

PP01

Harvesting the ‘SEAD’: Long-term follow-up of the Surgical Exploration and Discovery Program

Linden K. Head, Brittany Greene, Nada Gawad, Stanley J. Hamstra, Tim Brandys

Division of Plastic Surgery

Domain: Education Research

INTRODUCTION: The Surgical Exploration and Discovery (SEAD) program was established to encourage acquisition of surgical knowledge and to facilitate career decision making by providing preclerkship students with comprehensive exposure to surgical specialties. Our short-term findings demonstrated that, compared to a control group, SEAD participants showed significantly greater career-related learning. The purpose of this study was to understand the impact of SEAD on students’ final residency selections. **METHODS:** This was a prospective cohort study. One group of students participated in a two-week surgical curriculum (SEAD group, n=18) while another group read only the program manual (Manual group, n=18). Students were surveyed following their residency selection 3 years later. Primary outcome measure was students’ final specialty preference: medical or surgical. Secondary outcome measures were perceived program utility and satisfaction. **RESULTS:** Survey response rate was 100%. There was no significant difference in the number of students who pursued surgical careers in the SEAD and Manual groups. All students who pursued a surgical residency were ‘very interested’ in surgery prior to SEAD – initial interest in surgery had a significant influence on final residency preference. The vast majority of participants indicated SEAD was valuable in facilitating career decision making but that it was less important than mentorship and clinical experiences. **CONCLUSIONS:** Although SEAD does not generate sustained new interest in surgical disciplines, it is a valuable experience that facilitates career decision making for medical students. Integration of a formalized mentorship component could serve as a potential lever to increase interest in surgical specialties.

Presenter: Dr. Linden K. Head

Presenter Contribution: Involved from project conception to manuscript preparation, including idea conception, ethics submission, methodology execution, data collection, data analysis, and manuscript preparation.

PP02

Association of intraoperative hypotension and renal replacement therapy after cardiac surgery

Janet Ngu, Amy Chung, Michael Bourke, Louise Sun

Division of Cardiac Surgery

Domain: Clinical Research

INTRODUCTION: Acute kidney injury (AKI) is a common and serious complication of cardiac surgery. AKI severe enough to necessitate renal replacement therapy (RRT) is independently associated with mortality. This study sought to investigate if there is a relationship between intraoperative hypotension and postoperative RRT. **METHODS:** After institutional REB approval, we conducted a retrospective cohort study of consecutive patients who underwent cardiac surgery requiring cardiopulmonary bypass (CPB) from November 1, 2009 – March 31, 2015. Excluded were those who were dialysis dependent or underwent off-pump procedures. The primary outcome was postoperative RRT. Primary exposures were the durations of MAP < 65 mmHg pre-, during and post-CPB, in minutes. All intraoperative invasive MAP measurements were recorded every 15 secs in an electronic patient record. The relationship between hypotension and RRT was modeled using multivariable logistic regression with adjustment for a priori selected risk factors. **RESULTS:** A total of 7537 patients were included in the study, of whom 558 (7.4%) required postoperative RRT. Every 10 additional minutes of MAP < 65 mmHg post-CPB was associated with an 8% increased odds of RRT (adjusted OR 1.08, 95% CI 1.05-1.12). MAP < 65 mmHg pre- and during CPB were not associated with RRT. Other independent RRT risk factors were heart failure, peripheral vascular disease, preoperative creatinine clearance < 60 ml/min, obesity, anemia, emergent surgery, preoperative cardiogenic shock, redo operations, combined CABG and valve procedures, transfusion of ≥ 4 units of packed red cells, new onset atrial fibrillation and need to reopen postoperatively. **CONCLUSIONS:** Post-CPB MAP < 65 mmHg was an independent and potentially modifiable RRT risk factor. Other potentially modifiable RRT risk factors were anemia and new onset postoperative atrial fibrillation. Strategies to mitigate RRT may confer important benefits. This study provides an impetus for clinical trials to determine if specific interventions that facilitate prevention and prompt treatment of these modifiable risk factors could also mitigate the risk of RRT.

Presenter: Dr. Janet Ngu

Presenter Contribution: Data organization, data analysis, drafting of abstract and manuscript.

PP03

Native Coronary Disease Progression Post Coronary Artery Bypass Grafting

Jabagi H, Chong AY, So D, Glineur D, Rubens FD

Division of Cardiac Surgery

Domain: Clinical Research

Introduction: Arterial grafts have intrinsic endothelial properties which may influence atherosclerosis. It remains unclear as to whether graft choice impacts disease progression in native coronary arteries after CABG. **Methods:** Patients who underwent repeat cardiac catheterization at least 6 months post CABG with at least one or more arterial grafts were included. Pre and post CABG angiograms were examined by 2 experienced readers. Each coronary segment was viewed in at least 2 projections. Progression was defined as new stenosis of $\geq 50\%$ in a previously normal coronary, an increase in previous stenosis of $\geq 20\%$, or a new occlusion. The primary outcome was the occurrence of native upstream disease progression in bypassed vessels. Secondary outcomes included complete occlusion and left main (LM) progression. Cox proportional hazard regression models were used for time-to-event outcomes. **Results:** The final study population included 98 patients comprising 263 grafts (143 arterial grafts, 120 venous grafts). The median time from date of surgery to date of catheterization was 559 days (IQR 374, 910). Ninety-one targets showed disease progression (34.6%) with 75 vessels progressing to complete occlusion (28.5%). Peripheral vascular disease was the only significant factor associated with LM disease progression (HR 5.44 (1.92, 15.46), $p=0.001$), but progression was not dependent on the graft choice ($p=0.754$). Non-LM progression was also not associated with graft choice (HR 0.74 (0.49, 1.13) $p=0.163$), but there was a significant association with age ($p=0.034$), previous PCI ($p=0.002$), ACE inhibitor (ACEI) use ($p<0.001$), CAD severity ($p<0.001$), CCS class 3/4 ($p=0.016$) and NYHA class 3/4 ($p<0.001$). Factors associated with complete occlusion included previous PCI ($p=0.007$), ACEI use ($p<0.001$), and use of SVG ($p=0.019$). **Conclusions:** Native disease progression post CABG is a common occurrence, with most involved vessels demonstrating complete occlusion on followup. Disease progression in non-LM coronary arteries was multifactorial, whereas LM disease progression was only associated with PVD. Vein graft use was associated with proximal progression to complete occlusion.

Presenter: Dr. Habib Jabagi

Presenter Contribution: Data collection, statistical analysis, study design, coronary angiogram analysis, manuscript author

PP04

Spino-pelvic hypermobility is associated with inferior clinical outcomes post-THA: A dynamic assessment of patients with and without spinal arthrodesis

George Grammatopoulos, Wade Gofton, Matthew J. Coyle, Johanna Dobransky, Cheryl Kreviazuk, Paul Kim, Zaid Jibri, Paul E. Beaulé

Division of Orthopaedic Surgery

Domain: Clinical Research

Introduction: Spinal arthrodesis (SA) may interfere with sagittal dynamics influencing THA biomechanics. This study aims to a) Determine how outcome post-THA compares between patients with- and without-SA, b) Characterize sagittal pelvic changes that occur when moving between supine, standing, and sitting positions, and test for differences between patients with- and without-SA, and c) Assess whether changes in sagittal pelvic position are associated with outcome post-THA. **Methods:** Forty-two patients with THA-SA (60 hips) were case-control matched for age, gender, BMI with 42 THA-only patients (60 hips). All presented for review where outcome, PROMs [including Oxford-Hip-Score(OHS)] and 4 radiographs of the pelvis and spino-pelvic complex in 3 positions (supine, standing, deep-seated) were obtained. Cup orientation and various spino-pelvic parameters [including pelvic tilt (PT) and Pelvic-Femoral-Angle (PFA)] were measured. The difference in PT between standing and seated allowed us to classify patients based on spino-pelvic mobility into normal ($\pm 10-30^\circ$), stiff ($\pm 30^\circ$). **Results:** THA-SA group had inferior PROMs (OHS: 33Vs.43) and complications (12Vs.3), especially dislocation (5Vs.0) than the THA-only group. No difference in change of PT between supine and standing positions was detected between groups. When standing THA-SA patients had greater PT (24° Vs. 17°) and the hip was more extended (194° Vs. 185°). THA-SA patients were 4x more likely to have spino-pelvic hypermobility, anteriorly tilting their pelvis. Spino-pelvic hypermobility was associated with inferior PROMs (OHS:35) and was present in dislocating hips that required revision despite optimum cup orientation. **Conclusion:** SA is associated with inferior outcome post-THA. Patients with THA-SA are more prone to posterior impingement when standing (greater tilt and PFA), and are more prone to spino-pelvic hypermobility risking anterior impingement when deep seated (anterior tilt functionally retroverting cup). This leads to a very narrow impingement-free safe zone. As spino-pelvic mobility is also associated with inferior PROMs, it should be routinely assessed.

Presenter: Dr. Matthew Coyle

Presenter Contribution: I was involved with patient recruitment, patient evaluation, radiographic analysis and manuscript preparation.

PP05

Noninvasive glioma biomarkers via resting-state functional MRI: modeling the dynamic interplay between the tumour and brain plasticity

Diana C. Ghinda, Stefano Damiani, Niall Duncan, Shankar Tumati, Jiansong Wu, Georg Northoff

Division of Neurosurgery

Domain: Clinical Research

Introduction: Management of glial tumors involves neurosurgical resection and adjuvant treatment aiming a maximal neurosurgical resection of tumoral tissue while preserving functionally relevant eloquent regions. Therefore, biomarkers that can reliably distinguish infiltrated non-functional tissue are needed. **Methods:** After local ethics board approval was received at Huashan Hospital (Shanghai, CH), 61 patients with pathological confirmed low and high-grade glioma underwent pre-operative structural and resting-state functional MRI. Standard preprocessing was performed followed by calculation of four parameters: the mean EPI signal intensity, regional homogeneity (ReHo), standard deviation (SD) and power law exponent (PLE). A 1 cm diameter sphere was selected inside the tumor region (as delineated in anatomical images) and a contralateral mirror region of interest (ROI) was computed. **Results:** The four parameters displayed a significant difference between the tumoral tissue and the contralateral macroscopically non-infiltrated tissue: PLE ($p=0.002$), SD ($p<0.0001$), ReHo ($p<0.0001$) and mean of the EPI data ($p<0.0001$). A gradient of the voxel-based results was subsequently computed using the SOBEL edge detection algorithm and the difference between the two ROIs was compared. Of the four values, the mean EPI showed the most significant difference between the tumor and the healthy region ($p<0.0001$). **Conclusion:** Noninvasive biomarkers identified by rs-fMRI could provide a novel approach to assess the peritumoral tissue where the likelihood of residual infiltrating tumoral cells and functional tissue is the highest. Future research may allow to model the dynamic interplay between the tumour, brain network plasticity and surgical intervention in order to tailor the extent of resection in order to improve the survival and quality of life of the patients.

Presenter: Dr. Diana C. Ghinda

Presenter Contribution: Project implementation; data collection, analysis and interpretation

PP06

Exclusion criteria and adverse events in peri-operative trials of tranexamic acid: A systematic review and meta-analysis

Jeffrey Yates, Iris Perelman, Elianna Saidenberg, Simonne Khair, Josh Taylor, Jacinthe Lampron, Alan Tinmouth

Division of General Surgery

Domain: Clinical Research

Introduction: Tranexamic acid (TXA) has been shown to be effective at minimizing blood loss and the need for transfusion during surgery while being safe and inexpensive. Despite this, it remains under-utilized, mainly due to safety concerns. There is also a lack of evidence-based guidelines regarding which patients should not receive TXA due to the risk of harm outweighing potential benefits. We conducted a systematic review and meta-analysis to determine for which patients safety information on TXA is lacking due to common exclusion from peri-operative TXA trials. **Methods:** We searched the databases Medline, EMBASE, CENTRAL, and Clinicaltrials.gov from inception until September 2017. Eligible studies were RCTs administering systemic TXA peri-operatively to any elective or emergent surgery patients. Our primary outcome was the exclusion criteria of the RCTs, and as a secondary outcome we assessed risk of adverse events from TXA use. A descriptive synthesis of study characteristics and exclusion criteria was performed. **Results:** The safety of TXA was assessed through meta-analysis. 270 eligible RCTs were included in this systematic review. We found that patient groups commonly excluded from peri-operative TXA trials were those with major comorbidities, a history of thromboembolic events, taking medication affecting coagulation, allergic to TXA, and those with coagulopathy. Some of these exclusions may not be warranted based on current evidence, but due to being excluded from RCTs, there may be limited efficacy and safety data on TXA in these patient populations. Meta-analysis showed that peri-operative systemic TXA was not associated with an increased risk of adverse events compared to placebo or no intervention (RR = 1.05, 95% CI: 0.99, 1.12). **Conclusion:** In conclusion, systemic TXA is safe to use peri-operatively, and evidence-based guidelines for its use in surgery can be developed for many patient populations.

Presenter: Dr. Jeffrey Yates

Presenter Contribution: Helped with concept design, inclusion/exclusion criteria, literature search, data extraction, chart formation, editing.

