction cycle delay ($p=0.23$) or induction treatment completion ($p=0.34$). The median time from final induction cycle to re-staging PET tended to be longer among those whose management changed compared to those whose management did not change (39 days, IQR 28-48 vs. 22.5 days, IQR 16-28 [$p=0.051$]).

The Impact of Serum Albumin on Definitive Endoderm Differentiation and Downstream Islet Identity

Presented by: Zofia Czarnecka, PGY-3
Supervisor: Dr. James Shapiro

Background:

Stem cell derived islets (SC-islets) offer a promising alternative to donor islets for diabetes cell therapy. A successful SC-islet product is contingent on efficient Stage 1 (S1; definitive endoderm, DE) induction, which is largely dependent on serum additives to prevent cell loss and critical for establishing downstream pancreatic identity and endocrine differentiation. The use of xenogeneic components such as bovine serum albumin (BSA), however, constitutes a major component in current differentiation protocols, presenting potential regulatory challenges for clinical translation.

Hypothesis:

We hypothesize that GMP-grade HSA could replace BSA during stem cell differentiation without compromising definitive endoderm induction and SC-islet functional identity.

Methods:

Definitive endoderm induction was evaluated in H1 ESCs and our laboratory-derived induced pluripotent stem cell line (NDO4) using a published research-grade protocol supplemented with 0.5% BSA and compared with 0.5% GMP-grade HSA and a serum-free condition. The commercial STEMdiff™ DE kit served as a positive control. DE cell composition for SOX17⁺FOXA2⁺ cells was assessed by flow cytometry, immunohistochemistry and quantitative gene expression analysis. Cells from all conditions were further differentiated to Stage 4 (S4; pancreatic progenitor) and Stage 6 (S6; SC-islets). SC-islet functional maturation was assessed using dynamic perfusion assays, metabolic phenotyping, and in vivo function following transplantation.

Results:

Following serum replacement, DE (S1) achievement (marked by SOX17⁺FOXA2⁺ expression) was not significantly different between DE Control (87.3% ± 1.2%), BSA (85.2% ± 1.5%), and HSA (82.7% ± 1.8%) conditions (p>0.05). Downstream S2–S4 differentiation yielded similar pancreatic progenitor populations (>90% PDX1⁺NKX6.1⁺ cells) in S4 clusters with comparable morphology and size distribution (p>0.05). At S6, SC-islet identity and endocrine hormone cell composition were largely preserved across conditions. Flow cytometry demonstrated robust generation of β-like cells, although CPEP⁺NKX6.1⁺ populations differed between BSA and HSA groups (p=0.0028). Intracellular insulin content was maintained across all groups (p<0.0001), but HSA-derived SC-islets exhibited a marked reduction in glucose-stimulated insulin secretion and KCl-induced depolarization, suggesting impaired stimulus–secretion coupling. Control STEMdiff and BSA-derived SC-islets remained functionally responsive, demonstrating >2-fold glucose-stimulated insulin secretion. Following transplantation into mice, HSA-derived SC-islets secreted significantly lower levels of detectable human C-peptide at 8 and 12 weeks post-transplantation (<20 pM) compared to BSA-derived SC-islets (100–300 pM).

Conclusion:

GMP-grade HSA supports efficient definitive endoderm induction and downstream endocrine differentiation without significant differences in cell composition and endocrine gene expression. However, HSA exposure is associated with impaired functional maturation of SC-islets. These findings highlight a discordance between endocrine identity and glucose-responsive insulin secretion and suggest that further optimization of xeno-free differentiation conditions will be required to preserve β-cell metabolic function in clinical protocols.

Deep Learning Prediction of Periapillary Cancer Resectability from Preoperative CT Imaging

Presented by: Hasnaien Ahmed, PGY-3

Preceptor: Dr. David Bigam

Background:

Periapillary cancers, particularly pancreatic ductal adenocarcinoma (PDAC), have poor survival, with surgical resection representing the only potentially curative treatment. However, 15–38% of patients with pancreatic head cancers deemed radiologically resectable undergo futile surgical exploration when unresectable disease is identified intraoperatively. This exposes patients to unnecessary morbidity, generates economic and environmental costs to the healthcare system, and delays entry into palliative or neoadjuvant therapy pathways during postoperative recovery. Artificial intelligence (AI) offers advantages beyond the current gold standard of human CT interpretation, including the ability to detect subtle imaging patterns, integrate complex anatomical relationships across large datasets, standardize interpretation across centers, and provide scalable decision support in settings lacking specialized expertise. Existing AI models for this task are trained primarily on radiologist-labeled scans, which may not reflect the clinical reality in which surgeons determine operative candidacy based on their own CT interpretation.

