

Department of Surgery  
WESTERN UNIVERSITY

**16<sup>TH</sup> ANNUAL  
DR. ROBERT ZHONG DEPARTMENT OF  
SURGERY RESEARCH DAY**

Wednesday, November 11, 2020  
Zoom Webinar

## Contents

Program at a Glance.....	3
Biography of Dr. Robert Zhong .....	4
<b>RESIDENT ABSTRACTS.....</b>	<b>5</b>
Presenter #1: Luke Hartford .....	5
Presenter #2: Patrick Wang.....	6
Presenter #3: Bonnie Liu.....	7
Presenter #4: Geoff Masschelein .....	8
Presenter #5: Shane Smith.....	9
Presenter #6: Robin Wigen.....	10
Presenter #7: Rachel Liu.....	11
Presenter #8: Nick Mitrou .....	12
Presenter #9: Nader Aboelnazar .....	13
Presenter #10: Jeremy Cepek .....	14
Presenter #11: Farhad Ghasemi .....	15
Presenter #12: Silvio Ndoja .....	16
Presenter #13: Lyndsay Glass .....	17
Presenter #14: Kathleen Nelligan .....	18
Presenter #15: Eric Walser.....	19
Presenter #16: Evelyn Waugh .....	20
<b>DEPARTMENT OF SURGERY NODE PRESENTATIONS &amp; DRAGON’S DEN PITCHES .....</b>	<b>21</b>
<b>Node Productivity: Dr. Kelly Vogt.....</b>	<b>21</b>
<b>FUNDAMENTAL SCIENCES &amp; SURGICAL INNOVATION NODE SPEAKER: Dr. Gregor Reid.....</b>	<b>21</b>
<b>SURGICAL EDUCATION NODE SPEAKER: Dr. Aaron Grant .....</b>	<b>21</b>
<b>FACUTLY DRAGON’S DEN PITCHES: .....</b>	<b>21</b>
<b>ICES NODE SPEAKER: Dr. Ahmad Elnahas.....</b>	<b>21</b>
<b>QUALITY IMPROVEMENT &amp; PATIENT CENTERED NODE SPEAKER: Dr. Ryan Degen .....</b>	<b>21</b>
<b>FACULTY DRAGON’S DEN PITCHES: .....</b>	<b>21</b>
<b>RESIDENT DRAGON’S DEN PITCHES.....</b>	<b>22</b>

Program at a Glance

**Research Day 2020**

**Zoom Webinar**

**November 11, 2020**

1:00 - 1:10 PM	OPENING REMARKS: DR. EMIL SCHEMITSCH
1:10 - 1:15 PM	DR. WALKER RESEARCH AWARD ANNOUNCEMENT
1:15 - 2:15 PM	RESIDENT RESEARCH PAPERS
2:15 – 2:35 PM	BREAK
2:35 – 3:55 PM	RESIDENT RESEARCH PAPERS
3:55 – 4:00 PM	BREAK
4:00 – 4:15 PM	OVERVIEW OF NODE PRODUCTIVITY
4:15 – 4:25 PM	NODE PRESENTATION – FUNDAMENTAL SCIENCES & SURGICAL INNOVATION
4:25 – 4:35 PM	NODE PRESENTATION – SURGICAL EDUCATION
4:40 – 5:00 PM	FACULTY DRAGON’S DEN PITCHES 1 <sup>ST</sup> GROUP
5:00 – 5:10 PM	NODE PRESENTATION – ICES
5:10 – 5:20 PM	NODE PRESENTATION – QUALITY IMPROVEMENT & PATIENT CENTERED
5:20 – 5:30 PM	BREAK
5:30 – 5:45 PM	FACULTY DRAGON’S DEN PITCHES 2 <sup>ND</sup> GROUP
5:45 – 5:50 PM	VOTING FOR FACULTY DRAGON’S DEN PITCHES
5:50 – 6:00 PM	RESIDENT DRAGON’S DEN PITCHES
6:00 -6:05 PM	VOTING FOR RESIDENT DRAGON’S DEN PITCHES
6:05 – 6:10 PM	SCILLEY SCHOLAR ANNOUNCEMENT
6:10 – 6:20 PM	AWARDS, CLOSING REMARKS & COMPLETION OF ON-LINE EVALUATIONS

## Biography of Dr. Robert Zhong



Named in honour of Dr. Robert Zhong, a brilliant scientist and colleague who passed away in London, Ontario on September 8, 2006. Dr. Robert Z. Zhong was born in Shanghai, China on January 16, 1946. He graduated from Shanghai No 1 Medical University and was then assigned by the government to work as a general surgeon in a community hospital. Dr. Zhong attended a seminar led by Dr. Sun Lee – considered to be the founding father of experimental microsurgery – and whom he would later credit to be one of the most important mentors of his life.<sup>1</sup> Dr. Zhong arrived in Canada first as a research fellow under the supervision of Drs. John Duff and Calvin Stiller in 1984. His persistence and vision led to a full-time appointment and microsurgical animal models that would be applied in human transplantation clinical practice. Recognizing that molecular biology and transplant immunology were critical to the future of transplantation, Dr. Zhong began his study of these fields in Canada to become one of the world's leading experts in transplantation and microsurgery. He went on to become a Tier One Canada Research Chair in Transplantation and Experimental Surgery in 2004 and was appointed a full Professor in the Departments of Surgery, Pathology, and Microbiology & Immunology at The University of Western Ontario. Dr. Zhong was a scientist at the Robarts Research Institute; Director of the Microsurgery Laboratory at LHSC; and a scientist at the Lawson Health Research Institute. Dr. Zhong's influence into the fields of transplantation and microsurgery were profound and far-reaching. He was Past President of the International Society of Experimental Microsurgery; a member of the Canadian Society of Transplantation, American Society of Transplantation; and the American Society of Transplant Surgeons. Dr. Zhong was awarded the Lifetime Achievement Award by the Canadian Society of Transplantation posthumously in 2007.

