Abstract #1 | Cardiothoracic | Clinical Science

TRANSCERVICAL EXTENDED MEDIASTINAL LYMPHADENECTOMY (TEMLA): SINGLE-CENTER EXPERIENCE AND NOVEL CLINICAL APPLICATIONS.
B Zhang, M Rao, A Bhargava, R Andrade, I Diaz Gutierrez

Background: Transcervical extended mediastinal lymphadenectomy (TEMLA) was first reported as a technique in 2005 as a staging technique for non-small cell lung cancer. It offers the most extensive technique of mediastinal lymph node biopsy or dissection. Key components include dissection of the brachiocephalic and both common carotid arteries, visualisation of both recurrent laryngeal nerves and elevation of the sternal manubrium using a table-mounted retractor. The range of dissection includes stations 1, 2R, 2L, 3a, 4R, 4L, 5, 6, 7 and 8.

Objective: Prospective studies have demonstrated superior accuracy with TEMLA compared to mediastinoscopy for lung cancer staging; however, very few centers have adopted this approach. We report our experience with TEMLA and describe alternative indications.

Methods: An institutional review board waiver was obtained for a review of all patients undergoing TEMLA at our institution from March 2013 to June 2018. Hospital records were analyzed for demographics, indications and complications. Operative reports were reviewed for associated procedures, operating times and blood loss.

Results: A total of 124 patients were evaluated (excluding 6 patients for incomplete records). The most common indication for TEMLA was lung cancer staging (n=82). We used the same technique for diagnosis of mediastinal adenopathy/mass (n=24), lymphadenectomy in transhiatal esophagectomy (n=8), drainage of mediastinal abscess (n=3) and thyroid cancer (n=1). Associated procedures included lobectomy (n=32), VATS wedge resection (n=3) and transcervical/subxiphoid wedge resection (n=9), esophagectomy (n=8), EBUS/EUS (n=3), pneumonectomy (n=3), sleeve resection (n=2), segmentectomy (n=2) and thymectomy (n=1). The complications of patients undergoing TEMLA without associated procedures (n=55) were recurrent laryngeal nerve injury 1.8%, atrial fibrillation 1.8%, hemorrhage 5.4%, pneumonia 5.4% and pneumothorax 1.8%. We had no mortality at 30 days. In 2 of 8 patients with TEMLA associated with esophagectomy we observed ischemic tracheitis without necrosis.

Conclusion: TEMLA is an underused surgical technique with diagnostic and therapeutic applications beyond lung cancer staging including transcervical lung wedge resection, access to mediastinum for mass resection and abscess drainage and thymectomy. We do not recommend using TEMLA in association with esophagectomy due to potential tracheal ischemia.
PATIENT-REPORTED QUALITY OF LIFE AFTER REDUCTION MAMMAPLASTY

E Taslakian, J Banuelos Mancilla, M Asaad, N Tran, M Nguyen, B Sharaf

Background: Women with macromastia often present with impaired quality of life due to chronic pain and reduced self-esteem. While many studies have assessed clinical and surgical outcomes of reduction mammoplasty, few have collected follow up information regarding psychosocial and functional outcomes from the patient perspective. Even fewer have explored the relationship between macromastia and sexual well-being, as well as changes after reduction.

Objective: This study examines patient-reported outcomes and quality of life following reduction mammoplasty at a single institution.

Methods: Female adult patients who underwent reduction mammoplasty from 2014 to 2018 at a single institution were recruited for this IRB approved study. Patients agreed to participate in a telephone interview consisting of 22 questions adapted from the BREAST-Q Reduction Module Postoperative Version regarding psychosocial well-being, sexual well-being, and satisfaction with outcome. A retrospective chart review was conducted to collect demographic information, body mass index (BMI), preoperative breast size, breast reduction technique, and complications. A total of 50 patients agreed to participate in the telephone interview.