PP07

Impact of direct access to cardiac surgical services on the time to repair in acute type A aortic dissection

Ming Hao Guo, Robert Ohle, Guy Hebert, Fraser Rubens

Division of Cardiac Surgery

Domain: Quality Improvement Research

Introduction: Acute type A aortic dissection (TAAD) is a surgical emergency, yet its diagnosis is often delayed due to symptom variation, limited imaging access, and absence of cardiac surgical expertise. We hypothesize that system differences at the Emergency Department (ED) may have an impact on the time to definitive therapy. **Methods:** A retrospective review was done in patients who underwent TAAD repair; ED and peri-operative data was collected. Patient outcomes were analyzed based on site of presentation (peripheral hospital or tertiary care with or without direct access to cardiac surgery). The primary outcomes were times of initial assessment to definitive testing and to surgical consult. **Results:** EDs are categorized into The Ottawa Civic Hospital (TOH-C), The Ottawa General Hospital (TOH-G), and referring peripheral hospital (RPH). ED physicians affiliated with University of Ottawa work at both TOH-C and TOH-G, but not at RPH. In addition, TOH-C has a dedicated Computer Tomography (CT) facility for the ED, whereas TOH-G and RPH do not. From December 2009 to June 2016, 108 patients underwent emergency TAAD repair, of which 18 patients presented to TOH-C, 17 patients to TOH-G, and 73 patients to a RPH. The mean age was 63.5 years old. There was a trend for patients who presented to TOH-C to more likely be in shock, with 38.5% of patients unstable on arrival, compare to 0% at TOH-G and 18.9% at RPH ($p = 0.07$). There was a significant difference between median time of physician assessment to definitive diagnostic testing between TOH-C (86 minutes; IQR 50, 216) and TOH-G (240 minutes; IQR 113, 375) ($p = 0.03$). The median time from ED physician assessment to time of cardiac surgery consultation was also significantly shorter at TOH-C (104 minutes; IQR 70, 235) compare to that of TOH-G (350 minutes; IQR 145, 600) and RPH (209 minutes; IQR 115, 389) ($p < 0.01$). There was no difference in the frequency of each type of diagnostic test used or in-hospital mortality. **Conclusion:** Proximity to cardiac surgical services and access to a dedicated ED CT facility resulted in shorter times to definitive diagnosis and surgery consultation after presentation for TAAD.

Presenter: Dr. Ming Hao Guo

Presenter Contribution: Retrospective chart review, data collection, and write up

PPo8

Quality improvement in timing and delivery of carotid endarterectomies (CEAs) at The Ottawa Hospital: is the pendulum swinging too far?

Shira Strauss, Anika Mohan, Elham Sabri, Tim Brandys, George Hajjar, Andrew Hill, Dalibor Kubelik, Sudhir Nagpal, Prasad Jetty

Division of Vascular Surgery

Domain: Quality Improvement Research

Introduction: A prior study at The Ottawa Hospital (TOH) showed CEAs were outside the recommended 2-weeks from symptom onset, prompting quality improvement initiatives to reduce waits. While guidelines recommend urgent CEA following symptoms, recent evidence suggests that perioperative stroke risk may be higher in the hyper-acute setting. Our study objective was to identify factors, like timing, that lead to poor CEA outcomes. **Methods:** The cohort included all patients who underwent CEA by TOH vascular surgeons between 2003-2017. Clinical data were obtained from electronic medical records and office charts, and ultrasound surveillance data from TOH's Vascubase. Patient demographics, perioperative data, CEA timing, operative technique, and post-op complications were recorded. Statistical analyses were performed using Fisher's exact test and stratified by various variables. **Results:** 1027 CEAs in 978 patients were performed during the study period, including 76.8% (n=789) for symptomatic carotid stenosis. The majority (94.9%) demonstrated preoperative ipsilateral stenosis 70-99%. Overall 30-day stroke, stroke/death, and stroke/death/MI rates were 2.1%, 2.4%, and 2.6%. Hyperperfusion syndrome and nerve injury rates were 4.1% and 5.6%. Among symptomatic patients, CEA was performed in <2 days in 10.0% (n=79), 2-14 days in 32.9%, and >14 days in 57.1%. There was a non-significant trend towards higher stroke rate in patients undergoing CEA within 2 days of symptoms (3.8% <2 days, 1.9% for 2-14 days, 2.2% >14 days, p=0.32). CEA <2 days was associated with the highest rate of ICH (2.5%, p=0.05) and MI (2.5%, p=.05). Eversion CEA was the surgical technique associated with the highest rate of >80% ipsilateral carotid restenosis (17.9%), p=0.02. Anesthetic, stenosis severity, and shunt use were not associated with adverse outcomes. **Conclusions:** Despite improvement in delivery of CEA for stroke prevention following symptom onset, there is an association between hyperacute CEA (<48 hrs) and worse outcomes. Further investigation should determine whether this represents a higher risk population who will benefit from expedient surgery or whether a "cool-down" period is warranted.

Presenter: Dr. Shira Strauss

Presenter Contribution: I was involved with project-planning, data collection, meeting with the statistician, and abstract-writing

PP09

Prolonged versus Brief Balloon Inflation for Arterial Angioplasty

Mark Rockley, Vignan Yogendrakumar, Katie Rockley, Prasad Jetty, Dean Fergusson

Division of Vascular Surgery

Domain: Clinical Research

Introduction: Our study investigated whether prolonged inflation of at least one minute duration, when compared with brief inflation, affects residual stenosis after arterial angioplasty. **Methods:** In compliance with PRISMA, two independent reviewers searched EMBASE, MEDLINE, CENTRAL, and secondary sources. Data abstraction and analysis was performed independently, according to pre-specified criteria. The primary outcome was residual stenosis after angioplasty. Protocol registered on PROSPERO (92702). **Results:** Six relevant articles were identified, of which five investigated coronary vessels and one investigated peripheral vessels, encompassing 1496 procedures. The studies were at moderate risk of bias, and displayed features of publication bias. Minimal heterogeneity allowed for meta-analysis. Prolonged balloon inflation was significantly associated with lower risk of residual stenosis post-inflation (RR 1.78 [1.49-2.14]) in addition to approximately half of the risk of arterial dissection and need for adjunctive procedures such as stenting. Following adjunctive procedures, less residual stenosis was still observed in the prolonged angioplasty group. Follow-up revealed a significant reduction in overall severity of stenosis, which was only apparent in the pooled mean difference. There was no significant difference in the binary incidence of long-term restenosis. Clinically apparent end-organ ischemia, such as chest pain during coronary balloon inflation, was twenty times more common during prolonged angioplasty. Sensitivity analysis accounting for the effect of vascular location or study design did not reveal significant differences. **Conclusions:** Prolonged angioplasty significantly improves immediate radiographic results, however the long-term effect is less pronounced. This is the first systematic review supporting prolonged angioplasty, particularly when stent placement is contraindicated. Because peripheral angioplasty is not limited by symptomatic organ ischemia to the same degree as coronary interventions, further prolongation of angioplasty inflation duration in peripheral arteries may extend these benefits, warranting a clinical trial.

Presenter: Dr. Mark Rockley

Presenter Contribution: I conceived the question, developed the protocol, executed the search and data abstraction with the help of co-authors, performed analysis, and formulated the abstract.

PP10

Predictors of in-hospital mortality among surgical patients requiring rapid response team activation: Identifying opportunities for earlier transfer to higher acuity units

Alexandre Tran, Shannon M. Fernando, Daniel I. McIsaac, Bram Rochweg, Andrew J. E. Seely, Dalibor Kubelik, Peter M. Reardon, Jennifer Shen, Peter Tanuseputro, Kwadwo Kyeremanteng

Division of General Surgery

Domain: Quality Improvement Research

Introduction: Rapid response teams (RRT) are intended to provide supportive care and mitigate adverse events in acutely deteriorating hospital ward patients. We sought to describe the mortality risk and its associated predictors for surgical patients requiring RRT activation. **Methods:** We performed a secondary analysis of a prospectively collected registry within a single hospital system (two campuses) between May 2012 and May 2016. Surgical patients were those admitted to a surgical ward with a surgical diagnosis identified by ICD-10 coding. Independent risk factors including patient age, medical comorbidity, admitting service, reason for RRT activation, code status, number of prior hospitalizations and ICU admissions for in-hospital mortality were analyzed using a multivariable logistic regression analysis. **Results:** We analyzed 2212 RRT activations on discrete surgical patients. Included patients were most commonly admitted to General Surgery (27.3%), Orthopedics (20.7%), Vascular Surgery (11.4%), Neurosurgery (10.7%) and Thoracics (8.3%). Common reasons for activation included heart rate or rhythm abnormalities (21.4%), respiratory distress (19.3%) and altered level of consciousness (16.5%). Approximately 1 in 4 (22.6%) patients required ICU admission and 1 in 5 (19.3%) died while in hospital. After adjusting for confounding, we identified the following RRT-related predictors of in-hospital mortality: longer RRT call duration per 15 minutes (adjusted OR 1.05, 95% CI 1.01 to 1.10) and increased number of RRT activations (adjusted OR 1.54, 95% CI 1.32 to 1.79). Time elapsed between onset of reason for and initiations of RRT activation as well as RRT response time following activation were not significant predictors. The c-statistic for the model was 0.81. **Conclusion:** RRT activation in surgical patients identifies a high risk (20%) of mortality. Increasing frequency and duration of RRT activation are associated with worsening risk of in-hospital mortality. This work identifies potentially actionable risk factors, highlighting a vulnerable population that may benefit from earlier transfer to a higher level acuity of care.

Presenter: Dr. Alexandre Tran

Presenter Contribution: Study conception Methodology design Data analysis Manuscript creation

PP11

Surgical Exploration and Discovery (SEAD) Program: Early exposure to surgical subspecialties and its influence on student perceptions of a surgical career.

Katie E. Hicks, Maria Doubova, Remington M. Winter, Christine Seabrook, Tim Brandys

Division of Other (please specify)

Domain: Education Research

INTRODUCTION: Interest in pursuing a surgical career has been declining amongst Canadian medical students. Numerous factors are known to influence student interest in pursuing surgery, such as prestige, income potential, and overall lifestyle. Given that many of these factors are rooted in bias, it may be possible to properly address several of these stereotypes among medical students through first-hand, early exposure to the field of surgery via the Surgical Exploration and Discovery (SEAD) Program. The objectives of this study were twofold: (1) to investigate whether participation in the SEAD program can alter student opinion of a career in surgery, and (2) to determine whether these changes in perception, if present, have an overall bearing on student interest in pursuing a surgical career. **METHODS:** The analysis cohort consisted of 59 first-year medical students – 30 who participated in the SEAD program, and 29 who did not. Both the SEAD and Control groups completed two surveys: 1) an entry survey distributed prior to the start of SEAD, and 2) an exit survey distributed upon completion of the program. The surveys assessed general motivations for choosing a specialty in medicine, previous surgical experience, as well as perceptions surrounding a surgical career. **RESULTS:** Student perceptions of the lifestyle, call schedule, diversity of practice, and gender balance of several surgical subspecialties changed significantly following the SEAD program compared to controls ($p < 0.05$). Furthermore, student perceptions of surgeons as intimidating declined following SEAD ($p = 0.003$); however, they were more likely to view surgery as a field requiring physical strength ($p = 0.022$). Overall, there was no significant change in desire to pursue a surgical career in the treatment ($p = 0.727$) or control ($p = 1.00$) groups. However, compared to controls, a greater proportion of SEAD participants developed a new interest (17% vs. 0%, $p = 0.0289$) and ruled out a prior interest (10% vs. 4%, $p = 0.391$) in surgery. **CONCLUSIONS:** Early exposure to surgery through the SEAD program is capable of altering student perceptions of surgical specialties, as well as assisting with career decision making.

Presenter: Katie Hicks

Presenter Contribution: I was one of three co-directors of the Surgery Interest Group at the University of Ottawa, who ran the SEAD Program in 2017. I was involved throughout the entire research process, including but not limited to formulating the initial research question, generating the student questionnaires, obtaining REB approval, data collection, analysis, and interpretation, as well as manuscript preparation.

PP13

Resident-run urology clinics: a potential tool for use in competency-based medical education for teaching and assessing transition-to-practice skills

Luke Witherspoon, Shreya Jalali, Matthew Roberts

Division of Urology

Domain: Education Research

Introduction: In a competency-based approach to resident education, a component of training should focus on skills needed for the transition from residency to independent practice. The ability to run an outpatient clinic represents one such skill. Resident-run clinics (RRCs) have been implemented in Family Medicine programs to allow residents to practice this skill, and have enhanced learning while providing excellent patient satisfaction¹⁻⁵. To date there has been little experience with RRCs in surgical residency programs. We describe a Urology RRC and report assessments of both resident performance and patient satisfaction. **Methods:** The RRC is attended and run independently by a senior resident. All cases were reviewed with faculty at the end of the day, and an evaluation form assessing resident performance was completed. Residents completed a brief self-assessment. All patients completed an anonymous survey to assess aspects of patient satisfaction. **Results:** Overall resident performance was excellent, with changes to the management plan in 6% (2/32) of cases after faculty review. All clinics finished within 30 minutes of planned end time. Residents reported confidence in their ability to manage the clinic (8.25/10). 18 patient surveys were completed. On a 5-point scale, patient ratings of wait time, clinic environment, and appointment duration were 3.94, 4.41, and 4.24 respectively. Patient ratings of residents' skills (communication, sensitivity, treatment options, and answering questions) were 4.28, 4.18, 4.24, and 4.41 respectively. Overall confidence in residents was 8.83/10 (SD 1.69) and 100% of patients would recommend the RRC. **Conclusions:** Based on our ongoing experience, RRCs provide well-received, safe patient care and serve as a learning tool for residents as they prepare for independent practice. Given these results, residency programs could consider inclusion of a RRC as a component of the transition-to-practice training within a competency-based curriculum.