1. Zhong T. (2007), Dr. Robert Zhen Zhong: A tribute by his daughter. *Microsurgery*, 27:214-2

## RESIDENT ABSTRACTS

### Presenter #1: Luke Hartford

Division: General Surgery

Node: Quality Improvement & Patient Centered Node

#### **Effect of Multidisciplinary Conference on Treatment Plan for Patients with Inflammatory Bowel Disease**

L. Hartford, L. Allen, H. Lennox, V. Jairath, J. Van Koughnett

**Background:** Inflammatory bowel disease is a complex disorder and reflects a wide variation of clinical practice. Multidisciplinary conference presentation may assist with challenging decisions regarding diagnosis, monitoring, and treatment planning.

**Methods:** A weekly multidisciplinary case conference was instituted at LHSC in March, 2017 to discuss complicated gastrointestinal patients with inflammatory bowel disease. To evaluate if case presentation resulted in a change in management plan, patients presented were prospectively analyzed from July 2017 to July 2019. A change in final management was defined as admission to hospital, surgery, referral to a colorectal surgeon, total parenteral nutrition, start/change in biologic therapy, start/change of steroids, or start of other medications. Secondary outcomes included the involvement of specialists and other referrals. The data was evaluated using frequencies and means with standard deviations.

**Results:** In 63 multidisciplinary conferences, 181 patients were presented. After excluding 48 patients, 136 patients met the inclusion criteria of inflammatory bowel disease (Crohn's n=45, ulcerative colitis n=88, undifferentiated n=3). There were 110 (81%) outpatient vs. 26 (19%) inpatient cases presented. Indications for presentation included 71 (52%) patients presented for chronic IBD management > 1 year, 37 (27%) with an acute flare in a chronic IBD patient, and 24 (18%) with a new diagnosis of IBD. A change in final management plan was recommended in 35 (26%) of patients. The most common recommended consensus change to the initial treatment plan was a surgical referral in 17 (13%), surgery in 12 (9%) patients or change in biologic therapy 11 (8%). Compliance with the consensus recommendations was 85%.

**Conclusion:** Presentation of patients with inflammatory bowel disease at multidisciplinary conference may change management for complex patients, especially in regards to surgery or change in biologic therapy.

## Presenter #2: Patrick Wang

Division: Orthopaedic Surgery

Node: Fundamental Sciences & Surgical Innovation Node

### **Possible Therapeutic Application of CORM-3-Derived Carbon Monoxide in Acute Limb Compartment Syndrome**

P. Wang, A-R. Lawendy, R. Bihari

**Introduction:** Surgical fasciotomy remains the only treatment in acute limb compartment syndrome (CS). Systemic application of carbon monoxide-releasing molecule-3 (CORM-3) in animal models of CS has shown potential but has never been tested without fasciotomy.

**Hypothesis:** CORM-3 can extend the surgical window and reduce the deleterious effects of ACS.

**Materials and Methods:** Twenty-eight male adult Wistar rats were randomly assigned into 3 groups: sham, CS with inactive CORM-3 (iCORM-3) and CS with CORM-3. CS was induced by elevation of intracompartmental pressure (ICP) through an infusion of isotonic saline into the hind limb, maintained for 2 hours. CORM-3 or iCORM-3 was then injected. Microvascular perfusion using % continuously-perfused, intermittently-perfused and non-perfused capillaries (CPC, IPC, NPC respectively); cellular injury (ethidium bromide:bisbenzimidazole staining, EB/BB); and inflammatory response (adherent and rolling leukocytes) in the extensor digitorum longus muscle were assessed using intravital video microscopy 24, 48 and 72 hours post-CS.

**Results:** Elevation of ICP resulted in significant microvascular perfusion deficits at 24, 48, and 72hr post-CS ( $39\pm 5\%$ ,  $44\pm 10\%$ ,  $35\pm 4\%$  CPC respectively vs  $79\pm 9\%$  in sham;  $35\pm 5\%$ ,  $29\pm 7\%$ ,  $35\pm 4\%$  NPC respectively vs  $11\pm 3\%$  in sham,  $p < 0.001$ ), increased tissue injury (EB/BB:  $0.31\pm 0.08$ ,  $0.41\pm 0.08$ ,  $0.40\pm 0.10$  respectively vs  $0.03\pm 0.01$  in sham,  $p < 0.001$ ) and adherent leukocytes ( $6\pm 1$ ,  $8\pm 2$ ,  $7\pm 1$  respectively vs  $1\pm 0$  in sham,  $p < 0.001$ ). CORM-3 restored the number of CPC at all time points (24, 48, 72hr) post-CS ( $57\pm 3\%$ ,  $61\pm 2\%$ ,  $52\pm 7\%$  respectively,  $p < 0.01$ ), reduced tissue injury (EB/BB:  $0.15\pm 0.04$ ,  $0.17\pm 0.04$ ,  $0.20\pm 0.04$  respectively,  $p < 0.001$ ), and diminished leukocyte adhesion ( $2\pm 1$ ,  $1\pm 0$ ,  $3\pm 1$  respectively,  $p < 0.001$ ).