Results: The mean age was 52 years (20-79) and mean BMI was 31.5 kg/m2 (24.8-44.4). Follow up time averaged 17 months (1.4-49). Pre-operative bra cup size was D or larger and 84% had ≥ grade 2 ptosis. Most cases (84%) were performed using the inferior pedicle technique. The mean amount of breast tissue removed was 682 grams (188-1710). The reported BREAST-Q scores were as follows: Satisfaction with Outcome 93, Psychosocial Well-Being 86, and Sexual Well-Being 68. Regarding specific outcomes, 96% of patients agreed that having surgery was the right decision for them, and 92% said they would encourage other women in their situation to have breast reduction. Patients with who reported lower scores on satisfaction with outcomes commented on excessive scar tissue, residual pain, or wanting smaller-sized breasts.

Conclusion: Reduction mammoplasty for symptomatic macromastia results in improved psychosocial well-being and is associated with an overall high satisfaction rating by patients. However, the sexual well-being rating (68) fell within the reported normative preoperative score for women with macromastia. Further prospective studies are necessary to elucidate the role of reduction mammoplasty in a patient’s quality of life, specifically sexual well-being, and to optimize meeting patient expectations and goals for the procedure.
IMPROVED ENGRAFTMENT OF HUMAN HEPATOCYTES IN IMMUNODEFICIENT, FAH-DEFICIENT PIGS
Erek Nelson, Dong Jin Joo, Shennen A. Mao, Jamie Glorioso, Raymond D. Hickey, Bruce Amiot, Piero Rinaldo, Eric Walters, Kristin Whitworth, Anna Spate, Melissa Samuel, Kevin Wells, Randall Prather, and Scott Nyberg

**Background:** Human hepatocytes are not yet available in abundance and high quality to meet the demand of patients with inherited liver diseases or from industry for development of new drugs and drug toxicity testing. A primary objective of our research program is to address these problems by large scale in vivo expansion of human hepatocytes in a porcine model of FAH deficiency, a model of hereditary tyrosinemia type-2. The livers of these pigs provide a selective advantage for engraftment and expansion of normal (FAH+) donor hepatocytes by causing death of native, diseased hepatocytes in the absence of the protective drug 2-(2-nitro-4-trifluoromethylbenzoyl)-1,3-cyclohexanedione (NTBC). Despite encouraging preliminary data in wild-type pigs and immunocompetent FAH-/- pigs, we have been unable to expand human hepatocytes in FAH-/- pigs using fetal tolerization alone. It now appears that genetic immunodeficiency, in combination with fetal tolerization, is required to fully eliminate the xenogeneic immune response of FAH-/- pigs to human hepatocytes. This is compatible with prior data in FAH-/- mice indicating that robust expansion of human hepatocytes required immunomodulation through multiple pathways.

**Objective:** We have previously shown that the livers of fumarylacetoacetate hydrolase (FAH) deficient pigs provide a selective advantage for engraftment and expansion of normal (FAH+) porcine donor hepatocytes. However, the host immune response against human donor cells blocks this advantage. We hypothesize that the knockout of recombinase activating gene-2 (RAG2) will produce an immunodeficient phenotype and may allow robust engraftment and expansion of human hepatocytes.

**Methods:** FAH/RAG2 knockout pigs were produced by zygote injection of CRISPRs targeting FAH. After embryo transfer and development to day 35, fibroblasts were obtained from an FAH-/- fetus and were transfected with a CRISPR guide targeting RAG2. The resulting FAH/RAG2-/- cells were used for somatic cell nuclear transfer, and embryos were transferred to surrogates. At day 40 of gestation, ten million human induced pluripotent stem cell-derived hepatocytes were injected into each fetal liver under ultrasound guidance. Piglets were delivered via Caesarian-section. Umbilical cord blood was obtained for quantification of human albumin via ELISA. Piglets were housed in a bioprotective facility. SCID and FAH-deficient phenotypes were confirmed by flow cytometry and immunohistochemistry of peripheral blood leukocytes and liver samples, respectively. The same protocol was performed on our previously described immunocompetent FAH-deficient pigs as control. Statistical comparison was performed with the Wilcoxon ranksum test.