Presenter: Dr. Luke Witherspoon (Submitted by Shreya Jalali)

Presenter Contribution: REB application, Data Analysis, results interpretation

PP14

Outcomes of intestinal ischemia among patients undergoing cardiac surgery

James Holden, Robert Ian Grant, Ahmed Warraich, Lukas Hashem, Diem Tran, Fraser Rubens, Husein Mooloo, Isabelle Raiche, Reilly Musselman, Lara Williams

Division of General Surgery

Domain: Clinical Research

Introduction: Intestinal ischemia is a rare but devastating complication associated with cardiac surgery. The aim of this study was to describe the long-term outcomes among patients who develop bowel ischemia after a cardiac procedure, in order to better guide surgical decision-making and discussions with patients and their families. **Methods:** Retrospective data over a ten year period from 2005 to 2015 was extracted from the Cardiac Anesthesia Perioperative Database at the University of Ottawa Heart Institute, with supplementation from The Ottawa Hospital's records. Patients with a diagnosis of intestinal ischemia after elective or emergent cardiac surgery were identified. Patients who underwent surgical intervention for management of their intestinal ischemia were compared to patients who did not with respect to the following variables: In-hospital mortality, length of stay, and disposition at discharge. **Results:** Of the 15086 patients who underwent cardiac surgery during the study period, 54 cases of intestinal ischemia were identified, which represents an incidence of 0.36%. In-hospital mortality among these patients was 70%. Surgical intervention was undertaken in 24 patients and mortality in this group was 54%, compared with a mortality rate of 83% in those who did not have surgery. Among patients who had surgery, the rate of stoma creation was 50%. The mean length of stay in hospital was 84 days after the initial cardiac surgery for patients who survived to discharge, and 30 days for patients who died. In the group of patients who survived to discharge after a general surgery intervention, the majority required convalescence in another hospital or rehabilitation facility. For those patients who did not have surgery and survived to discharge, the majority also required convalescence in another hospital or rehabilitation facility. **Conclusions:** Results from this study provide important prognostic information for healthcare providers as well as patients and families who are faced with a serious diagnosis. A better understanding of the expected outcomes may change the treatment plan selected for patients with intestinal ischemia after cardiac procedures.

Presenter: Dr. James Holden

Presenter Contribution: Literature review, patient chart review, data analysis, writer of abstract

PP15

The safety and effectiveness of hypovolemic phlebotomy on patients undergoing liver surgery: a systematic review and meta-analysis.

Lily Park, Richard Gilbert, Risa Shorr, Aklile Workneh, Kimberly Bertens, Jad Abou-Khalil, Fady Balaa, Guillaume Martel

Division of General Surgery

Domain: Clinical Research

Introduction: Hypovolemic phlebotomy (HP) is an under-reported intervention that demonstrates potential to reduce the high morbidity rates associated with liver surgeries by decreasing blood loss and the need for blood transfusion. It involves intraoperative removal of whole blood from the patient, without volume replacement, to induce a controlled hypovolemic state throughout surgery. The aim of this systematic review was to combine existing data on the safety and effectiveness of HP for liver surgery patients. **Methods:** MEDLINE, Embase, and Cochrane Library databases were searched from inception to February 2018. Primary studies investigating the safety and effectiveness of HP in adults undergoing liver resection and transplantation surgeries were considered. Outcomes included blood loss, transfusion proportion, and major and minor complications. **Results:** 6 studies involving 1296 patients were included. All 6 studies were reviewed narratively while the 4 studies involving solely liver resections were evaluated quantitatively. Difference in means and odds ratios (OR) were calculated using the random effects model. Meta-analysis of 1 randomized control trial (RCT) and 3 high-quality observational studies identified a significant difference in reduced blood loss with HP (-250.04ml, $P = 0.02$). There were no differences in transfusion proportion (OR 0.17, $P=0.07$), major complications (OR 0.84, $P=0.84$) or minor complications (OR 0.98, $P=0.99$). Due to the heterogeneity in study design, the RCT was removed in a sensitivity analysis. This demonstrated significant differences in reduced blood loss (-340.65ml, $P < 0.0001$) and transfusion (OR 0.17, $P<0.0001$) with HP. The narrative summary corroborated these findings. **Conclusion:** Evidence from existing studies suggests associations between HP and reduced blood loss and potentially transfusion proportion. No significant differences were demonstrated regarding major and minor complications. Too few studies are available at this time to draw robust conclusions. Present data lends support for continued exploration of HP to decrease liver surgery morbidity rates.

Presenter: Lily Park

Presenter Contribution: Under the supervision of Dr. Guillaume Martel and the Liver and Pancreas Unit with the General Surgery Department, I helped design and implement the search strategy, reviewed abstracts and relevant full-text studies with a secondary reviewer, evaluated the quality of included studies, completed the data analysis, and wrote the abstract with a secondary reviewer.

PP16

Pilot study of implementation of an enhanced recovery pathway following minimally invasive esophagectomy in a Canadian thoracic academic centre

Stephen Gowing, Hassan Robaidi, Caitlin Anstee, Andrew Seely

Division of Thoracic Surgery

Domain: Clinical Research

Introduction: Open and minimally invasive esophagectomy (MIE) remain the cornerstone of curative intent management of esophageal and esophagogastric junction malignancies. Despite being integral to Enhanced Recovery After Surgery (ERAS) programs, the safety of early po intake and rapid nasogastric tube (NG) removal following MIE is limited. In a pilot study, we sought to estimate the safety and impact of this approach. **Methods:** 33 consecutive single surgeon MIE patients in two cohorts were compared: 17 who received traditional post-operative care and subsequently 16 who followed the ERAS early po intake pathway. For the traditional group laparoscopic feeding jejunostomy was performed at surgery with tube feeds initiated post-op day 1 (POD1). NG tube removal and routine contrast swallow were performed POD6 followed by a progressive oral diet. For ERAS early po intake patients, feeding jejunostomy was not performed, sips of water commenced POD 0-2, NG tube was removed on POD3, clear fluids POD3-4, and full fluids POD5-10 were instituted. Blue dye tests were performed POD2 and POD4 (no routine post-operative contrast swallows performed). LOS and post-operative adverse events (AEs) were compared (median, [interquartile range]). **Results:** Overall LOS (days) was significantly reduced following implementation of pathway in all patients (Traditional 13.5, [11-27]) vs (ERAS 8.0, [7-15]), $p < 0.05$ and in patients experiencing no AEs (Traditional 9, [8.5-10]) vs (ERAS 7, [6-8]), $p = \text{NS}$. The proportion of patients who experienced no AEs was comparable (Traditional 41.2% vs ERAS 43.8%, $p = \text{NS}$). Incidence of TM&M AEs Grade 3 or higher was 41.2% (Traditional) vs 31.3% (ERAS), $p = \text{NS}$. There were no post-operative mortalities within 90 days of surgery. **Conclusions:** Albeit in a pilot study limited by longitudinal design, implementation of early institution of PO intake and removal NG tube on POD3 without feeding jejunostomy following MIE incorporating resulted in a significantly reduced LOS without an increase in post-operative AEs.

Presenter: Dr. Stephen Gowing

Presenter Contribution: Hypothesis generation, Acquisition and Statistical Analysis of Data, Primary Author of Abstract

PP17

Severe traumatic brain injury at the Ottawa Hospital: A 2 year cohort describing epidemiology, presentation, management and outcome

Alexandre Tran, Victoria Saigle, Neeraj Manhas, Lauralyn McIntyre, Colleen Golka, Scott J. Millington, Kwadwo Kyeremanteng, Diana Ghinda, Sal Kanji, Jennifer Fairbarn, Tammy Lloyd, Shane W. English

Division of Other (please specify)

Domain: Quality Improvement Research

Introduction: Severe traumatic brain injury (sTBI) is associated with significant morbidity and mortality. Aggressive acute management of the initial injury, as well as prevention of secondary injuries and complications, are known to improve patient survival. As part of an internal practice audit, we present a 2-year cohort of patients with sTBI at the Ottawa Hospital (TOH) to better understand epidemiology, practices and outcomes. **Methods:** This is a single-centre retrospective cohort of consecutive patients with sTBI admitted to the Ottawa Hospital from January 2014 to December 2015. Patients were identified using two datasets: the TOH Trauma Registry, and TOH Data Warehouse. We included patients that: (a) were ≥ 16 years of age, (b) had blunt head injury, and (c) had a sustained or deterioration to Glasgow Coma Score (GCS) < 9 within 24h. Screening was performed by a single reviewer with a second completing a 10% sample audit. Data points included: a) baseline, clinical presentation and hospitalization characteristics, b) interventions, and c) outcomes. **Results:** We reviewed 795 records and included 126 patients. Median age was 67 years (44 – 80) and 83 (66%) patients were male. Median injury severity score was 26 (25 – 35). There were 95 (75.4%) patients with critical head injuries as scored by the abbreviated injury scale. There were 15 (12%) patients requiring craniectomy, 115 (90%) requiring ICU admission and 10 (8%) receiving ICP monitoring. Median hospital length of stay was 17 (3 – 32) days. Overall mortality was 55% with 33% of deaths occurring within 24 hours and 51% within 48 hours. Of those dying, 74% were palliated with a median time to palliation of 1 (0.8 – 3.8) day. **Conclusion:** This cohort provides a comprehensive and multidisciplinary overview of the care pathway and outcomes for patients with sTBI at TOH. Further work will be done to better understand patient-level determinants of varying interventions and to identify opportunities for optimization of practice patterns and outcomes.

Presenter: Neeraj Manhas

Presenter Contribution: Methodology design Data extraction Manuscript creation

PP18

Thoracic Cortical Bone Trajectory Screws for Cervical Thoracic Fixation – A Comparative Review

Alexandra Bunting, Eugene Wai

Division of Orthopaedic Surgery

Domain: Clinical Research

Introduction: The Cortical Bone Trajectory (CBT) is a novel lumbar pedicle screw trajectory that was first described by Santoni and Hynes et al. in 2009. It maximizes thread contact with cortical bone and has been shown in biomechanical studies to have a 30% increase in pullout strength and 70% higher insertional torque compared to the traditional pedicle screw (PS). Cervical-thoracic fixation is complicated by the differential fixation of the cervical and thoracic spine which requires connecting rods that may decrease construct strength. In addition, CBT has been proposed for use in osteopenic or osteoporotic bone. Herein we aim to compare clinical and radiographic outcomes of CBT screws in the upper thoracic spine to the PS technique. **Methods:** Retrospective chart review of consecutive patients undergoing posterior cervical thoracic fixation at the Ottawa Hospital between 2013-2016. Data will be collected by one independent observer, and will include demographics, reason for OR, complications clinically and on imaging, pre-operative and post-operative kyphosis/lordosis and distance between screws at C6 and T1, and re-operation rate. The ten patients with CBT are matched to similar patients with respect to demographics who received the PS technique. **Results:** The complication rate clinically and radiographically, as well as re-operation rates are not significantly different between groups. Further analysis underway. **Conclusion:** Preliminary results suggest that cortical pedicle screws are not inferior to the traditional technique in the upper thoracic spine in our limited series. These findings will serve as the basis for a larger non-inferiority study or randomized control trial in the future.

Presenter: Dr. Alexandra Bunting

Presenter Contribution: submission of ethics, data collection, (data analysis underway) and than I will be writing up the manuscript.

PP19

Academic General Surgery: How gender and academic productivity relate to academic and leadership promotion

Frank Battaglia, Kristan Staudenmayer, Sabeena Jalal, Faisal Khosa

Division of General Surgery

Domain: Quality Improvement Research

Introduction: Academic productivity is the measure most commonly employed to make decisions on faculty appointments, permanence, and promotion. Publications, citations, and h-index are bibliometrics commonly used as the measures of academic productivity. This study explores the impact of gender on the academic and leadership ranks of academic general surgeons across Canadian and US academic faculties. **Methods:** Data was collected from general surgical departments offering residency training in USA and Canada. The information gathered about faculty members included gender, quantification of bibliometrics, and academic achievement. The data was analysed using non-parametric methods in Stata Version 14.2. **Results:** There were a significantly higher number of men [3094 (79.39%)] among the academic faculty in the specialty of General Surgery in North America, compared to women [803 (20.61%)] ($\chi^2=55.046$; $p\text{-value}\leq 0.001$). This trend was also seen in leadership roles, where men [463 (84.03%)] were significantly in higher numbers than women [88 (15.97%)] ($\chi^2=8.35$; $p\text{-value}=0.004$). Men in the field of general surgery had 1.58 times the odds of having a higher h-index than women when all other variables were constant. However, when the h-index was adjusted by the years of research conducted by the faculty members of general surgery (m-index), we found that women outperformed men in academic productivity at every level of academic appointment. **Conclusions:** While the absolute academic productivity is higher for men in academic general surgery, when normalized by years of academic research, women become more productive. Furthermore, women have a higher number of citations per year of academic research, indicating that women in academic general surgery also produce more high-quality research than men. However, with both of these factors, women are still not reaching representative distributions in academic and leadership positions, meaning other factors are preventing women from upward career mobility in academic general surgery.

Presenter: Frank Battaglia

Presenter Contribution: I was responsible for assisting with data collection, primary drafting of manuscript, completing subsequent revisions, and the corresponding author for publication.

PP20

Outcomes following surgery for sagittal craniosynostosis: Local results for national collaborative

Grayson Roumeliotis, Nicholas Cormier, David McAuley, Daniel Peters

Division of Plastic Surgery

Domain: Clinical Research

Introduction: Many different procedures are used to correct the scaphocephaly associated with sagittal craniosynostosis. These procedures vary substantially with respect to invasiveness, operative time, and recovery, and can be categorized as either endoscopic, ablative, and total cranial vault remodeling (TCR). We have organized a National collaborative to compare the retrospective outcomes after these procedures. Here, we describe the organization of this collaborative, and our local results. **Methods:** Canadian craniofacial surgeons were contacted through the Canadian Forum for the Advancement of Craniofacial Expertise (FACE). Resident participation was coordinated through the Canadian Resident Plastic Surgery Research Collaborative (CRPSRC). Our primary outcomes are those associated with aesthetic improvement (cephalic index, and reoperation rate), and secondary outcomes are those associated with morbidity and cost. Study data were collected and managed using REDCap electronic data capture tools hosted at the Children's Hospital of Eastern Ontario. Comparisons between groups were made using two-tailed independent samples t-tests. **Results:** 19 children with non-syndromic sagittal craniosynostosis were identified in our review. Of these, 12 were treated with ablative procedures, and 7 with TCR. Younger children (4.41 months, SD=1.67) were treated with ablative procedures, and older children (10 months SD= 7.14) were treated with TCR. Preoperative cephalic index was significantly worse in the TCR group (61.6 SD=3.41) relative to those receiving ablative procedures (68.8, SD=2.7; $p=0.0001$). Post-operative cephalic index was not different between ablative (74.9 SD=3) and TCR groups (74.1 SD= 7.3). In each group there were no revision surgeries required. Secondary outcomes such as estimated blood loss, transfusion volume, ICU stay, and hospital stay were not significantly different. **Conclusions:** Our local results suggest that ablative surgery and total cranial vault remodeling provide similar aesthetic outcomes with similar morbidities. However, results from our National partners will provide a larger sample size, and improve the generalizability of our results.