**Discussion:** CORM-3 without fasciotomy showed improved microvascular perfusion, reduced tissue injury and diminished leukocyte activation at different time points, indicating its potential in prolonging the surgical window of CS.

## Presenter #3: Bonnie Liu

Division: Urology  
Node: ICES Node

### **High risk of clostridium difficile infection from the use of antibiotics commonly used to treat urinary tract infections in spinal cord injury patients**

B. Liu, J. Reid, M. Silverman, B. Welk

**Introduction:** Perceived and culture positive UTIs are a common reason for spinal cord injury (SCI) patients to use antibiotics. Antibiotic use can lead to *C. difficile* infection (CDI) which has high morbidity and mortality.

**Hypothesis:** We hypothesize that UTI-related antibiotics are frequently used in SCI patients, which increases the relative risk of CDI from exposure to these antibiotics.

**Materials & Methods:** We used routinely collected data from the province of Ontario to conduct a retrospective, cohort study. We identified people >18 years of age who had a traumatic, non-fatal SCI between April 1 2003 and March 31 2017. The primary exposure was an outpatient UTI-relevant antibiotic prescription during our observation period, and the primary outcome was evidence of a CDI. An adjusted cox proportional hazards model was used, and antibiotic exposure was modelled as a time-varying variable.

**Results:** We identified 2,528 patients with SCI that met our inclusion criteria. 1,642 (65%) were exposed at least once to an antibiotic of interest during follow-up. The most commonly prescribed UTI-related antibiotic was a fluoroquinolone (34%). Most patients did not receive investigations for a UTI prior to use of any of the different antibiotic classes. A small number of patients (138, 5%) were started on a chronic (>3 months) course of a UTI-relevant antibiotic. The overall proportion of patients diagnosed with CDI was 7.4% (188), with a rate of 9.3/10,000 patient days. Exposure to UTI-relevant antibiotics was associated with an aHR of 2.9 (98% CI 2.0-4.3,  $p < 0.01$ ) for CDI.

**Conclusions:** A significant proportion of patients with SCI are exposed to UTI-relevant antibiotics, and most do not have UTI-related investigations carried out. The rate of CDI in this population is similar to that of hospitalized patients. Given the increased risk for CDI in SCI patients exposed to UTI-relevant antibiotics, efforts to reduce unnecessary UTI-related antibiotic use should continue.

## Presenter #4: Geoff Masschelein

Division: Plastic & Reconstructive Surgery

Node: Fundamental Sciences & Surgical Innovation Node

### **Multidisciplinary oncoplastic lumpectomy for large defects – techniques, outcomes, and logistical considerations**

G. Masschelein, A. Cherukupalli

**Introduction:** Oncoplastic Breast Reconstruction (OPBR) is a challenging field with growing demand. Our study aims to analyze selection, surgical techniques and outcomes of patients who underwent a large volume lumpectomy (20-50% volume or level 3) with OPBR at a single centre. Secondary outcomes include a descriptive analysis of interdisciplinary operative planning logistics.

**Hypothesis:** With close attention paid to patient selection, and an established multidisciplinary care team in place, OPBR will be a suitable reconstructive option for women undergoing large volume lumpectomy.

**Methods:** A retrospective chart review of patients in a single centre who underwent level 3 OPBR between July 1, 2016 and September 1, 2019 in London, Ontario was conducted. Data collected included demographics, surgical techniques, tumour characteristics, and patient outcomes.

**Results:** Twenty-four patients were identified to have received level 3 OPBR. Average age and BMI at surgery were 53.6 (37-73) years and 31.2 (21.7-46.4) kg/m<sup>2</sup> respectively. Breast cup size ranged from C—DDD cup, and all breasts had grade 2 or 3 ptosis. Average oncologic resection weight was 176.2 (54 – 446) grams. Wise-pattern dermoglandular flaps were used for all 24 OPBRs. The nipple areolar complex (NAC) was preserved in 23 breasts, and excised in 1. Seventeen breasts required two or more dermoglandular pedicles to fill the lumpectomy defect. No skin flap or NAC necrosis were reported in the OPBR breasts.

**Conclusions/Discussion:** Breast-conservation is a challenge for larger cancers requiring excision of 20-50% breast volume. Such cases are classified as Level 3 oncoplastic cases and benefit from the expertise of plastic surgeons to optimize aesthetic outcomes. In our study, various dermoglandular and adipofascial flaps were employed, alone or in combination, to address these large lumpectomy defects, with good cosmesis and no reports of skin flap or NAC necrosis.



## Presenter #5: Shane Smith

Division: Vascular Surgery

Node: Quality Improvement & Patient Centered Node

### **Management of Vascular Trauma across Canada: A cohort study with implications for practice**

S. Smith, L. Allen, K. Kwajha, E. Joos, C. Ball, P. T. Engels, F. Naji, J. Lampron, S. Widder, S. Minor, S. Jessula, N.G. Parry, K. N. Vogt

**Introduction:** The aim of this study was to provide a description of vascular trauma and its management at centers across Canada.

**Methods:** This was a 5-year retrospective study of trauma patients at 8 Canadian level 1 trauma centres. ICD-10 codes were used to identify adult patients with major vascular injury, defined as injury to named vessel(s) in the legs, arms torso, and neck.