**Results:** Seven litters were delivered in each group yielding 20 immunocompetent (RAG2+), FAH-deficient piglets (group 1) and 26 immunodeficient (RAG2-), FAH-deficient piglets (group 2). At birth, group 2 had a significantly greater circulating human concentration than group 1 (mean 166 vs 107 ng/ml, p = .004) (Fig. 1). In all piglets, elevated blood levels of tyrosine and succinylacetone were consistent with FAH deficiency.
Group 1 demonstrated an immunocompetent phenotype. Group 2 demonstrated an immunodeficient phenotype with variable growth curves and ubiquitous staphylococcal and pseudomonal skin infections. At necropsy, thymi were hypoplastic. Flow cytometry of peripheral blood leukocytes confirmed a T-cell (-), B-cell (-), and NK cell (reduced) immunodeficient phenotype. Immunohistochemistry of liver samples revealed no porcine FAH+ hepatocytes. The presence of the anticipated knockout sequences was reconfirmed on genotype.

**Conclusion:** We have produced a large animal model of a FAH/RAG2 double-knockout pig. FAH deficiency provides an intrinsic selective advantage for expansion of normal donor hepatocytes. RAG2 deficiency produces a tolerant state benefiting donor human hepatocyte engraftment as demonstrated by significantly increased production of human albumin at birth. This model may be suitable for future large scale expansion of human hepatocytes.

![Fig. 1: Cord blood human albumin concentration](image)

<table>
<thead>
<tr>
<th>Group 1 (Immunocompetent)</th>
<th>Group 2 (Immunodeficient)</th>
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<tr>
<td>N = 26</td>
<td>N = 20</td>
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<tr>
<td>Mean Rank = 16.98</td>
<td>Mean Rank = 28.52</td>
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<td>p = .004</td>
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CLINICAL DECISION SUPPORT INTERVENTION DECREASES TIME TO IMAGING IN ELDERLY PATIENTS WITH TRAUMATIC BRAIN INJURIES
B Thielen, S Yang, A Nguyen, R. M. Lorenzo, K Techar, C Berg, C Palmer, P Reicks, J Gipson, C Tignanelli

Background: Traumatic brain injury (TBI) is the leading cause of trauma admissions in the elderly. Our previous research identified each minute increase in time to TBI diagnosis is associated with a 2% increased mortality. Elderly patients who do not meet trauma activation criteria are vulnerable to receiving delayed diagnosis and treatment.

Objective: We developed a clinical decision support intervention (CDS-I) and TBI protocol to reduce time to imaging in elderly head trauma patients not meeting trauma activation criteria and assessed its effect on time to imaging.

Methods: An emergency department (ED) head computed tomography (CT) protocol and radiology technician CDS-I was developed, disseminated, and implemented in September, 2018 to facilitate rapid imaging and triage of elderly patients following head trauma. All elderly (>/>=70 years old) or anticoagulated patients who suffered head trauma and did not meet full or partial trauma team activation criteria were included. Our primary outcome was time from ED arrival to completion of head CT imaging before (1/1/2018-8/1/2018) versus after (9/4/2018–11/30/2018) protocol implementation.

Results: 132 patients received the intervention. Implementation of the CDS-I resulted in a decrease of time from ED arrival to start of head CT from 85 to 41 minutes (51.7%). 12.1% of the total number of patients who received the intervention had a positive CT (7 grade-1, 5 grade-2, 2 grade-3, 2 grade-5 TBI).

Conclusion: 12% of elderly or anticoagulated patients not meeting activation criteria have positive CT findings. CDS-I and rapid triage protocols reduce time to imaging in these patients nearly 50%.
FLAP RECONSTRUCTION FOR ABDOMINOPERINEAL RESECTION WITH SACRECTOMY: OUTCOMES AND COMPLICATIONS OVER A 20-YEAR PERIOD
A Rajesh, M Asaad, K Bakri, M Houdek, E Dozois, N Tran, O Manrique

Background: Abdominoperineal resection (APR) is a radical procedure commonly performed for advanced and recurrent pelvic malignancies. Sacrectomy in the setting of an APR is often accomplished between a combined APR and posterior approach for a high-level sacrectomy (above the S2/S3 disc) or APR alone for lower sacral resections. The outcomes of patients who undergo flap reconstruction for APR with sacrectomy (APRS) have not been extensively analyzed.