Hypothesis:

Can a deep learning model trained on surgeon-labeled CT scans reach a hepatopancreaticobiliary (HPB) surgeon's predictive accuracy in a binary classification task of resectability?

Methods:

We conducted a retrospective methodology-based study to develop an AI model using cases sampled from the Edmonton Pancreatic Inflammation and Cancer (EPIC) referral database and the University of Alberta operating room registry. Twenty-nine anatomical structures were segmented in the portal venous phase of each patient's preoperative CT scan, including tumour, major vascular structures relevant to resectability determination, and surrounding organs for anatomical context. For this proof-of-concept analysis, 22 patients were included after protocol exclusions, with 17 cases used for training and 5 cases reserved for validation. A deep learning model was implemented using COLIPRI, a large pre-trained 3D vision transformer trained on approximately 78,000 paired medical images and radiology reports. The backbone weights were frozen and a linear classifier was trained on extracted imaging features to predict resectability.

Results:

Five scans were held out for validation (3 resectable, 2 unresectable). The model correctly classified 4 of 5 cases, corresponding to an overall accuracy of 80%. Sensitivity for detecting unresectable disease was 50% (1/2). The single misclassified case involved a patient clinically deemed unresectable but predicted by the model as resectable. Retrospective expert review of the CT scan similarly categorized this tumour as borderline resectable. These preliminary findings demonstrate the feasibility of applying transfer learning approaches to CT-based prediction of pancreatic tumour resectability using surgeon-labeled imaging data. Expansion of the dataset is ongoing to enable more robust validation of model performance.

Development of an Automated Artificial Intelligence Algorithm for Interpretation of Rectal Cancer MRI: Two- and Three-Dimensional Tumour-Staging

Presented by: Susan Muncner, PGY-4
Preceptor: Dr. Haili Wang

Background:

Accurate staging of rectal cancer (RC) on MRI is essential for treatment planning but remains challenging. Review by multiple interpreters can improve diagnostic precision, but ongoing discrepancies are well-described. While artificial intelligence (AI) has been applied successfully in medical imaging, automated clinical application for RC MRI staging has not yet been demonstrated.

Hypothesis:

We hypothesize that an automated AI algorithm will be able to interpret T-stage of RC MRI with a performance comparable to human interpretation.

Methods:

We retrospectively analysed 51 patients who underwent elective colorectal surgery with pre-operative MRI at our centre (Nov 2018-Feb 2023). Bowel and tumour extent were labelled on 2D MR images by a single expert user in the oblique-axial plane and reviewed by a specialized RC radiologist. Data were split: 82% (42 patients/1245 images) for training and 18% (9 patients/267 images) for testing, ensuring strict separation. A custom, parameter-efficient model integrating the hierarchical vision transformer (Hiera) encoder from SAM2 (a foundation model trained on a large set of natural images and videos) with a lightweight U-Net decoder was used. The model consisted of three main components: a frozen pretrained encoder, trainable adapter modules inserted at each transformer block, and a lightweight U-Net decoder with skip connections. Performance was evaluated using Dice score for segmentation, and sensitivity, specificity, and accuracy for tumour detection and T-stage classification. Test results were awarded a qualitative score (grade A: correct T-stage/correct contours, grade B: correct T-stage/incorrect contours; grade C: incorrect T-stage).