**Results:** 1330 patients were included. They were 76% male with a mean age of 43 years. Injuries were 63% blunt, 36% penetrating, and <1% mixed. The most common mechanisms of injury were motor vehicle collision (36%), stabbing (26%), and falls (16%), with gunshot injuries accounting for <5%. Pre-hospital tourniquets were applied in only 27 patients (2%). The mean Injury Severity Score (ISS) was 24; 70% had an ISS >15. A minority (14%) presented with systolic BP <90 mmHg. Injuries were most commonly identified by CT (54%) and operative exploration (33%). Injuries were to named vessels of the neck (32%), thorax (23%), abdomen and pelvis (27%), upper (14%) and lower extremities (10%). Specific injuries included transection (50%), complete occlusion (11%), partial occlusion (39%), and pseudoaneurysm (11%). Injuries were managed non-operatively in 32%, by definitive open surgical management (24%), endovascularly (10%), and with damage control techniques (3%). Amputation occurred in 12% of lower limb vascular injuries and 5% of upper limb injuries. Responsibility for vascular injury management was by 17 different types of specialists, the most common of which were vascular surgeons (31%), trauma surgeons (19%), and interventional radiologists (15%). Overall, in-hospital mortality was 13%, and 5% of patients died before definitive management of the vascular injury.

**Conclusions:** The variability in injury mechanisms, management strategies, specialty responsible for management, and outcomes have important implications for practice change and knowledge translation.

## Presenter #6: Robin Wigen

Division: General Surgery

Node: Quality Improvement & Patient Centered Node

### **Sustainability of a narcotic reduction initiative: One year following the Standardization of Outpatient Procedure (STOP) Narcotics Study**

R. Wigen, E. Walser, L. Hartford, JA. VanKoughnett, P. Murphy, K. Vogt, R. Hilsden, C. Clarke, N. Parry, D. Gray, L. Allen, K. Leslie

**Introduction:** Opioid abuse continues to be an endemic social and medical issue with significant morbidity and mortality. Our group has previously demonstrated significant reduction in opioid prescription following outpatient surgery without affecting patient-reported pain scores in the context of intensive patient and physician intervention.

**Hypothesis:** There will be a sustained opioid prescription practice one year post-intervention.

**Methods:** Patient-reported pain control as well as opioid prescription and use following elective outpatient open hernia repair or laparoscopic cholecystectomy was collected prospectively one year after the completion of a division-wide intervention (Post-I). The control group data was collected during the active intervention (Int) of the previous study, which included emphasis on co-analgesia with acetaminophen/NSAIDs, opioid reduced prescriptions, and patient education

**Results:** 192 patients were assessed in the intervention phase, with 128 patients assessed one year after the completion of the STOP study. There were no significant differences in the proportion of patients rating their pain control as good/ very good (84.7% Int vs 78.9% Post-I,  $p=0.23$ ) but mean postoperative pain scores were significantly greater one year after intervention (2.1 (SD 1.7) Int vs 4.1 (SD 1.0) Post-I,  $p<0.0-1$ ). Mean total oral morphine equivalents prescribed decreased after intervention (78 (SD 70) Int vs. 50 (SD 3) Post-I,  $p<0.001$ ). There was an increase in the proportion of prescriptions filled one year after intervention (44.8% Int vs 67.2% Post-I,  $p=0.03$ ).

**Conclusions:** Following opioid prescription reduction interventions, there is a sustained reduction of narcotics prescription and compliance with recommendations. There may have been a decrease in patient education and expectation management resulting in worsened post-operative pain scores. The majority of patients still describe good overall pain control.

## Presenter #7: Rachel Liu

Division: General Surgery

Node: Surgical Education Node

### **“Am I cut out for this?” - The Impostor Phenomenon Contributes to Burnout and Anxiety in Canadian Resident Physicians**

R. Liu, J. Davidson, T. Van Hooren, S. Jones, M. Ott

**Introduction:** “Impostor phenomenon” (IP) characterizes the feeling of extreme self-doubt despite consistently positive feedback. This study explored the relationships between IP, burnout, and anxiety in resident physicians in Family Medicine (FM), Paediatric Medicine (PM), Anesthesiology (AN), and General Surgery (GS) programs across Canada.

**Methods:** Anonymous surveys were emailed to 1,434 residents. The Clance Impostor Scale, Maslach Burnout Inventory-Human Services Survey (MBI-HSS), and General Anxiety Disorder-7 (GAD-7) scales were used to assess the prevalence of IP, burnout, and anxiety.

**Results:** 269 residents responded to the survey (FM=24.9%, PM=33.1%, AN=20.4%, GS=21.6%). IP was identified in 62.7% of all participants and the average score was 66.4 (sd=14.4), corresponding to ‘frequent feelings of impostorism’. Females were at higher risk for IP (RR=1.27, 1.03-1.57). Burnout was detected in 23.3% of respondents. FM and GS residents were more likely to be burned out than PM and AN residents (26.7%-31.7% vs. 10.0%,  $p=0.02$ ). Those who did not feel “well-supported” were 20-57% more likely to have IP ( $p<0.01$ ), 87-226% more likely to have burnout ( $p<0.01$ ), and 34-119% more likely to have anxiety ( $p=0.03$ ).

Scoring positive for IP was an independent risk factor for both burnout (RR=1.82, 1.07-3.08) and anxiety (RR=3.64, 1.96-6.76). Scoring positive for burnout, in turn, is an independent risk factor for anxiety (RR=2.65, 1.84-3.83). Increasing scores on the CIS is associated with increasing scores on both the MBI-HSS and GAD-7 ( $p<0.01$ ).