Presenter: Dr. Grayson Roumeliotis

Presenter Contribution: designed study protocol, developed RedCap data collection tool, organized national collaborative, data analysis

PP21

A randomized, controlled trial comparing Stockinette cast padding and Webril cast padding for treatment of clubfoot by the Ponseti method of serial manipulation and casting.

Kevin Smit, Marcel Abouassaly, Meaghan Marien and Ken Kontio

Division of Orthopaedic Surgery

Domain: Clinical Research

Introduction: Clubfoot is one of the most common congenital orthopedic conditions and is most frequently treated with the Ponseti casting method. While several studies have examined different aspects of non-operative treatment, none have explored the effect of different types of cast padding on outcome. The purpose of this study is to compare the effects of Stockinette versus Webril in clubfoot patients treated with the Ponseti method. **Method:** A randomized controlled trial was performed comparing Stockinette and Webril cast padding for the treatment of clubfoot using the Ponseti method of serial manipulation and casting. Inclusion criteria consisted of patients under the age of 6 months at the initiation of treatment and who had previously untreated idiopathic clubfoot. Patients were randomized to double Stockinette or standard Webril cast padding at the initiation of treatment. The primary analysis consists of a two-sample t-test comparing the mean number of casts required in each study group prior to tenotomy. Secondary outcomes include initial and final standardized clubfoot scores (Pirani and Dimeglio scores) and adverse events. **Results:** Forty-eight patients were equally randomized to the Stockinette and Webril groups with the mean age at initiation of treatment being 19.2 days and 22.3 days respectively. Primary outcome scores revealed an equivalent number of casts required prior to tenotomy in both groups (4.0 ± 1.0 vs 4.1 ± 1.1 , $p=0.39$). Meanwhile, the initial ($p=0.18$) and final ($p=0.32$) Dimeglio scores were comparable between the Stockinette and Webril groups, as were the initial ($p=0.46$) and final ($p=0.31$) Pirani scores. Minor skin complications were noted in 33% of patients in each group. **Conclusion:** When compared to Webril, Stockinette cast padding provides equivalent clubfoot deformity correction while applying a similar number of casts prior to tenotomy with no significant increased adverse events. As a result, double Stockinette cast padding is a reasonable, safe, and easy-to-use alternative to Webril padding for the effective treatment of idiopathic clubfoot using the Ponseti method of serial casting

Presenter: Dr. Meaghan Marien

Presenter Contribution: Data analysis and presentation

PP22

Safety of ureterolysis in the management of retroperitoneal fibrosis

James Ross, Neal Rowe

Division of Urology

Domain: Clinical Research

INTRODUCTION: Retroperitoneal fibrosis (RPF) is a rare condition that can cause ureteric obstruction. Conservative management includes pharmacotherapy, placement of ureteric stents, and percutaneous nephrostomy tubes. Definitive surgical management with ureterolysis is typically reserved for patients failing conservative treatment. However, current literature on complications is limited to small, single centered series. In this study we utilized a large, multi-centered database to assess the short-term surgical outcomes of ureterolysis for patients with RPF. **METHODS:** Using the American College of Surgeons National Quality Improvement Program (NSQIP) database, a retrospective review was conducted on patients who underwent ureterolysis for retroperitoneal fibrosis between January 1st, 2006 and December 31st 2016. Only patients who underwent ureterolysis as a principle operative procedure by a urologist were included. Complications within 30 days of surgery were captured in the data set and organized based on Clavien-Dindo classification. The frequency of secondary urologic procedures at time of initial ureterolysis was identified. **RESULTS:** One hundred patients (51 Male, 49 Female) were included, with a mean age of 57 (IQR 43, 66). Four underwent a secondary urological procedure: 1 ureteroureterostomy, 2 ureteroneocystostomy, and 1 ureteroneocystostomy with psoas hitch/bladder flap. The overall complication rate was 12%, of which almost all were Clavien grade I or II (wound or urinary infection). Only one patient required return to OR (Clavien III) and there were no high-grade complications (Grade IV or V). **CONCLUSIONS:** To our knowledge, this is the largest study of perioperative complications from ureterolysis in the setting of retroperitoneal fibrosis. The overall complication rate was low and the majority of complications were low grade (Clavien grade I or II). Furthermore, the frequency of secondary urologic procedure at the time of ureterolysis was low. As such, ureterolysis, although invasive, likely represents a safe treatment option for ureteric obstruction secondary to RPF.

Presenter: Dr. James Ross

Presenter Contribution: Protocol creation, REB submission, data collection and processing, written abstract

PP23

Oncoplastic breast surgery combining with immediate contralateral breast reduction: Oncological safety, surgical outcome and patient satisfaction

Hannah St. Denis-Katz, Aisling Fitzpatrick, Louise Gresham, Jing Zhang

Division of Plastic Surgery

Domain: Clinical Research

Introduction: Breast reconstruction and preservation of breast appearance post breast cancer ablation correlates with better psychosocial outcomes. There is limited literature discussing breast surgical oncologists and plastic surgeons performing oncoplastic breast conserving surgery with immediate contralateral balancing breast reduction. This study examines oncological safety, surgical outcome and patient satisfaction in these patients. **Method:** This is a retrospective chart review of patients treated with oncoplastic breast conserving surgery and immediate contralateral breast reduction at a single breast cancer centre. Demographic, clinicopathologic characteristics, complications and BREAST-Q surveys pre-op and at three month follow up were analyzed. **Results:** Forty-eight patients underwent oncoplastic breast surgery and contralateral reduction between October 2014 and December 2017. Mean age was 56 years with mean follow up of 58 weeks. Complete excision with negative margins was obtained in 42 patients (87.5%). Positive margins were found in six patients (12.5%); all went on to have repeat lumpectomy with clear margins. No patients had local recurrence. The most common tumor histopathologies were invasive ductal carcinoma (58.3%). The mean lumpectomy size was 439g and reduction size was 472g. Wise pattern reduction (64.6%) with superomedial pedicle (66.7%) was most commonly used for the reduction side. Rates of complications were 18 (37.5%) having minor complication (defined as being managed as an outpatient) and one (2.1%) having a major complication requiring hospitalization. BREAST-Q scores improved at three month follow up for all areas including physical well-being, sexual well-being, and most significantly in satisfaction with breasts and psychological well-being. **Conclusions:** Oncoplastic surgery provides safe and reliable treatment for breast cancer, and combining with contralateral breast reduction provides immediate reconstruction with good aesthetic outcome and high patient satisfaction.

Presenter: Dr. Hannah St. Denis-Katz

Presenter Contribution: REB submission Data analysis Abstract writing

PP24

The influence of post-operative capillary blood glucose control on infection following total joint arthroplasty.

Manisha R. Mistry, Johanna Dobransky, Janine C. Malcolm & Robert J. Feibel

Division of Orthopaedic Surgery

Domain: Quality Improvement Research

Introduction: With increasing rates of total joint arthroplasty, and associated post-operative infection, it is increasingly valuable to identify modifiable risk factors to decrease rates of post-operative infection. Dysglycemia in the post-operative period has been associated with increased rates of infection. Additionally, patients without clinical diagnosis of diabetes with hemoglobin A1c values between 5.7% and 6.4% have been shown to be dysglycemic in the peri-operative period. This study examines the influence of post-operative blood glucose management on rates on re-operation for infection in patients undergoing total hip and total knee arthroplasty in diabetic, and clinically non-diabetic patients. **Methods:** We performed a retrospective review of prospectively collected data, for all primary, elective total hip and total knee arthroplasties performed at The Ottawa Hospital between April 2010 and October 2017. A multivariate regression analysis was to determine predictors of infection within 90-days, 365-days and greater than 1 year based on pre-operative diabetes status, HbA1c, and post-operative insulin management. **Results:** A total of 7427 total hip and total knee arthroplasties in 6174 patients met inclusion criteria. There were a total of 78 revisions for infection at any time point (1.05%). Patients with HbA1c of $\geq 5.7\%$ with ($p=0.035$), and without post-operative glucose management ($p=0.026$) were found to be statistically significant predictors of re-operation for infection within 90 days. This was also found to be true for patients with insulin-dependent diabetes ($p=0.014$). Diabetes status and those with HbA1c $\geq 5.7\%$ were not found to be significant predictors of re-operation for infection within 365 days or after 1 year. **Conclusion:** Patients with potentially undiagnosed diabetes mellitus may be at a greater predisposition for developing infection, requiring re-operation, following total joint arthroplasty. A greater focus and more rigorous management strategy may be required, both pre- and post-operatively, for these patients, who otherwise receive no glycemic management outside of hospital.

Presenter: Dr. Manisha Mistry

Presenter Contribution: Complete involvement throughout the entire process of this project including development of study design, proposal, ethics, data analysis and interpretation.

PP25

Aesthetic Areolar Dimensions: An Analysis of the Ideal NAC proportions

Matthew Laschuk, Grayson Roumeliotis, Lindin Head, Howard Silverman

Division of Plastic Surgery

Domain: Clinical Research

PURPOSE: Our current understanding of breast aesthetics define an ideal position for the nipple areolar complex (NAC) on the breast, but not its size. NAC size is typically adjusted to anthropometric norms, rather than an ideal value. We hypothesized that there is an ideal ratio between the diameter of the NAC and the base width of the breast. The purpose of this study is to compare these dimensions in a large series of aesthetically pleasing breasts. **METHOD:** The Sun newspaper (London, United Kingdom) regularly publishes photographs of topless models ('Page 3'), selected specifically for the appearance of their natural breasts. All available photographs were reviewed for inclusion.

Photographs eligible for inclusion provided adequate visualization of the breast base width, areola, and nipple. These variables were measured using Adobe Photoshop CS6 (California, United States). Three independent reviewers performed all measurements, and final ratios were calculated from the mean. **RESULTS:** 58 photographs were eligible for inclusion. The mean areolar diameter to base width was 0.29 (SD=0.05). Mean areola to nipple bud diameter was 3.59 (SD=0.68).

CONCLUSIONS: Based on this sample of internationally appreciated women's breasts, the ideal areolar diameter is 0.29 times the base width. Ideal areolar diameter can also be expressed as 3.59 times the nipple bud diameter. Given that the nipple bud and breast base width are relatively constant, these ratios can potentially be used to optimize the areola size in breast surgery. Further prospective work is required to validate the aesthetics of these estimates.

Presenter: Dr. Matthew Laschuk

Presenter Contribution: Question and hypothesis generation, study design, data collection, writing

PP26

Effect of sex on incidence of post-operative atrial fibrillation in cardiac surgery patients

Janet Ngu, Diem Tran, Fraser Rubens

Division of Cardiac Surgery

Domain: Clinical Research

INTRODUCTION: Post-operative atrial fibrillation (POAF) is common in cardiac surgery patients, contributing significantly to morbidity and length of stay. Female sex is also an independent predictor for poorer outcomes after cardiac surgery. This study sought to investigate if there is a relationship between sex and POAF incidence. **METHODS:** This is a retrospective analysis of prospectively collected observational data. From February 1, 2014 until September 30, 2015, consecutive patients undergoing non-emergent CABG and/or valve surgery at the University of Ottawa Heart Institute were screened for inclusion in the study. A total of 2275 patients were screened and 1415 (1063 males and 352 females) were included in this study. A propensity score was derived using 33 covariates identifying 161 matched pairs of male and female. The primary outcome was the occurrence of new-onset POAF, and the secondary outcomes were in-hospital mortality, perioperative myocardial infarction (MI), stroke, acute kidney injury (AKI) and seizure. Outcomes were assessed using paired analysis techniques **RESULTS:** Before matching, new onset of POAF developed in 25.3% (329/1415) of the entire cohort. The occurrence of POAF was similar in both female and male (26.1% vs 22.3%, $P = 0.139$). Post-matching, the characteristics of both groups were comparable, with a significant reduction of mean bias from 17.6 to 4.6. In the propensity-matched cohort, both female and male had similar incidence of POAF (23.0% vs 26.1%, $P = 0.517$). There was no significant difference between female and male in all secondary outcomes (in-hospital mortality: 1.2 % vs 3.7% [female vs male], $P = 0.152$; AKI: 10.6% vs 17.4%, $P = 0.077$; perioperative MI: 0% vs 0.62%, $P=0.317$; seizure: 1.9% vs 2.5%, $P = 0.702$). **CONCLUSIONS:** Female sex is not associated with occurrence of post-operative atrial fibrillation in patients who underwent non-emergent CABG and/or valve surgery. Both sexes demonstrated comparable clinical outcomes.

Presenter: Dr. Janet Ngu

Presenter Contribution: Data organization, data analysis, drafting of abstract and manuscript.