Results:

Our model achieved an average Dice score of 74.3%. The sensitivity of tumour identification was 87.1%, specificity was 83.5%, and accuracy was 85.4%. The sensitivity of T3 tumour detection (vs T1/2 or bowel) was low at 9.3%, with specificity 99.5%, indicating the algorithm's underestimation of presence of T3 tumours. Correct T-stage was identified in 70.8% of cases. On qualitative assessment, 44.6% were grade A images (n=119) and 25.5% were grade B images (n=68). This study represents the early stages of development of an automated AI algorithm for RC MRI interpretation. These results show promising staging performance in tumour detection and staging accuracy overall, while discrimination between T2 and T3 tumours requires improvement. Further studies will include multicentre training data to improve the accuracy of the algorithm.

Assessing the Feasibility and Efficacy of Enhanced Stress Resiliency Training (ESRT) within the Surgical Foundations Academic Half-Day at the University of Alberta – A Pilot Study

**Presented by: Alexander Miles, PGY-5
Preceptor: Drs. Simon Turner & Carter Lebares**

Background:

The impact of stress on surgeon performance and surgical resident education is being increasingly recognized. While a surgical resident's ability to manage and cope with stress has previously been thought of as an inherent quality, a growing body of literature demonstrates that stress management skills can be taught and acquired through dedicated instruction. The Royal College of Physicians and Surgeons of Canada now include learning objectives related to the recognition and management of stress as part of the learning outcomes required for the Surgical Foundations curriculum. Enhanced Stress Resiliency Training (ESRT) is an evidence-based curriculum that has demonstrated a number of benefits in surgical residents but has not been utilized with the Canadian surgical training environment before. In 2025 the University of Alberta Surgical Foundations Program implemented ESRT within the Surgical Foundations academic half day curriculum. The purpose of this study was to assess the feasibility and efficacy of ESRT as it was piloted among 1st year surgical residents at the University of Alberta.

Hypothesis:

Our hypothesis is that ESRT will be found to be feasible from a cost and resource perspective, demonstrate efficacy in reducing 1st year surgical resident burnout, and be considered valuable by 1st year surgical residents.

Methods:

The ESRT course was piloted during 5 consecutive Surgical Foundations academic half days between September – October 2025. 1st year surgical resident stress, burnout, and mental health were evaluated using the Perceived Stress Reactivity Scale, the Maslach Burnout Inventory Human Services Survey, and the Mental Health Continuum Short Form respectively. Assessment in all 3 domains was conducted prior to, immediately following, and 6 months post completion of the ESRT curriculum. Resident satisfaction and acceptability were evaluated using an open-ended feedback questionnaire. Curriculum feasibility was assessed through cost analysis and seeking feedback from curricular stakeholders including residents, Surgical Foundations Program administrators, and the ESRT course instructor.

Results:

There were no statistically significant changes in resident perceived stress, burnout, or mental health following completion of the ESRT course. Though, statistical power was limited by resident response rate. Resident feedback indicated a perceived benefit and satisfaction with the ESRT curriculum. Feasibility challenges included the limitations of a virtual format and remote instruction, difficulties in obtaining an adequate environment on campus to facilitate ESRT instruction, resident distraction by clinical duties, and resident perception of an institutional culture not conducive to supporting adoption of ESRT principles. Cost analysis revealed a total cost of 103.36\$ CAD per resident.

General Surgery Alumni

1988

David Callahan
Norman Causton
Owen Heisler
Ciaran McNamee

1989

Mark Cattral
Harold Chyczij
Robert Hagerman
David Sigalet
Gary Soenen

1990

Don Buie
Gary Gelfand
Franco Leoni
Michael Meier
John Urschel

1991

Wojciech Brzezinski
Kelly Dabbs
Lawrence Farries
William Sanden

1992

Abdulaziz Al-Baradai
Faiz Daudi
Neil MacEachern
Douglas May
Katherine McCuaig

1993

Paul Hardy
Helen MacRae
Douglas Matheson
Carole Spread

1994

Saud Al-Jadaan
Winston Chan
Deepak Katyal
Grant O'Keefe
Walter Yakimets

1995

Antony Gomes
Andrew Graham
James Okamura
Robert Turnbull
Michael Willerth
Emmanuel Rozenthal

1996

Saad Al-Shehri
Jon Just
Randy Moore
Natalie Yanchar

1997

George Chang
David Bigam
Martin Friedlich
Alan Sobey
Gerritt Winkelaar

1998

Michael Chatenay
Camille Hancock Friesen
James Shapiro
David Williams
Geoff Porter