**Conclusion:** IP appears to be a universally prevalent phenomenon experienced by residents of all specialties surveyed and likely contributes to the development of both burnout and anxiety symptoms. These results highlight the weight educators must place on providing the necessary support to residents throughout their education, particularly in vulnerable groups, in order to alleviate threats to resident well-being.

## Presenter #8: Nick Mitrou

Division: General Surgery

Node: Fundamental Sciences & Surgical Innovation Node

### **Effectiveness of prophylactic inferior vena cava filters (IVCf) in adult trauma patients**

N. Mitrou, A. Makish, I. Ball, K. Vogt

**Background:** Pulmonary embolism (PE) is a devastating complication of hospital admission, and trauma patients are at particularly high risk. IVCf have been proposed as a prophylactic measure in this population of patients.

**Objective:** We conducted a systematic review and meta analysis of the literature to answer the question are prophylactic IVCf effective in preventing PE or mortality compared to routine DVT prophylaxis in adult patients admitted to hospital for trauma.

**Methods:** Pubmed, MEDLINE, EMBASE, and Cochrane CENTRAL were searched for all English language articles from the year 1990 until 2019. The search strategy was tested on a validation set of articles to confirm accuracy and inclusivity based on the search terms. The search terms were tailored to capture only studies in adult trauma patients with prophylactic IVCf and to exclude literature on chemoprophylaxis or in patients admitted to hospital for non-trauma diagnoses. When appropriate, data from these studies were pooled for meta-analysis. This was conducted using a random effects Mantel-Haenzsel model.

**Results:** Our search returned 1041 titles and abstracts. These were screened by two independent reviewers. Disagreements were resolved by consensus. 39 articles were evaluated for inclusion. Ten studies were included in the final analysis, two of which were randomized. Meta analysis demonstrated the RR for PE in patients with an IVC filter was 0.15 (95%CI 0.06-0.41,  $p = 0.0004$ ). RR for fatal PE was 0.13 (95%CI 0.03-0.51,  $p = 0.003$ ). RR for overall mortality and DVT were not statistically significant.

**Conclusion:** While there are variable individual results among the current studies, there was an overall associated reduction of the risk of PE and fatal PE in patients who received an IVC filter. The majority of studies are not randomized and have a high risk of bias. Furthermore there were multiple trials with zero events, decreasing the ability to estimate risk.

## Presenter #9: Nader Aboelnazar

Division: Cardiac Surgery

Node: Quality Improvement & Patient Centered Node

### **Does multi-arterial revascularization confer additional survival benefit in heart failure patients undergoing coronary artery bypass graft? A systematic review and meta-analysis.**

N. Aboelnazar, B. Gottschalk, E. Nagaoka, M. Klingel, and D. Nagpal

**Introduction:** Evidence has demonstrated that multi-arterial revascularization (MAR) may achieve additional durable long-term survival post-CABG compared to single arterial revascularization (SAR). Given the limited long-term survival of heart failure patients, the use of single versus multi-arterial revascularization in patients with reduced ejection fraction is debated.

**Hypothesis:** Patients with reduced left ventricular ejection fraction have improved survival expectations due to improved medical therapy. A multi-arterial revascularization strategy may confer additional survival benefit for these high-risk patients undergoing CABG.

**Methods:** We performed a systematic review, using multiple databases, to identify all studies (peer-reviewed, full text, in English, until August 2020) comparing the use of MAR versus SAR in patients with low left ventricular ejection fraction undergoing CABG. We excluded any with concomitant surgeries. Primary endpoint was mortality/survival, while secondary endpoints included short-term and long-term major adverse cardiovascular events (MACE). A meta-analysis is in progress.

**Results:** Eight papers met our criteria: all were retrospective and non-randomised. Variation existed in methodology, conduit analysis, outcomes, and duration of follow-ups. Two articles did not report propensity matching analysis. Preliminary analysis demonstrates no significant differences with regards to MACE; however, some studies reported a non-significant increasing trend in early mediastinitis with bilateral arterial thoracic revascularization. On the other hand, 7/8 studies reported that MAR confers a significant mid-to-late survival benefit regardless of the severity of left ventricular dysfunction. It was reported that MAR in these high risk patients is a strong independent predictor of survival (HR: 0.79; 95% CI: 0.66-0.94, p=0.007).

**Conclusion:** MAR may confer an extended survival benefit in high risk patients undergoing CABG.

## Presenter #10: Jeremy Cepek

Division: Urology

Node: Surgical Education Node

### **A Portable Endoscopic Simulator for Training in Urology**

J. Cepek, Y. Mu, C. Dawson, P. Wang

**Introduction:** Mastering a surgical skill requires experience and repetition, yet opportunities for surgical trainees to gain real experience is variable and limited by case load. Surgical simulators have emerged to attempt to overcome these limitations. In Urology, few commercially available simulators exist. One that has seen limited adoption, the URO Mentor, has been validated in several studies. However, this system is expensive, at \$60,000 USD, and is not portable. The goal of this work is to develop and validate a low-cost, portable endoscopic simulation system for training Urology residents.