PP27

Clinical outcomes of nerve transfers in peroneal nerve palsy: A systematic review and meta-analysis

Linden K. Head, Katie Hicks, Gerald Wolff, Kirsty U. Boyd

Division of Plastic Surgery

Domain: Clinical Research

INTRODUCTION: The study objective was to perform a systematic review and meta-analysis of the primary literature to assess the effectiveness of nerve transfer surgery in restoring ankle dorsiflexion in patients with peroneal nerve palsy (PNP). **METHODS:** Methodology was registered with PROSPERO and PRISMA guidelines were followed. MEDLINE, EMBASE, and The Cochrane Library were systematically searched. English studies investigating the outcomes of nerve transfers in PNP were included. Two independent reviewers completed screening and data extraction. Methodological quality was evaluated with Newcastle-Ottawa Scale (NOS). Meta-analysis was performed using descriptive statistics, Kruskal-Wallis test, and Spearman's rho. **RESULTS:** Literature search identified 108 unique articles. Following screening, 14 full-text articles were reviewed – 4 met inclusion criteria for qualitative synthesis and meta-analysis. All included studies were retrospective case series (mean NOS=5.0/6.0). Overall, 41 patients underwent nerve transfer for PNP – mean age of 36.1 years, mean time to surgery of 6.3 months, and a mean follow-up of 19.0 months. Donor nerve was either tibial nerve branches/fascicles (n=36;88%) or superficial peroneal nerve (n=5;12%). Recipient nerve was either deep peroneal nerve (n=24;59%) or tibialis anterior branch (n=17;41%). Postoperative ankle dorsiflexion strength demonstrated a bimodal distribution with a mean Medical Research Council (MRC) of 2.1. There were no significant differences in dorsiflexion strength between injury sites (p=0.491), injury mechanisms (p=0.125), donor (p=0.066), or recipient nerves (p=0.496). There were no significant correlations between dorsiflexion strength and patient age (p=0.094) or time to surgery (p=0.493). **CONCLUSIONS:** There is variability in dorsiflexion strength following nerve transfer in PNP – whereby, there appear to be responders and non-responders. Further studies are needed to better define the role of nerve transfers in the management of peroneal nerve palsy.

Presenter: Dr. Linden K. Head

Presenter Contribution: Involved from project conception to manuscript preparation, including idea conception, systematic search design, systematic search execution, data collection, data synthesis, and manuscript preparation.

PP28

Glenoid Exposure in Shoulder Arthroplasty: What is the role of soft tissue releases?

Lisa Lovse, Kathryn Culliton, J Pollock, Hakim Louati, Peter Lapner

Division of Orthopaedic Surgery

Domain: Clinical Research

Introduction: The deltopectoral approach is commonly used in shoulder arthroplasty but obtaining adequate glenoid exposure for instrumentation and component insertion can be challenging. Various soft tissue releases may be performed to obtain glenoid exposure including the long head of biceps tendon, pectoralis major tendon, inferior capsule, and the posterior capsule. Greater tuberosity osteotomy and deltoid release may also be used to improve exposure. The primary objective of this study was to quantify the effects of various releases on the amount of glenoid surface area exposure in the deltopectoral approach. **Methods:** We performed a standard deltopectoral approach on 8 cadaveric shoulders in the beachchair position. A custom designed jig was used to determine the extent of glenoid exposure. The following releases were performed: long head of biceps, pectoralis major tendon, inferior capsule, posterior capsule, and deltoid. Following each release, the jig was used to mark the exposed glenoid surface. Once all releases were completed and marked, soft tissue was removed and the glenoid was digitized using a 3D surface scanner to quantify exposed surface area with each release. The exposed area associated with each release was presented as a percentage of the total glenoid surface area. **Results:** The mean glenoid surface area exposure prior to any releases was 57% (SD 8%). Following release of the long head of biceps, glenoid surface area exposure increased to 69% (SD 10%). Exposed area was increased to 83% (SD 6%) with release of the pectoralis major, and 94% (SD 2%) with inferior capsule. The entire glenoid was exposed following posterior capsule and deltoid release. **Conclusions:** Release of the long head of biceps, pectoralis major, inferior and posterior capsule all independently led to significant increases in glenoid surface exposure in the deltopectoral approach. Mean surface area exposed with all three releases was 94%. Although deltoid release improved exposure, the results of this study indicate that this is rarely necessary.

Presenter: Dr. Lisa Lovse

Presenter Contribution: I have a central role as the resident involved in this study, being involved in every step of the project including: 1) Literature review/synthesis of current state of knowledge regarding glenoid exposure in the deltopectoral approach to the shoulder 2) Development of the research proposal 3) Ethics application for use of cadavers 4) Dissection of the cadaveric specimens and surgical glenoid exposure in conjunction with the senior study investigator 5) Preparation of the specimens for analysis 6) Data analysis and interpretation 7) Manuscript preparation.

PP29

Prognostic accuracy of the quick sequential organ failure assessment (qSOFA) for mortality in patients with suspected infection: A systematic review and meta-analysis

Shannon M. Fernando, Alexandre Tran, Monica Taljaard, Wei Cheng, Bram Rochweg, Andrew J.E. Seely, Jeffrey J. Perry

Division of General Surgery

Domain: Clinical Research

Introduction: The quick Sequential Organ Failure Assessment (qSOFA) has been proposed for prediction of mortality in patients with suspected infection. In this study, we summarize and compare prognostic accuracy of qSOFA and Systemic Inflammatory Response Syndrome (SIRS) criteria for prediction of mortality in adult patients with suspected infection. **Methods:** We searched four databases from inception through November 2017. We included English-language studies utilizing qSOFA for prediction of mortality (in-hospital, 28-day, or 30-day) in adult patients with suspected infection in the Intensive Care Unit (ICU), Emergency Department (ED), or hospital wards. Two investigators independently extracted data using a standardized form; quality was assessed using Quality Assessment of Diagnostic Accuracy Studies 2 (QUADAS-2) criteria. **Results:** 38 studies were included (385,466 patients). qSOFA was associated with a pooled sensitivity of 60.8% (95% confidence interval [CI]: 51.4 to 69.4) and pooled specificity of 72.0% (95% CI: 63.4 to 79.2) for mortality. The SIRS criteria were associated with a pooled sensitivity of 88.1% (95% CI: 82.3 to 92.1) and a pooled specificity of 25.8% (95% CI: 17.1 to 36.9). The pooled sensitivity of qSOFA was higher in the ICU population (87.2%, 95% CI: 75.8 to 93.7) than the non-ICU population (51.2%, 95% CI: 43.6 to 58.7). Pooled specificity of qSOFA was higher in the non-ICU population (79.6%, 95% CI: 73.3 to 84.7) than the ICU population (33.3%, 95% CI: 23.8 to 44.4). **Conclusion:** qSOFA was associated with poor sensitivity and moderate specificity for short-term mortality. The SIRS criteria had superior sensitivity to qSOFA, supporting its use for screening patients, and as a prompt for treatment initiation.

Presenter: Dr. Alexandre Tran

Presenter Contribution: Study conception Methodology design Data extraction Manuscript creation and revision

PP30

Gender is associated with promotion among Canadian academic surgeons

Nada Gawad, Alexandre Tran, Andre Martel, Nancy Baxter, Molly Allen, Neraj Manhas, Fady Balaa

Division of General Surgery

Domain: Education Research

Introduction: Female physicians are less likely to be full professors in the United States, but gender disparities in faculty rank have yet to be studied in Canada. The purpose of this study is to determine if differences in region, training, research productivity, and years in practice explain gender differences in academic promotion among Canadian surgeons. **Methods:** A cross-sectional database of practicing faculty-appointed general surgeons in Canada in 2017 was developed using searches of publicly available physician directories, university and hospital websites, and direct communication with departments. Information included gender, region, year of residency completion, graduate education, participation in the Clinician Investigator Program, fellowship training, number of publications, and Scopus H-index as a marker of publication impact. The dependent variable was binary, defined as whether full professorship was attained or not. All variables were analyzed in a multivariable logistic regression. **Results:** Of the 429 surgeons included, 112 (26%) were female. Seventy-one (63%) of females were assistant professors, compared to 123 (38.8%) of males. Conversely, 6 (5.4%) of females were full professors, compared to 78 (24.6%) of males. While females completed residency more recently (15.1 vs. 20.1 years, $p < 0.001$), male and female surgeons did not differ significantly in their number of publications as residents (3.15 vs. 2.84, $p = 0.59$) or per year of practice (2.49 vs. 1.97, $p = 0.10$), number of fellowships pursued ($p = 0.33$), or graduate education ($p = 0.07$). Gender remained significantly associated with obtaining full professorship (OR 3.71, 95% CI 1.22-11.27, $p = 0.02$) along with practice years (OR 1.61, 95% CI 1.10-2.37, $p = 0.01$) and total publications (OR 1.62, 95% CI 1.10-2.37, $p = 0.01$) in the multivariable model. The model's c-statistic was 0.91. **Conclusion:** Female surgeons with faculty appointments in Canada are significantly less likely to receive promotion to full professor when controlling for years in practice, clinical and graduate training, and measures of research productivity. Responsibility lies on universities to address the pervasive inequities in systems of promotion.

Presenter: Dr. Nada Gawad

Presenter Contribution: Idea conception, data collection, data interpretation, preparation of dissemination materials

PP31

Female radical cystectomy patients have a higher risk of surgical site infections.

Hamidreza Abdi, Ehab Elzayat, Ilias Cagiannos, Luke T Lavallée, Sonya Cnossen, Anatheia S Flaman, Ranjeeta Mallick, Chris Morash, Rodney H Breau

Division of Urology

Domain: Clinical Research

INTRODUCTION: Surgical site infections (SSI) are common after radical cystectomy. The objectives of this study were to evaluate if female sex is associated with post operative SSI and if experiencing an SSI was associated with subsequent adverse events. **METHODS:** This was a historical cohort study of radical cystectomy patients from the American College of Surgeons' National Surgical Quality Improvement Program (ACS-NSQIP) database between 2006 and 2016. The primary outcome was development of a surgical site infection (superficial, deep, or organ/abdominal space) within 30 days of surgery. Multivariable logistic regression analyses were performed to determine the association between sex and other patient/procedural factors with SSI. Female patients with SSI were also compared to those without SSI to determine risk of subsequent adverse events. **RESULTS:** A total of 9275 radical cystectomy patients met the inclusion criteria. Surgical site infections occurred in 1277(13.7%) patients, 308 (16.4%) females and 969(13.1%) males (OR=1.27; 95%CI 1.10-1.47; p=0.009). Infections were superficial in 150 (8.0%) females versus 410 (5.5%) males (p<0.0001), deep in 40 (2.1%) females versus 114 (1.5%) males (p=0.07), and organ/abdominal space in 118 (6.2%) females versus 445 (6.0%) males (p=0.66). On multivariable analysis, female sex was independently associated with SSI (OR=1.21 CI: 1.01-1.43 p=0.03). Females who experience SSI had higher probability of developing other complications including wound dehiscence, septic shock, and need for reoperation (all p>0.05). **CONCLUSIONS:** Female sex is an independent risk factor for SSI following radical cystectomy. More detailed study of patient factors, pathogenic microbes, and treatment factors is needed. Until more information is available, careful vaginal preparation and prophylactic perioperative antibiotics that cover vaginal flora seem appropriate.

Presenter: Dr. Hamidreza Abdi

Presenter Contribution: Data collection, study design, manuscript draft

PP32

A systematic review of prophylactic antibiotic use in endoscopic endonasal transsphenoidal surgery for pituitary lesions

Ioana Doina Moldovan, Idara Edem, Charles Agbi, Shaun Kilty, Fahad Alkherayf

Division of Neurosurgery

Domain: Clinical Research

Introduction. The benefit of prophylactic antibiotic use in endoscopic endonasal transsphenoidal surgery (EETS) for pituitary lesions is controversial. Many surgeons administer antibiotics perioperatively not based on clear guidelines but “to be safe”. There are various prophylactic antimicrobial regimens used in EETS without a demonstrated proof of effectiveness. We aimed to determine if antibiotic prophylaxis use reduces the risk of infection (e.g., meningitis, sinusitis) within 30 days after surgery, in adult patients with pituitary lesions undergoing EETS. **Methods:** A systematic review was performed to assess the effectiveness of perioperative antibiotic use in preventing infectious complications for patients undergoing EETS. Databases searched included: Ovid Databases, Scopus, PubMed and the Cochrane Library. The studies included were: randomized controlled trials including two or more groups comparing antibiotic-placebo or antibiotic-antibiotic use perioperatively for EETS, systematic reviews with or without meta-analyses, observational studies, and case series of prophylactic perioperative antibiotic use for EETS. The end points assessed were the rates of meningitis and sinusitis as infectious complications after EETS. **Results:** A total of 280 articles were identified by the initial literature search. Four studies met the inclusion criteria: three retrospective descriptive cohort studies and one prospective case series study. The study participants received various antibiotic regimens perioperatively. The quality of studies did not permit performance of a meta-analysis. **Conclusion:** There has been no demonstrated need for the use of prophylactic antibiotics in patients with pituitary lesions undergoing EETS. Our systematic review identified a limited number of published studies assessing this question, all observational. Randomized control trials are needed to evaluate the effectiveness of prophylactic antibiotic use in patients with pituitary lesions undergoing EETS.

Presenter: Dr. Idara Edem

Presenter Contribution: I assisted with manuscript writing and editing.

PP33

Testing the efficacy of self-study videos for the surgery clerkship rotation: A project in innovation of undergraduate medical education

Nikhile Mookerji, Julie El-Haddad, P. Thin Vo, Christine Seabrook, BK. Lam, R.J. Feibel, Sean Bennett

Division of General Surgery

Domain: Education Research

Purpose of Study: As a large portion of surgical clerkship learning occurs in the clinical environment, standardization of the curriculum is a challenge. To ensure clerkship students have adequate exposure to the required objectives, a series of objective-aligned self-directed learning videos were developed. We aimed to test the efficacy, as well as user satisfaction, of these videos. **Methods:** Nineteen core topics in general surgery, urology, and orthopedics were identified from the clerkship objectives and narrated, prezi-style videos were created. Ten question multiple choice quizzes were compared before and after students watched the video. Two-tailed paired samples t-test was used to compare results. A short post-video survey was completed to provide subjective data on the student's perceptions of the videos. **Results:** Clerkship students watched a video and completed both quizzes a total of 158 times. Preliminary results show a mean increase of 2.5, 2.4, and 2.0 points between pre and post-test results for general surgery, orthopedics, and urology videos respectively ($p < 0.001$). 98% of students noted they would recommend the videos to their classmates and 75% preferred this teaching modality over traditional mediums such as textbooks. **Conclusion:** This study demonstrates the feasibility and efficacy of a student and resident-created educational tool for the surgical clerkship. A significant improvement in quiz scores was demonstrated after watching the videos, and students found the resources very useful as learning adjuncts. We believe that making these resources available for clerkship students will allow for improved self-directed learning, and improved standardization of learning the core surgical objectives.