1999

Syed Ahsan-Ud-Din
Christopher Blewett
Damien Byrne
Michael Gorman
Morad Hameed

Michael Moser
Cort Pagenkopf
Randy Pulis
Kenneth Stewart

2000

Dale Berg
Sandrasekaram Parameswaran

2001

Karim Alibhai
Jana MacLeod
Shane Mortimer
Edward Solano
Peter Miles

2002

Coreen Dyck
Abdulrahman Al-Zahem
Brian Louie
David Mercer

2003

Jessica Abraham
Jennifer Andruchow
James Baughan
Matthew Muirhead
Sean Norris
Clifford Sample
Daniel Schiller

2004

Jeffrey Gaboury
Tina Mele
David Olson
Ronald St Germaine
Naureen Wasey

2005

Mona Saleh
David Hochman
Kyriacos Panayides
Drew Sutherland
Mansour Tawfeeq

2006

Maurice Blitz
Erika Haase
Belinda His Dickie
Hossein Shayan
Rafat Taher

2007

Alhassan Asiri
Anise Barton
Bryan Dicken
Kamran Fathimani
Rachel Khadaroo
Todd McMullen
Sulaiman Nanji
Panayiotis Panayides
Karim Somani
Tom Wallace

2008

Musaed Al-Ghamdi
Abdulmutalib Al-Masloom
Panayiotis Panayides
Paul Engels
Scott Johnson
Lorraine Law
James Stewart
Haili Wang

2009

Matthew Butler
Bushr Mrad
John Paton-Gay

2010

Saleh Al-Ghamdi
Parveen Boora
Sonia Cader
Wayne Truong
Harvey Hawes

2011

Akram Al-Jahdali
Athena Bennett
Anna Borowiec
Ali Cadili
Daniel Kopac
Dereck Mok
Jean-Sebastien Pelletier

2012

Rani Al-Sairafi
Basem Al-Shareef
Kevin Klingbeil
Sarah Lai

2013

Corey Tomlinson
Chieh Chiu
Namdar Manouchehri
Bonnie Tsang

2014

Talal Ali
Richdeep Gill
Myung Hwae Kim
Allison Maciver
Michael McCall
Dana Mihalicz
Simon Turner
Andrey Vizhul
Sharon Chiu

2015

David Al-Adra
Tyler Alford
Ahmed Almamar
Johan Bolton
Sayf Gazala
Allison Hobbs
Shaheed Merani
Tyler Parrington
Abdullah Saleh
Amir Taheri

2016

Suzana Kupper
Mike Saba
Brandi Ilo
Blair Anderson
Johnny Chau
David Ko
Troy Perry
Rene Razzak
Jed Scharf
Brenden van der Westhuizen
Pang Young
Courtney Fulton

2018

Sameer Apte
Angela Chan
Mark Dykstra
Girma Gamme
Erica Lester
David Lim
Noah Switzer

2019

Amandeep Bajwa
Simon Byrns
Sidian Chen
Gilgamesh Eamer
Fady Kamel
Taylor Smart
Kevin Whitlock

2020

Alreem Al-Hinai
Ariella Kleiman
Michael Laffin
Mackenzie Lees
David Lesniak
Lanny Li
Ashley Shaw

2021

Nasser Abualhassan
Elizabeth Clement
Mustafa El-Hadi
Jessica Hopkins
Krista Lai
Igor Mihajlovic
Blanka Saravana-Bawan
Iran Tavakoli

2022

Shaun Cowan
Jerry Dang
Ashley DiPasquale
Chantalle Grant
Farah Ladak
Awrad Nasralla
Jordan Nostedt

2023

Hayley Forbes
Christine Li
Andrew MacDonald
Alyssa MacLean
Warren Sun
Natalie Chua
Matthew Connell
Christopher Dwyer
Anna Mierzwa
Valentin Mocanu
Joanna Ryan
Susie Youn

2025

Sam Albacete
Sydney Candy
Alexandra Hetherington
Sarah MacVicar
Cheyenne McLean
Jenelle Pederson
Kieran Purich
Dan Skubleny

**Alumni recognition page is a work in progress – please let us know if any errors or omissions have been made*