**Hypothesis:** That a portable endoscopic simulation system will accurately mimic a real endoscopic environment.

**Methods:** We developed a system that simulates the experience of endoscopy in Urology. The system consists of a smartphone/tablet application (app) that displays an endoscopic camera view, and a wireless controller modelled like a real endoscope. The app is designed like a game, with sequential levels adding complexity to tasks that must be completed. The game has four levels: 1. Basic movements and surveillance, 2. Inspection of lesions, 3. Wire insertion into ureteric orifices, and 4. Laser lithotripsy. This initial study focuses on face validation of the prototype. Surveys were administered to three staff Urologists after trialing the system. The survey asked them to quantify how realistic each component of the system was felt to be.

**Results:** Subjective scores were obtained relating to the look, feel, and physics of the system; and a global score rating the system's perceived utility in increasing residents' performance in real life.

**Conclusion:** We created a portable endoscopic simulation system for training Urology residents. In this phase of our study, we obtained feedback that will inform the next iteration of the system. This validation is essential to the next phase, which will quantify the system's ability to improve resident performance in real life.

## Presenter #11: Farhad Ghasemi

Division: General Surgery

Node: Fundamental Sciences & Surgical Innovation Node

### **High Levels of Class I Major Histocompatibility Complex mRNA Are Present in Epstein–Barr Virus-Associated Gastric Adenocarcinomas**

F. Ghasemi, S.F. Gameiro, T.M. Tessier, A.H. Maciver, J.S. Mymryk

**Introduction:** Epstein–Barr virus (EBV) is responsible for approximately 9% of stomach adenocarcinomas. EBV-encoded microRNAs have been reported as reducing the function of the class I major histocompatibility complex (MHC-I) antigen presentation apparatus, which could allow infected cells to evade adaptive immune responses.

**Hypothesis:** Genetic expression of the MHC-I antigen presentation apparatus is reduced in EBV-associated gastric carcinomas compared to other subtypes of gastric carcinomas (GCs).

**Materials and Methods:** Using data from nearly 400 human gastric carcinomas (GCs) from The Cancer Genome Atlas (TCGA), we assessed the impact of EBV on MHC-I heavy and light chain mRNA levels, as well as multiple other components essential for antigen processing and presentation.

**Results:** Unexpectedly, mRNA levels of these genes were as high, or higher, in EBV-associated gastric carcinomas (EBVaGCs) compared to normal control tissues or other GC subtypes. This coordinated upregulation could have been a consequence of the higher intratumoral levels of interferon  $\gamma$  in EBVaGCs, which correlated with signatures of increased infiltration by T and natural killer (NK) cells.

**Conclusion/Discussion:** These results indicate that EBV-encoded products do not effectively reduce mRNA levels of the MHC-I antigen presentation apparatus in human GCs. The presence of non-self-derived viral antigens, combined with intact expression of the MHC-I antigen presentation complex and increased levels of infiltrating T cells, may contribute to the observation that patient outcomes are better for EBVaGCs versus other subtypes of GCs.

## Presenter #12: Silvio Ndoja

Division: Orthopaedic Surgery

Node: Surgical Education Node

### Testing improves long term learning of procedural skills

S. Ndoja, C. Dion, B. Charron, A. Ahmadi Pirshahid, A. McCarton, A. Durocher, ME. LeBel

**Introduction:** Tests are shown to enhance learning: this is known as the “testing effect”. The benefit of testing is theorized to be through “active retrieval”, which is the effortful process of recalling stored knowledge. This differs from “passive studying”, such as reading, which is a low effort process relying on recognition. The testing effect is commonly studied in random word list scenarios and is thought to disappear as complexity of material increases. The testing effect has not been studied in complex situations such as procedural learning.

**Hypothesis:** Testing enhances long-term retention of procedural skills.

**Method:** 48 participants watched an instructional video of an open reduction internal fixation of a Sawbones™ femur. Participants performed the procedure under guided supervision. After randomization, they either read the steps (passive studying group) or wrote down the steps from memory (active retrieval group) for 15 minutes. Following a washout period, all participants performed the procedure without guidance (immediate assessment) and then once more, one week after the initial testing (delayed assessment). The participants were assessed on how much they remembered, and their technical skills. Each performance was video-recorded for data analysis purposes.

**Results:** The passive group obtained a higher total OSAT score in the immediate phase ( $p < 0.05$ ). No difference at 1 week. Both groups experienced forgetting at 1 week compared to early test ( $p < 0.05$ ). The active retrieval group experienced less forgetting at 1 week compared to passive ( $p < 0.05$ ).

**Conclusion:** We demonstrated that active retrieval (through writing) insulated against forgetting at 1 week compared to reading. These interventions are not onerous on educators and can be easily incorporated into existing workflows. Future studies are needed to determine the effects of different kinds of active retrieval methods such as verbal retrieval (e.g. dictating) commonly seen in surgical practice.



## Presenter #13: Lyndsay Glass

Division: General Surgery

Node: Quality Improvement & Patient Centered Node

### **Safety of Venous Thromboembolism Prophylaxis in Endoscopic Retrograde Cholangiopancreatography: A Systematic Review**

L. Glass, H. Williamson, P. Murphy, E. Tang, K. Leslie, J. Hawel

**Introduction:** Endoscopic retrograde cholangiopancreatography (ERCP) is commonly performed to treat biliary and pancreatic diseases. Current guidelines suggest anticoagulation should be held prior to ERCP. The American Society of Gastroenterology has extended this to include Venous Thromboembolism (VTE) prophylaxis. We aimed to identify available literature regarding post-ERCP bleeding risk from VTE prophylaxis.