Presenter: Nikhile Mookerji

Presenter Contribution: Developed the transcripts and narration for the videos. Created pre- and post-test questions, compiled data and analyzed results.

PP34

Are group practices the way of the future for surgery? A scoping review

San (Hilalion) Ahn, Terry M. Zwiép, Joshua A. Greenberg, Fady Balaa, Daniel I. McIsaac, Reilly P. Musselman, Isabelle Raiche, Lara Williams, Husein Moloo

Division of General Surgery

Domain: Quality Improvement Research

Introduction: Group practices have the potential to positively impact patients and physicians. Physician organization into groups has been successful in the United States but has not been adopted to the same extent in Canada, especially in surgical specialties. The objective of this study was to review the literature to assess the impact that group practices have on patients and physicians. **Methods:** A scoping review was performed based on the methodology proposed by Arksey and O'Malley, and refined by Levac and colleagues and a protocol was developed and published. MEDLINE, EMBASE, Cochrane Central, and Cochrane Economic Database were searched. Titles and abstracts were screened by two members and the abstraction results charted and verified. Qualitative and quantitative analyses were then performed to identify key themes. **Results:** The initial search strategy returned 2292 articles. After screening, 132 full text articles were reviewed. 81 articles met the inclusion criteria and were included in the analysis. The majority of these were surveys (63%). The papers were from the United States (57%), Europe (21%), Canada (17%), and others (5%). Family medicine groups were represented most often (77%), followed by surgical specialties (42%), and other specialties (37%). A thematic analysis was performed. Common themes in all disciplines included enhanced quality of life and job satisfaction for physicians when compared to solo practices. Outcomes focused on cost and income were most often associated with papers from the United States. Patient outcomes were not as well studied but did show improvements in access to care and quality of care. **Conclusions:** Group practices were generally found to improve patient and physician outcomes when compared to solo practices and this trend was present from the 1960s to present day. This study has identified areas for further study including the barriers to adoption in Canada and the benefits that existing surgical group practices deliver.

Presenter: San (Hilalion) Ahn

Presenter Contribution: Title and abstract screening, data extraction, qualitative (thematic) and quantitative analysis,

PP35

The educational role of autonomy in medical training: a scoping review

Molly Allen, Nada Gawad, Isabelle Raïche

Division of General Surgery

Domain: Education Research

Background: Medical training is built upon incremental independence, however, limits imposed upon autonomy in recent years have resulted in concern regarding the current quality of medical training. The role of autonomy and its impact on medical education has not been comprehensively reviewed. As such, a scoping review was performed to explore the literature and provide a more thorough understanding of the significance of autonomous practice in medical training. **Methods:** A scoping review was performed given the limited empiric evidence. The MEDLINE electronic database was searched for all study designs on the role of autonomy in medical training. Articles that referenced the medical profession or trainees, and “autonomy”, “independence”, or “supervision” were included. Inclusion criteria was broad given the paucity of studies focusing on the role of autonomy. A three-step selection process was implemented to select articles for final analysis. Data was qualitatively synthesized and analyzed. **Results:** The search yielded 884 articles, of which 307 were included for full-text review. The educational role of autonomy was not mentioned in 167 articles. Of the remaining publications (140) described participant (80) or author (60) opinions regarding the potential benefits of autonomy as an educational strategy, predominantly in residency training. The most commonly identified themes associated autonomy with increased confidence and the development of clinical decision-making skills. Only two studies specifically assessed the role of autonomy: a survey on resident perception of autonomous practice as an educational strategy and a simulation-based study in which autonomous practice led to improved learning outcomes. **Conclusions:** Currently, the literature on the role of autonomy in medical training primarily represents the subjective opinion of medical educators and trainees. A better understanding of the role of autonomy could lead to the development of educational strategies to compensate for the gap left by the current context of decreased autonomy in medical training.

Presenter: Molly Allen

Presenter Contribution: Project design, data analysis and manuscript writing

PP36

Point-of-care hemoglobin testing and liver surgery; How accurate it is?

Janelle Rekman, Aklile Workneh, Purnima Rao, Julie Shaw, Fady Balaa, Kim Bertens, Jad Abou Khalil, Guillaume Martel

Division of General Surgery

Domain: Clinical Research

Introduction: Point-of-care testing (POCT) is used to rapidly assess intra-operative haemoglobin (Hb) levels. Standard accepted differences between POCT Hb and gold-standard lab testing are ± 4 g/L for Hb concentrations < 100 g/L and $\pm 5\%$ for Hb concentrations ≥ 100 g/L. This study looked at the accuracy of POCT Hb values in reflecting serum values and informing transfusion decisions in liver resections. **Methods:** Using a retrospectively-collected database of liver resection patients at The Ottawa Hospital (2010-2017); intra-op POCT Hb values within 2 hours of operative end-time were gathered and compared to closest-in-time (within 8 hours) post-operative serum values. Blood transfusions, trigger Hb values used to determine transfusion, and IV fluids given were collected. **Results:** 205 patients had POCT (HemoCue® 12.7%, iStat® 78.5%, both 8.8%). Average age was 62y (49.3;74.7), 88.3% had malignant disease, 68.3% had major liver resections, and mean blood loss was 1012cc (255;1769cc). Median time-interval between POCT Hb and next serum Hb value was 110 minutes (80,171). The difference between POCT and serum Hb values of 137 patients (66.8%) fell outside of the accepted difference ($r=0.654$, $p<0.00001$). 45 patients had 1+ transfusions based on POCT with mean trigger Hb value of 87.4g/L (62.9;112). Of those, 11 (24.4%) were considered appropriate per OCATH standards. **Conclusions:** Allowing for a short time discrepancy, this study indicates poor correlation between intra-op POCT and serum Hb values during liver resection. Furthermore, it raises concerns on the accuracy of iSTAT and Hemocue in determining the need for transfusion, thus introducing the need for educational programs on POCT use, as well as further prospective study.

Presenter: Dr. Janelle Rekman

Presenter Contribution: Primary. Conceptualization (with Dr. Martel), lit review, design. Data analysis with Aklile Workneh.

PP37

Impact of program specific E-Learning modules on surgical skill and knowledge acquisition in the setting of a junior arthroplasty rotation: The University of Ottawa Experience

Andrew Adamczyk, Lisa Xuan, Johanna Dobransky, Alberto Carli

Division of Orthopaedic Surgery

Domain: Education Research

Introduction: A needs assessment survey was conducted within our residency program in order to assess preferred learning modalities, and explore voids within the teaching curriculum. Based on the needs and trends expressed, we developed an E-learning module to enhance the learning environment within the program. **Method:** The E-Learning module was created for the junior arthroplasty block. The module consisted of intra-operative video acquired with a head mounted camera and summary documents to accompany each respective surgical video. Evidence based literature and hardware manuals relevant to important arthroplasty concepts and procedures were included in the module. Ten junior residents were randomized to either the E-learning or control group. All residents underwent a 30 multiple choice questionnaire (MCQ) exam at the beginning of the academic year to assess their baseline level of knowledge, and at end of rotation. Surgical skill was evaluated using the Ottawa Surgical Competency Operating Room Evaluation (OSCORE). These were completed by staff for the first case, at the midpoint, and at end of rotation. **Results:** Contrary to our expectations, the control group exhibited significantly better mean knowledge MCQ exam results post-arthroplasty rotation when compared to the E-Learning respectively ($p=0.031$). Regarding the OSCORE, the E-Learning group performed better at all time-points within their rotation; however, these were not statistically significant. A strong trend; however, was observed when comparing the first OSCORE between groups ($p=0.057$). Overall, the whole cohort statistically significantly improved between baseline and end of arthroplasty rotation for both knowledge and skill acquisition ($p= 0.046$ and $p= 0.034$, respectively). **Conclusion:** Based on our findings, E-Learning modules do not contribute to improved knowledge acquisition as demonstrated by the MCQ results. However, they do help residents acquire better overall operative skill and at a faster pace than their colleagues; despite no statistical significance. Moving forward, we hope to look at the impact of these modules on short and long term retention.

Presenter: Dr. Andrew Adamczyk

Presenter Contribution: Creator, Ethics Submission, Website Design, Data Collection, Writing

PP38

Economics of lymphovenous bypass

Linden K. Head, Moein Momtazi

Division of Plastic Surgery

Domain: Quality Improvement Research

INTRODUCTION: The objective of this study was to compare the economic impact of complete decongestive therapy (CDT) and lymphovenous bypass (LVB) in the management of extremity lymphedema. **METHODS:** Economics were modeled for a patient with extremity lymphedema undergoing three different clinical pathways: (i) CDT alone; (ii) LVB no longer requiring ongoing CDT; (iii) LVB requiring ongoing CDT. Activity-based cost analysis identified fixed and variable costs incurred with CDT and LVB. Costs were retrieved from supplier price lists, physician fee schedules, and lymphedema therapists. Literature reviews were executed to quantify (a) perioperative and operative costs of microsurgery; (b) time required for LVB; (c) the likelihood of discontinuing CDT following LVB. The net present value (NPV) of all costs incurred for each clinical pathway were calculated. Sensitivity analysis was performed to identify key variables influencing the economic model. **RESULTS:** The NPV of all costs for a patient with extremity lymphedema undergoing treatment were: (i) CDT alone (\$30,000); (ii) LVB no longer requiring ongoing CDT (\$14,000); (iii) LVB requiring ongoing CDT (\$42,000). Taking into account the likelihood of discontinuing CDT following LVB, the NPV of all costs for LVB was \$26,000. Sensitivity analysis demonstrated the following variables to have the greatest impact on treatment economics: life expectancy, likelihood of discontinuing CDT, discount rate, and inflation rate. **CONCLUSIONS:** Lymphedema has substantial ongoing costs irrespective of the treatment modality. Taking into account the potential for patients to discontinue CDT following surgery, the cost of LVB appears favorable compared to CDT alone. The additional surgical costs of LVB are offset by the savings from discontinued ongoing therapy. Despite its limitations as a theoretical economic model, this study provides insight into the potential economic impact of treating lymphedema with LVB.

Presenter: Dr. Linden K. Head

Presenter Contribution: Involved from project initiation to manuscript preparation, including idea conception, hypothesis generation, data collection, analytics, and manuscript preparation.

PP39

Necrotizing soft tissue infection: Diagnostic accuracy of physical examination, imaging, and LRINEC score – A systematic review and meta-analysis

Shannon M. Fernando, Alexandre Tran, Wei Cheng, Bram Rochweg, Kwadwo Kyeremanteng, Andrew J.E. Seely, Kenji Inaba, Jeffrey J. Perry

Division of General Surgery

Domain: Clinical Research

Introduction: Necrotizing soft tissue infection (NSTI) is a life-threatening condition characterized by widespread tissue necrosis. Delay to diagnosis and surgical management is associated with increased mortality. We sought to summarize accuracy of physical examination, imaging, and Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score in diagnosis of necrotizing soft tissue infection in adults with a soft tissue infection clinically concerning for NSTI. **Methods:** We searched six databases from inception through November 2017. We included English studies reporting diagnostic accuracy of testing or LRINEC Score. Outcome was NSTI confirmed by surgery or histopathology. Two reviewers screened all citations and extracted data independently. Summary measures were obtained from the Hierarchical Summary Receiver Operating Characteristic model. **Results:** From 2,290 citations, we included 23 studies (n = 5,982). Of physical examination signs, pooled sensitivity and specificity for fever was 46.0% and 77.0% respectively, for hemorrhagic bullae 25.2% and 95.8%, and for hypotension 21.0% and 97.7%. Computed tomography (CT) had sensitivity of 88.5% and specificity of 93.3%, while plain radiography had sensitivity of 48.9% and specificity of 94.0%. Finally, LRINEC ≥ 6 had sensitivity of 68.2% and specificity of 84.8%, while LRINEC ≥ 8 had sensitivity of 40.8% and specificity of 94.9%. **Conclusion:** This review demonstrates that the vast majority of diagnostic accuracy literature for NSTI is based on CT or LRINEC findings of high-risk populations. We found that individual physical examination signs (fever, hemorrhagic bullae, and hypotension) were poorly sensitive for diagnosis of NSTI. CT had superior sensitivity and specificity to plain radiography in diagnosing NSTI, but may not be readily available in all centres, and may not be suitable for unstable patients. Finally, the LRINEC score was poorly sensitive for diagnosis of NSTI, suggesting that a low score is not sufficient to rule out the diagnosis.

Presenter: Dr. Alexandre Tran

Presenter Contribution: Study conception Methodology design Data extraction Manuscript creation and revision

PP40

A national study of in-residency research productivity among Canadian academic surgeons

Alexandre Tran, Nada Gawad, Andre Martel, Neraj Manhas, Molly Allen, Fady Balaa

Division of General Surgery

Domain: Education Research

Introduction: The demands faced by surgery residents are changing over time as factors such as work-hour restrictions, societal expectations, and increased sub-specialization present competing forces. Resident research is well-established as an important aspect of general surgery training and is related to future research productivity, fellowship training, and eventual academic career. The impact of these competing forces on resident research productivity has not been studied on a national level. The purpose of this study is to describe trends of in-residency research productivity among academic general surgeons across Canada. **Methods:** A retrospective cohort analysis was conducted to identify all practicing academic general surgeons across 17 institutions in Canada utilizing searches of publicly available physician directories, university and hospital websites, and direct communication with departments. A database was created including gender, region, year of residency completion, graduate education, fellowship training, and number of publications during residency. The mean number of in-residency publications by decade was compared using analysis of variance testing. **Results:** Four hundred and thirty-four surgeons were included. Of these, 73% were male, 61.7% completed graduate studies, and 45.2% were designated assistant professor. The median number of fellowships completed was 1 (IQR 0-1) and the median number of years since completing residency training was 17 (IQR 10-26.8). The mean number of in-residency publications for surgeons completing residency in or after 2010 is 4.5, two of which were first-author publications. There was a significant increase in resident research productivity per decade for number of total ($p < 0.001$) and first-author ($p < 0.001$) publications. There was also a significant increase in completion of graduate education per decade ($p < 0.001$). **Conclusion:** This study describes the landscape of research productivity among Canadian general surgery residents who pursue academic practice. The changing demands faced by surgery residents is demonstrated through the significant increase in resident research productivity over time.