**Hypothesis:** Minimal evidence will be available to support this recommendation.

**Materials and Methods:** We searched MEDLINE and the Cochrane Central Register of Controlled Trials indexed from inception through February 13, 2020 for studies of adult patients where bleeding risk after ERCP was assessed. We scored studies on quality of reporting, internal and external validity, and study power; combined scores determined the overall quality.

**Results:** Our search identified 441 titles and 38 articles were reviewed in full. A total of 5 relevant titles were identified – one conference abstract, four primary articles. Only one result, a conference abstract, specifically addressed the risk of bleeding associated with VTE prophylaxis in inpatient ERCP. This study included 135 patients, 20 of which continued VTE prophylaxis. There was no statistically significant increased risk of bleeding for patient who remained on VTE prophylaxis. The 4 manuscripts evaluated the use UFH and LMWH in the prevention of post-ERCP pancreatitis – bleeding complications were variably reported as secondary outcomes in these papers, with variable results.

**Conclusion:** This systematic review demonstrates the lack of high-quality evidence regarding the periprocedural use of VTE prophylaxis. Despite this, the current recommendation is to suspend its use in the periprocedural period, potentially leaving acutely ill patients susceptible to VTE complications. Further high-quality studies are required to address this clinical question and to direct further recommendation.

## Presenter #14: Kathleen Nelligan

Division: Plastic Surgery

Node: Surgical Education Node

### **Understanding and enhancing surgical trainee exposure to the full spectrum of transgender health care**

K. Nelligan, E. Mitchell, A. Grant

**Introduction:** With increasing availability of gender confirmation surgery, more transgender individuals are seeking specialized health care. However, exposure to transgender educational content is limited for surgical trainees. Studies have been limited to quantitative assessments of educational content without considering if trainees find the curriculum adequate.

**Hypothesis:** This is a qualitative study examining surgical resident perceptions of existing curricula in trans health. Focus will be on assets and barriers to providing competent, patient-focused care to trans individuals.

**Materials and Methods:** Residents in the Departments of Obstetrics and Gynecology, Otolaryngology and Surgery were invited to participate. Participants completed a survey on exposure to trans health in medical education. Participants were invited to complete an optional semi-structured interview. Results of the survey were analyzed with descriptive statistics. Interviews were analyzed qualitatively using grounded theory methodology until saturation of themes occurred.

**Results:** 18 residents completed the survey of which 94 percent had provided care to a trans patient and 61 percent had been involved in gender confirmation surgery. Approximately two thirds had received teaching on trans health, for an average of only 3 hours. Preliminary analysis of interviews revealed that didactic teaching was limited and did not delve into clinical and social considerations for this marginalized group. Simulation sessions and clinical exposure focused on communication. Debriefing was helpful in developing open, non-judgmental verbal scripts for future clinical encounters. However, staff did not always take the opportunity to teach around cases.

**Conclusion:** Most residents have exposure to trans patients but teaching can be limited. Expansion could include increasing the number of teaching hours and using appropriate debriefing for simulations and clinical encounters to reinforce learning.

## Presenter #15: Eric Walser

Division: General Surgery

Node: Quality Improvement & Patient Centered Node

### **Standardization of opioid prescription after trauma (STOP- Trauma): A prospective intervention to reduce excessive opioid prescription.**

E. Walser, A. Makish, PB. Murphy, L. Allen, L. Hartford, D. Gray, C. Clarke, R. Hilsden, N. Parry, K. Leslie, KN Vogt

**Introduction:** Opioid abuse is one of the major contemporary issues in health care, and trauma patients are at high risk for post-injury opioid use disorders.

**Hypothesis:** The introduction of a standardized pain management pathway would be associated with 1) at least equivalent pain control and 2) a reduction in opioid prescription amongst patients admitted to a Canadian Level I trauma centre.

**Methods:** This was a prospective trial from Jan 2019- Feb 2020, with introduction of a standardized pain management pathway in Sept 2019. Trauma patients admitted for >24 hours and discharged to home were eligible. Those with an ICU stay >14 days, age >85 years, or those using opioids at admission were excluded. The intervention included: 1) provider education; 2) multi- modal analgesia; 3) patient/ family education. Recommendations were for rational prescribing based on inpatient opioid use, but discharge prescriptions were at clinician discretion. Patients completed a modified Brief Pain Inventory at their first trauma clinic visit. The primary outcome was patient-reported pain on a 10-point scale, compared using the two- sample t-test for non-inferiority (NI).

**Results:** A total of 147 patients were included; 100 pre- intervention (Pre-I) and 47 post- intervention (Post-I). The mean pain scores were 4.7 (SD 2.3) Pre-I and 4.3 (SD 2.6) Post-I (mean difference -0.4, 97.5% CI -1.4 to 0.5,  $p < 0.001$  for NI,  $p = 0.34$  for superiority). The median discharge prescription was reduced after intervention (72 [0-144] Pre-I vs 0 [0-144] Post-I,  $p = 0.013$ ), corresponding to a 38% reduction in prescription. There were no differences in the proportion of patients requiring an additional prescription after discharge (22% Pre-I vs 19% Post-I,  $p = 0.67$ ).

**Conclusion:** A standardized multimodal pain pathway was NI with respect to post-discharge pain and significantly reduced opioid prescription following trauma. We believe similar protocols will have a significant impact on the opioid crisis.