Presenter: Dr. Alexandre Tran

Presenter Contribution: Idea co-conception, data collection, data analysis, and interpretation.

PP41

The inter-rater reliability of technical skills assessment and retention of rater training

Nada Gawad, Amanda Fowler, Richard Mimeault, Isabelle Raiche

Division of General Surgery

Domain: Education Research

Introduction: The inter-rater reliability of laparoscopic skills assessment is usually determined in the context of motivated raters from a single subspecialty practice group with significant experience using similar tools. The purpose of this study was to determine what extent of rater training is necessary to achieve good inter-rater reliability between attending surgeons with differing subspecialty practices, and if rater training is retained over periods of non-use. **Methods:** Two attending surgeons assessed a total of 33 laparoscopic cholecystectomy videos using the Global Operative Assessment of Laparoscopic Skills (GOALS) instrument over five scoring sessions distributed across six months. They participated in different types of training sessions prior to their first and third scoring sessions, and retention was tested in their second, fourth, and fifth scoring sessions. Inter-rater reliability was calculated with an intra-class correlation (ICC) in a two-way random-effects model. **Results:** Inter-rater reliability was highest after each training session (Scoring #1 ICC = 0.76, Scoring #3 ICC = 0.74). Inter-rater reliability was not retained 1.5 months after the brief video-based training session (Scoring #2 ICC = -0.17). It was retained 2.5 months after the in-depth discussion training session (Scoring #4 ICC = 0.70), but not 4.5 months later (Scoring #5 ICC = 0.04). **Conclusion:** Good inter-rater reliability can be achieved with different types of rater training, but the impact of rater training is lost in periods of non-use. This suggests the need for further study of the inter-rater reliability of technical skills assessment when performed by the wide variety of surgeon raters as is commonly encountered in the environment of postgraduate resident assessment.

Presenter: Dr. Nada Gawad

Presenter Contribution: My contribution includes study design, data collection (i.e. recording and editing resident videos), data analysis, interpretation, and manuscript writing.

PP42

Direct superior and direct anterior total hip arthroplasty: A comparison of two minimally invasive approaches

Kamal Bali, George Grammatopoulos, Johanna Dobransky, Wade Gofton

Division of Orthopaedic Surgery

Domain: Clinical Research

Purpose: Aim of the study was to compare early results of Total Hip arthroplasty using either Direct Superior Approach (DSA) or Direct Anterior Approach (DAA). **Methods:** This was a retrospective case control study from a single fellowship trained surgeon including 78 patients from each group (DSA and DAA). Variables used for case control included demographic data (age, gender, body mass index), preoperative hemoglobin (Hb) and preoperative clinical scores. The minimum follow up was one year. Outcomes assessed included postoperative Hb, operative time, intraoperative complications, postoperative adverse events, length of stay (LOS) in hospital, discharge destination, 30 day unanticipated visits or readmission rates, acetabular cup orientation (with target orientation defined as inclination 30-50° and anteversion 10-30°), one year follow up clinical scores and revision rate. **Results:** There were no differences in postoperative Hb, intraoperative complications, 30 day unanticipated visits or readmission rates and clinical outcomes or revision rate at one year follow up. DAA group performed better than DSA with respect to median operative time (105 min for DSA vs 95 mins for DAA, $p < 0.002$), median length of stay in hospital (3 days for DSA vs 2 days for the DAA, $p < 0.001$), discharge destination (62 DSA patients went home vs 73 DAA patients who went home, $p = 0.010$) and radiographic target cup orientation (54 DAA cups within target zone vs 35 of DSA cups in target zone, $p = 0.002$). **Conclusions:** Although clinical score and early revision rates are comparable, DAA tends to perform better in some of the other outcomes studied.

Presenter: Dr. Kamal Bali

Presenter Contribution: Study design, data collection, data analysis, manuscript preparation

PP43

External injuries, trauma and avoidable deaths in rural Agincourt, South Africa.

Idara Edem, Peter Byass, Lucia D'Ambruoso, Anna Dare, Kathleen Kahn, Steve Tollman, John Whittaker, Justine Davies

Division of Neurosurgery

Domain: Clinical Research

Introduction: Injuries account for over 5.8 million deaths per year and this burden is highest in low and middle income countries (LMICs). Along with prevention plans, efforts should be made to identify health system deficiencies in care after an injury has occurred. In this study, we used the concept of avoidable deaths. We identified avoidable deaths in trauma in a LMIC setting and used the three delays model for access to care, to analyze trauma care in a LMIC health system. **Methods:** We used verbal autopsy (VA) data from the Agincourt Health and Socio-Demographic Surveillance System (HDSS) in rural South Africa. We identified deaths from trauma, as a subset of External Injury Deaths (EIDs), between 2012 and 2015. We developed criteria to identify avoidable deaths and constructed a three delays framework based on literature review and retrospective descriptive analysis of 2015 VAs. We applied these criteria to EIDs to capture the burden of avoidable EIDs and trauma deaths from 2012-2015 and the implicated delays. We externally validated our findings. Key informant interviews (KIIs) were also performed to explore the perceptions of health care providers (HCPs) on delays to trauma care. **Results:** Avoidable death was defined with a focus on injury survivability, using level of consciousness at the scene and ability to seek care post-injury as indicators. For the 266 EIDs from 2012-2015, the burden of avoidable EIDs was 109 (41%) and 81 (36%) for avoidable trauma deaths. Neurotrauma accounted for 35% of avoidable trauma deaths. The third delay, delay in receiving care, was the largest contributor to avoidable EIDs (62%) and trauma deaths (59%). The KIIs supported these findings and revealed other important factors contributing to delays, including difficult referral systems, lack of equipment, and inadequately trained staff. **Conclusions:** The burden of avoidable trauma deaths in rural South Africa is high and facility-level improvements should be implemented to reduce this burden. We have shown that it is possible to use verbal autopsies to examine avoidable EIDs, thus our methodology is transferable to other countries that use this system.

Presenter: Dr. Idara Edem

Presenter Contribution: I, along with my supervisor, conceptualized the project and developed its methodology. I performed all aspects of data collection, analysis, manuscript writing, with my supervisor's revisions and suggestions at each step.

PP44

Artificial Intelligence in manuscript analysis: using machine learning to automate the peer review process

Luke Witherspoon, Isar Nejadgholi, Najmeh Taleb, Renaud Bougueng, Samuel Witherspoon, Christopher Morash

Division of Urology

Domain: Translational Research

Introduction: The peer review process is an integral part of the scientific method, however, with rising numbers of publications, providing quality, timely peer review has become difficult. There has been limited research into the use of artificial intelligence (AI) to improve this process, and the work that has been done is limited to privately developed systems used by publishers. Using machine learning we present a system for automated peer review. **Methods:** In partnership with IMSRV Data Labs urological journal articles were ingested into our AI engine and then broken into component parts and separated by heading, paragraph, sentence, word, and character in a hierarchical model (tokenization) (Fig. 1). The tokens were fed to the semantic model and word embeddings (vectors) are created for each tokenized sentence. The sentences are then evaluated against a historical dataset to predict a probability of receiving different classes of peer reviewed feedback. This allows our AI engine to compare each aspect of a manuscript to the entirety of the scientific communities published data on the subject. We can then predict the probability of acceptance in the journal relying upon several human specified features. **Results:** Our prototype AI engine continues development to improve accuracy and feedback. Continuing in the prototype phase we are able to compare ingested articles against a wide array of previously published urological and other scientific journals to aid in providing a score of originality. Based on this score we aim to estimate chances of acceptance. Ongoing work continues in assessment of different quality indicators of a manuscript, such as scientific method and statistical analysis. **Conclusions:** The use of AI has been adopted in many facets of our lives, and peer review is a logical application of this technology to aid in scientific progress. We present a novel process for development of an AI engine allowing automation of the peer review process.

Presenter: Dr. Luke Witherspoon

Presenter Contribution: Project design, AI algorithm development

PP45

Ankle-brachial index measurement with an automated blood pressure device: Is it accurate?

Laurence Dufresne, Prasad Jetty, Kim Boles

Division of Vascular Surgery

Domain: Clinical Research

Introduction: The ankle-brachial index (ABI) is used to diagnose peripheral artery disease (PAD) and is often underperformed in general practice because of its time-consuming measurement with continuous-wave Doppler and manual blood pressure cuff at the bedside. Using an automated oscillometric blood pressure device could allow a simpler and faster measurement of ABI. **Methods:** Patients referred to the Vascular Diagnostic Laboratory at The Ottawa Hospital for lower limb duplex and ABI measurement had both Doppler ABI and oscillometric ABI measured. The Doppler ABI was used as the gold standard to evaluate the oscillometric ABI. A Welch Allyn Connex Vital Signs Monitor 6000 Series was used as the automated blood pressure device. **Results:** 100 patients were prospectively enrolled in the study, for a total of 199 legs evaluated. The mean age was 67.2 years old and 60% were men. 32% had diabetes. The mean calculated ABI by Doppler was 0.92 and 41% had an $ABI \leq 0.9$. In 14% of the legs, the Doppler and oscillometric ABI could not be compared because one or both measurements were impossible (due to lack of Doppler signal, noncompressible arteries, or oscillometric device unable to measure the pressure). The sensitivity and specificity of the oscillometric ABI were 80% (95% CI [69,90]) and 90% (95% CI [84,96]) respectively, using the Doppler ABI and a cutoff of 0.9 as the reference. Positive predictive value was 82% (95% CI [73,92]) and negative predictive value was 88% (95% CI [82,94]). Positive likelihood ratio was 7.97 (95% CI [4.36,14.54]) and negative likelihood ratio was 0.23 (95% CI [0.14,0.38]). Area under the curve was 0.936 (95% CI [0.897,0.974]). Analysis using a Bland-Altman plot revealed a mean difference of 0.0026 (95% CI [-0.0189,0.0242], $p=0.809$). **Conclusions:** Using an automated oscillometric blood pressure device appears to be an accurate way to estimate the ABI obtained with the Doppler method, especially when used to rule in peripheral vascular disease.

Presenter: Dr. Laurence Dufresne

Presenter Contribution: I designed the project, collected the data in the vascular laboratory by measuring the patient's ABI with the automated blood pressure machine, collected the demographic data and did the statistics.

PP46

Outcomes of Surgical Management of Localized High-Risk Prostate Cancer: Results from the Prostate Cancer Canadian Collaboration.

Hamidreza Abdi, Ravi Kumar, Jesse Ory, Tarek Lawen , Armen Aprikian, Jonathan J Duplisea , Fred Saad , Wassim Kassouf, Bobby Shayegan, Ricardo A Rendon, Rodney H Breau.

Division of Urology

Domain: Clinical Research

Introduction: Men with localized high-risk prostate cancer (HRPCa) represent those at highest risk of experiencing disease-specific morbidity and mortality. There is limited data on the outcomes of men with HRPCa undergoing radical prostatectomy (RP), and studies assessing predictors of poor outcomes are sparse. We describe the results of the Prostate Cancer Canadian Collaboration.

Methods: We identified 702 men with cNoMo HRPCa treated with RP at 5 Canadian tertiary referral centers between 2005 and 2017. D'Amico criteria was used to define high-risk disease. Clinical and pathologic data were collected retrospectively. Logistic regression was used to determine predictors of: adverse results on surgical pathology, biochemical failure (BCF) (PSA >0.19 at first post-operative PSA) and biochemical recurrence (BCR). **Results:** The median age was 64 years. Median pre-operative PSA was 9 ng/mL (IQR 6.0-18.25). 74% had Grade Group 4 or 5 on biopsy and 23% had \geq cT2c. 53%, 42%, and 4% of men underwent open, robotic and laparoscopic surgery, respectively. Histology showed \geq pT3 disease in 71% of men and 39% had positive margins. 19% received an extended lymph node dissection with 14% having pN1 disease. 31% and 21% received adjuvant and salvage therapies, respectively. 16% of men experienced BCF and 36% of men experienced BCR. At a median follow up of 49 months (range 1-134), 64% remained disease free. **Conclusion:** With a median follow-up of over 4 years, close to two thirds of patients who underwent surgery for HRPCa remained disease free. These findings confirm that surgery remains an excellent option for this high-risk population. Receiving open surgery was a determinant of positive margins and positive nodal disease when compared to a robotic approach. In the absence of prospective data this large multi-institutional analysis may help guide practitioners in their approach to men with HRPCa.

Presenter: Dr. Hamidreza Abdi

Presenter Contribution: Data collection, study design, manuscript draft

PP47

Symptom control and quality of life over time following laparoscopic Heller myotomy and Dor fundoplication for achalasia

Maria Doubova, Hassan Robaidi, Caitlin Anstee, Edita Delic, Anna Fazekas, Sebastien Gilbert, Donna Maziak, Farid Shamji, Sudhir Sundaesan, Patrick Villeneuve, Andrew Seely

Division of Thoracic Surgery

Domain: Clinical Research

Background: Achalasia is a primary esophageal motility disorder characterized by incomplete relaxation of the lower esophageal sphincter and aperistalsis of the esophageal body. Laparoscopic Heller myotomy with Dor fundoplication is the preferred surgical procedure for management of achalasia. The short-term outcomes of this intervention are well documented, but stability and durability of post-operative symptom control over time is less understood. **Methods:** Between 2004 and 2016, 55 patients with achalasia underwent laparoscopic Heller myotomy and Dor fundoplication. Using validated questionnaires, patients rated their symptoms in five domains: pain, gastroesophageal reflux, dysphagia, regurgitation and quality of life, rating their symptoms pre-operatively, 4-weeks post-op, 6-months post-op and yearly following the operation. Responses were graded and the sum was used as a score for all five domains. **Results:** Patients reported significant improvement in their symptom score of dysphagia, pain, gastroesophageal reflux and regurgitation immediately post-operatively ($p < 0.001$). This improvement was maintained up to 7 and 11 years post-op respectively, for pain ($p < 0.001$, $p = 0.05$), dysphagia ($p < 0.001$, $p = 0.02$) and regurgitation ($p = 0.003$, $p = 0.05$). Symptoms of gastroesophageal reflux remained decreased up to 3 and 5 years following the operation ($p = 0.001$, $p = 0.04$, respectively). Compared to their pre-operative score, patients reported some return of reflux symptoms 6-7 years (score 6.2 vs. 4.1, $p = 0.057$) and 8-11 years following the operation (score 5.3 vs. 3.7, $p = 0.4$). Patients reported an improved quality of life post-op (score 0.5 vs. 3.7, $p < 0.001$) and this was maintained consistently up to 11 years following the operation ($p = 0.001$). Following the initial procedure, no patient required re-operation, 3 patients required endoscopic dilatation, and 3 patients required endoscopic investigation without additional management. **Conclusion:** Patients undergoing a Heller myotomy with Dor fundoplication for the management of achalasia have consistent reduction in symptoms of pain, dysphagia, regurgitation and improvement in quality of life up to 11 years following the procedure.

Presenter: Maria Doubova

Presenter Contribution: I completed a chart review to obtain pertinent patient information from electronic medical records, inputted this information into a database, conducted statistical analyses of the data to obtain results, reviewed associated literature and summarized my findings in this abstract.

PP48

Plastic Surgery: Does competitive mean competent?

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Division of Plastic Surgery

Domain: Education Research

Introduction: Plastic surgery remains a competitive specialty within the CaRMS application process. However little evidence exists to suggest successful applicants perform differently when compared across surgical foundations. Simulated training is a rapidly evolving area of surgical education, suited to both educational as well as evaluation roles. Previous research at our institution has demonstrated positive correlation with medical knowledge and communication. This association however has not been evaluated with respect to participant subspecialty. **Methods:** Following established protocol, first-year surgical residents were enrolled in a 1 week surgical simulation programme. Groups of 3-4 residents partook in simulation-based scenarios. Subsequent blinded evaluation was performed using global rating scales consisting of medical expert, communication, and handover skills. Multivariate analysis of categorical data was then undertaken in relation to level of exposure and subspecialty. **Results:** Residents (n=86) were enrolled in the programme over a three year period. Results were analysed in relation to participant exposure, with sub-analysis by discipline. Subspecialty participation included plastic surgery (n=7), ENT (n=7), cardiac surgery (n=4), vascular surgery (n=3), general surgery (n=19), obstetrics and gynaecology (n=17), orthopaedics (n=18), and urology (n=12). Plastic surgery residents averaged highest in both medical knowledge (3.83/5) and communication skills (4.16/5), however this failed to reach significance (p=0.70; p=0.34). Additionally, handover skills between disciplines was not statistically significant (p=0.82). **Conclusions:** While plastic surgery continues to be a competitive specialty, early clinical performance in surgical foundations appears to be comparable across subspecialties. While plastic surgery residents averaged higher in both medical knowledge and communication skills, handover skills were below the total average. Further data collection may better identify significant differences between groups.

Presenter: Dr. Brent Trull

Presenter Contribution: Concept, data collection, statistics, abstract

PP49

Pelvic reconstruction with vertical rectus abdominis mycutaneous flap versus gracilis muscle flap: an outcomes analysis

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Division of Plastic Surgery

Domain: Clinical Research

Introduction: The reconstruction of complex perineal defects following surgery is associated with significant surgical-site morbidity. Perineal wound complications and infections occur in up to 60% and 66% of patients, respectively. Flap reconstruction with a vertical rectus abdominis myocutaneous (VRAM) flap has long been the gold standard, however, gracilis flaps have recently emerged as a safe and effective alternative. The purpose of the present study was to directly compare VRAM and gracilis flap reconstruction of pelvic and perineal defects following pelvic exenteration with respect to morbidity, mortality, and rates of healing. **Methods:** A retrospective study was performed of all patients from 2012-2017 who underwent either VRAM or gracilis flap reconstruction immediately following abdominoperineal reconstruction or pelvic exenteration. Intraoperative and postoperative outcomes were compared between groups. **Results:** Forty-eight patients (20 male, 28 female) underwent immediate perineal reconstruction post-pelvic exenteration, 16 (33%) with a gracilis and 32 (67%) with a VRAM flap. Most patients (94%) had locally advanced cancers. Preoperative radiation was administered in 14 (88%) gracilis and 25 (78%) VRAM flap cases. Overall, there were no significant differences in minor complications (31% vs 34%, $p=0.8$), major complications (13% vs 9%, $p=1.0$), and 3-year mortality (18% vs 6%, $p=1.0$) between the gracilis and VRAM groups. Abdominal wall complications were not increased in the VRAM group compared to the gracilis group (31% vs 25%, $p=0.67$) despite harvest from the abdominal wall. The mean and median time to complete wound healing was significantly reduced in the gracilis vs the VRAM group (mean 47 days vs 139 days, $p=0.009$; median 48 days vs 69 days, $p=0.02$). **Conclusions:** In the present study, we demonstrate complication rates of VRAM and gracilis-based reconstruction which are consistent with that of previously reported literature. To the best of our knowledge, this is the first study to demonstrate that gracilis flaps are associated with a clinically significant improvement in healing time (mean of 92 days less) compared to VRAM-based reconstruction.

Presenter: Aneesh Karir

Presenter Contribution: I drafted and submitted the REB proposal, including protocol and data collection forms. I conducted data collection and contributed to abstract and manuscript writing.

PP50

Surgical castration in the management of metastatic prostate cancer: Current trends in androgen deprivation therapy in the Canadian healthcare system

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Division of Urology

Domain: Quality Improvement Research

Introduction: An increase in novel therapies for metastatic prostate cancer (mPC) has resulted in an increased cost associated with disease treatment. The vast majority of Canadian patients treated for mPC receive pharmaceutical androgen deprivation therapy, compared to the gold standard treatment of surgical castration (SC). In public health systems with limited resources, there is a responsibility for all physicians to consider treatment costs as part of their role as managers. A previous cost analysis by the same authors has identified the potential for significant cost-savings through increased use of SC in the treatment of mPC. Here, we aim to identify current practice patterns and attitudes of Canadian urologists regarding the treatment of mPC. **Methods:** An survey was developed with the aim of assessing current practice patterns and attitudes in the treatment of mPC. Information collected included practice demographics and current practices in the treatment of mPC. This survey was distributed via email to approximately 700 urologists across Canada. Responses were tabulated and analyzed. **Results:** Survey responses were obtained from urologists in all 10 Canadian provinces and included urologists practicing in both academic and community settings. 50% of respondents indicated they only sometimes offer SC, while 37% of respondents stated that they do not routinely offer SC as a treatment for mPC. 81% of respondents estimated that currently <5% of their patients have been treated with SC. Factors preventing wider adoption of SC included perceived negative attitudes of patients towards SC, invasiveness of surgery, and lack of operating room availability. 72% of respondents felt that SC is an underutilized treatment and 66% agreed that urologists should more actively offer SC. 75% of respondents stated they would like to see more data on the cost-effectiveness of SC in the Canadian healthcare system. **Conclusions:** Surgical castration is likely an under-utilized treatment modality with potential for significant cost-savings in the treatment of mPC in Canada. Further study with formal cost-analysis is warranted.

Presenter: Dr. Patrick Anderson

Presenter Contribution: Research question development, research design, survey distribution and collection, data analysis

PP51

Explant of a ball and cage valve 42 years after initial implant

Frank Battaglia, Lisa Mielniczuk, Jean-Yves Dupuis, Vincent Chan

Division of Cardiac Surgery

Domain: Clinical Research

Introduction: In 1960, the first ball-valve prostheses, named the "Starr-Edwards" valve after its inventors, were used in 8 patients with class III-IV heart failure. Although use of the SE valve improved heart failure symptoms for selected patients, thromboembolic events were the most common and severe complications of these valves. The succeeding generation of mechanical heart valves included the tilting disc, followed by contemporary bileaflet valves. Our patient underwent mitral valve re-replacement of a Starr-Edwards mitral valve implanted 42 years previously. This is one of the longest reported intervals for prosthetic valve function. **Methods:** This case report was developed through a review of patient files, as well as imaging and intra-operative notes. **Results:** Our patient initially underwent mitral valve replacement with a Starr-Edwards valve in 1974 for rheumatic mitral stenosis at Toronto General Hospital. She was anticoagulated with Coumadin for a target international normalized ratio of 2.5 to 3.5. From 1974 onward, the patient never experienced any significant thrombotic or hemorrhagic complications. However, in 2015, the patient developed increasing dyspnea and fatigue. Transthoracic echocardiography showed mildly elevated transprosthesis gradients, with early-onset pulmonary hypertension, tricuspid regurgitation, and right heart dysfunction. Mitral valve re-replacement was recommended. In June of 2016, 42 years after initial implantation, the patient underwent valve re-replacement. The postoperative echocardiogram showed no evidence of perivalvular leak and a mean transprosthesis gradient of 2 mm Hg. One year after surgery, the patient remained asymptomatic without functional limitations or evidence of hemorrhagic or thromboembolic events. **Conclusions:** We report the case of a patient who underwent mitral valve re-replacement with a contemporary mechanical prosthesis 42 years after initial mitral replacement with a Starr-Edwards valve. To our knowledge, this represents the longest interval for reoperation after Starr-Edwards mitral valve replacement for a patient in Canada and among the longest in the literature.

Presenter: Frank Battaglia

Presenter Contribution: I was the primary author. I collected the data from the patient files, wrote the manuscript, made revisions, and was responsible for publication correspondence.

PP52

Influence of adjuvant antibiotics on fistula formation following incision and drainage of anorectal abscesses: A systematic review & meta-analysis

Laura Baker, Remington Winter, Caitlin Cahill, Dean Fergusson, Lara Williams

Division of General Surgery

Domain: Clinical Research

Background: The use of antibiotics following incision and drainage (I&D) of perianal abscesses (PA) is controversial. The objective of this review is to summarize the available evidence on the role of antibiotics following I&D of PA on fistula formation. Secondary objectives include determining if antibiotics are associated with morbidity, repeat presentation to the emergency department (ED) and requirement for reoperation. **Methods:** EMBASE, Medline and CINAHL were systematically searched from inception to March 9, 2018. Clinicaltrials.gov and The World Health Organization trials registries were also searched for relevant trials. Any study examining the association between antibiotic administration following I&D of PA and incidence of fistula formation were included. Study eligibility, data extraction and risk of bias were independently assessed by two reviewers.

Heterogeneity was measured with a Q-test and with I² statistics. Data was pooled by using the random-effects model based on the heterogeneity test results and expressed as odds ratio (OR) with 95% confidence interval (CI). **Results:** A total of 5 studies (573 patients), 2 randomized controlled trials (RCT) and 3 observational studies, were included. Outcomes assessed included incidence of fistula formation (n=5) and adverse events (n=1). Representation to the ED and requirement for reoperation were not reported in any of the eligible studies. There was a significant and positive association between antibiotics and reduced fistula formation in 1 study (n=306) and negative association in 2 studies (n=169). Pooled estimate revealed no association between adjuvant antibiotics and fistula formation (OR: 0.85; 95% CI: 0.27-2.69), with a high degree of heterogeneity between studies (I²=82%). **Conclusions:** Review of available literature reveals no association between adjuvant antibiotics and development of perianal fistula following I&D, however the available data is limited and there is a high degree of heterogeneity between studies, limiting our ability to draw conclusions. Adequately powered, high quality, RCTs are necessary to establish if adjuvant antibiotics have the potential to reduce the incidence of fistula formation.

Presenter: Remington Winter

Presenter Contribution: Title and abstract screening Full text review screening Data extraction

PP53

Use of subcutaneous low-suction drains for the prevention of wound-related complications in obese renal transplant recipients

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Division of Urology

Domain: Clinical Research

Introduction and Objectives: Post-operative wound complications in the kidney transplant population are common and include infection, hematoma, lymphocele, dehiscence, and hernia. These complications are especially prevalent in patients with elevated body mass index (BMI) and contribute to longer hospital stays, higher readmission rates and return trips to the emergency department. Any intervention that may reduce the risk of wound complications is worth exploring. At TOH, some surgeons have started using extra-fascial, low-suction (Jackson-Pratt) drains in patients with elevated BMI as a prophylactic strategy. We set out to determine whether the placement of these drains at the time of kidney transplantation is protective against wound related complications in the post-operative period. **Methods:** A retrospective chart review of all patients who underwent renal transplantation at The Ottawa Hospital between January 1, 2016 and January 20, 2018 was conducted. Patient demographics, type and severity of complications and drain use were recorded. Multivariate regression analysis was performed to determine the relationship between drain use and the following outcomes: wound complications, prolonged length of stay (LOS), hospital readmission, and return to the emergency department. **Results:** A total of 183 patients were identified in the study, with an average age of 55 years. Sixty-seven (37%) patients were obese (BMI >30) or morbidly obese (BMI >40). There was no significant difference in age, gender or comorbidities between those who received a drain and those who did not. Drains were used in 50 individuals (27%), 32 (64%) of whom were obese or morbidly obese. Regression analysis indicated no significant effect of drain use on complication rate, hospital readmission, or presentation to the emergency department. There was a weak positive correlation between the use of drains and prolonged LOS in patients with BMI <30 (r, 0.159, p=0.04). **Conclusions:** We demonstrate, through a robust retrospective chart review, no significant benefit to using superficial incisional drains in overweight renal transplant recipients.

Presenter: Nikhile Mookerji

Presenter Contribution: Helped with protocol, REB, data collection and analysis.