## Presenter #16: Evelyn Waugh

Division: General Surgery

Node: Quality Improvement & Patient Centered Node

### **Neoadjuvant chemotherapy vs. upfront surgery for borderline resectable pancreatic cancer: a single-centre cohort analysis**

E. Waugh, D. Breadner, R. Liu, E. Tang, L. Allen, S. Welch, K. Leslie, A. Skaro

**Background:** Patients with borderline resectable pancreatic ductal adenocarcinoma (PDAC) are a proposed target population for neoadjuvant chemotherapy (NAC) with the goal of downstaging disease for surgical resection, however, there is a lack of consensus regarding the benefit of NAC. This study examines the effects of NAC in patients with borderline resectable PDAC in comparison to those who underwent upfront pancreaticoduodenectomy.

**Methods:** Patients were identified from a retrospectively collected database between 2007 and 2017 and prospectively from 2018-2020. Borderline resectable tumours were defined by AHPBA criteria and/or a CA19-9 value >100. The primary outcome was overall survival (OS) at 1 and 3 years. Secondary outcomes included R0 resection, recurrence and nodal involvement. Statistical analysis included parametric, non-parametric tests and Cox Proportional Hazard regression.

**Results:** 40 patients who underwent NAC and 45 with upfront surgery were identified. Groups had comparable mean age (65.7 vs. 64.7), gender and preoperative comorbidities. Median pre-treatment CA19-9 corrected for bilirubin was lower in the NAC group (12.5 vs. 125,  $p = 0.05$ ). 70% (28) of patients undergoing NAC became resectable. Of patients undergoing surgery, 85.7% (24) of the NAC and 62% (28) of the upfront surgery group were resectable. Intention to treat analysis showed 1 year OS was 58% (25) in the NAC group and 40% (18) in the upfront surgery group ( $p = 0.04$ ). 3 year OS was 43% (17) in the NAC and 9% (4) in the upfront surgery group ( $p < 0.001$ ). Median survival was 10 months across groups. Median time to recurrence was similar (276.5 vs. 260.5 days). The NAC group had a lower rate of positive margins (8.3% vs. 32.1%  $p = 0.04$ ) and lymph node metastasis (44% vs. 66%,  $p = 0.1$ ).

**Conclusions:** This supports an OS benefit for patients with borderline resectable PDAC who undergo NAC with statistically significant greater OS at 1 year and 3 years and improved surgical outcomes.

## **DEPARTMENT OF SURGERY NODE PRESENTATIONS & DRAGON'S DEN PITCHES**

Node Productivity: Dr. Kelly Vogt

**FUNDAMENTAL SCIENCES & SURGICAL INNOVATION NODE SPEAKER: Dr. Gregor Reid**

Talk Title: How to Get from Surgeon to Innovator

**SURGICAL EDUCATION NODE SPEAKER: Dr. Aaron Grant**

Talk Title: Variability in Intraoperative Teaching Approaches Among Excellent Surgical Educators

**FACUTLY DRAGON'S DEN PITCHES:**

**Pitch #1 – Dr. Ahmad Elnahas-** “The Impact of Private Endoscopy Clinics on Public Delivery of Colonoscopies in Ontario “ (ICES Node)

**Pitch #2 – Dr. Andreana Butter –** “Consent: the Use of Animated Videos as Adjuncts for Pediatric Surgeries” (Quality Improvement & Patient Centered Node)

**Pitch #3 – Dr. Marie-Eve LeBel-** “How to Improve Learning of Procedural Skills” (Surgical Education Node)

**ICES NODE SPEAKER: Dr. Ahmad Elnahas**

Talk Title: Access to Surgery among Older Patients Referred to the Ontario Bariatric Network

**QUALITY IMPROVEMENT & PATIENT CENTERED NODE SPEAKER: Dr. Ryan Degen**

Talk Title: Hip Arthroscopy Utilization and Survivorship in Ontario: A Population-Based Analysis Comparing Different Aged Cohorts

**FACULTY DRAGON'S DEN PITCHES:**

**Pitch #1 – Dr. Parham Rasoulinejad –** “A novel 3d-printed design of the spine” (Surgical Education Node)

**Pitch #2 – Dr. Brad Moffat-** “I’m too frail for this – The prevalence and consequences of perioperative frailty” (Quality Improvement & Patient Centered Node)

**Pitch #3- Dr. Jennifer Bjazevic –** “What’s Old is New Again: Revitalizing Traditional Treatments for Urinary Stone Disease” (Fundamental Sciences & Surgical Innovation Node)

## RESIDENT DRAGON’S DEN PITCHES

**Pitch #1 – Dr. Kitty Wu-** “Trapezius function after spinal accessory to suprascapular nerve transfer”

**Pitch #2- Dr. Silvio Ndoja –** “Characterizing the landscape of surgeons’ practice patterns through their careers over the last 30 years”

**Pitch #3 – Dr. Kristen Barton –** “Joint Management: An Online Resource for Individuals with Mild to Moderate Hip and Knee Osteoarthritis (OA)”

**Pitch #4- Dr. Farhad Ghasemi –** “Impact of Epstein-Barr Virus (EBV) status on the immune landscape of gastric adenocarcinoma”

**Pitch #5 – Dr. Nicole Schneider –** “Biomechanical Comparison of C1-C2 Fixation Constructs for Type II Odontoid Fractures”

**Pitch #6 – Dr. Jeremy Cepek-** “Surgeons-Eye View: Development of an Eye-Tracking System to Enhance Surgical Education”