Objective: To report the outcomes and complications in patients who undergo abdominoperineal resection with sacrectomy

Methods: A retrospective review was conducted to identify all patients who underwent flap reconstruction for abdominoperineal resection with sacrectomy over a 20-year period (from 1999 to 2018). Sacrectomy above the level of the S2-S3 disc was considered high sacrectomy and sacrectomy at the level of S3 or below was considered low sacrectomy. Major and minor complications in abdominal and perineal wounds were recorded. Statistical analysis was performed using Fisher’s exact test for categorical variables and unpaired t-test for continuous variables (p<0.05 was considered statistically significant).

Results: Over a twenty-year period, a total of 46 patients underwent flap reconstruction for APRS. The median age of our patient cohort was 57 years (Inter Quartile Range of 49-64) with a median follow-up of 17 months (Interquartile range, 7-45). 28 patients (60%) underwent this procedure for colorectal cancer while 8 patients (17%) had been diagnosed with sacral chordoma. 39% (n=18) underwent APRS for primary disease and 61% (n=28) underwent the procedure for recurrent cancer (26 recurrent rectal cancer, 1 recurrent uterine cancer, and 1 recurrent sacral anaplastic meningioma). Six patients of our total patient cohort (13%) underwent pelvic exenteration along with the APRS. Rectus abdominis muscle flap (RAM) was used as the reconstructive option in 42 patients (91%), while other flaps (2 Gluteal, 2 anterior thigh flaps) were used in the rest of the patients. Half of our cohort (n=23) had a major perineal complication (Table 1). When comparing complications in the RAM group to the other flaps group, no significant differences were found in major or minor perineal or abdominal wall complications. APR with high-sacrectomy was performed in 27 patients (59%) and was associated with significantly increased full thickness dehiscence in the perineal region when compared to APR with low sacrectomy, 33% vs. 0% respectively (p=0.0076).

Conclusion: Based on this analysis, the RAM flap, was the workhorse flap for pelvic reconstruction after APRS. Due to the high morbidity and complexity of these procedures, for patients who undergo larger resections, close wound surveillance and postoperative wound care protocols can be beneficial in order to reduce complications.
<table>
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<th>Complications</th>
<th>N (%)</th>
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<tr>
<td><strong>Major perineal complications</strong></td>
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<td>Infection</td>
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<tr>
<td>Abscess</td>
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<tr>
<td>Necrosis</td>
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<td>Full thickness dehiscence</td>
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<td>Delayed wound healing</td>
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<td>Flap loss</td>
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<td><strong>Patients with any complication</strong></td>
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<td><strong>Major abdominal complications</strong></td>
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<td><strong>Patients with any complication</strong></td>
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LAPAROSCOPIC TRANSGASTRIC ESOPHAGEAL MUCOSECTOMY (LTEM); FROM A PORCINE MODEL TO A HUMAN PATIENT.
R Heneghan, I Diaz-Gutierrez, O Alsaied, N Rueth, D Leslie, E Racila, S Mallery, R Andrade.

**Background:** Standard of care for patients with Barrett's esophagus (BE) and confirmed high grade dysplasia (HGD) should undergo endoscopic therapy when possible as opposed to resection. Two patient subgroups pose a difficult challenge; first, lesions at the GEJ are difficult to resect endoscopically and second, multifocal high grade dysplasia requires long-segment resection which is technically challenging and associated with high stricture rate.

**Objective:** We sought to determine the feasibility and safety of laparoscopic transgastric esophageal mucosectomy (LTEM) for circumferential, long-segment esophageal mucosectomy, while preventing stricture formation with prophylactic stent placement.

**Methods:** We first performed LTEM in 5 pigs; then, we applied our technique in 1 human and prepared a case report.

In our porcine model, we performed esophagogastrectomy at 60 days. For our human patient, we removed the stent at 6 weeks and performed endoscopic biopsy every 3 months.

**Technique:** We placed 1 umbilical port and 3 balloon-tipped ports in the upper abdomen, advanced the ports into the stomach and insufflated (10 mm Hg). We elevated the gastric mucosa with saline injection, incised it circumferentially 1 cm distal to the Z-line, and dissected submucosally to 5 cm proximal to the Z-line. We transected the mucosa, removed it en bloc and placed an esophageal stent.

**Results:** Of the 5 pigs, 1 died intraoperatively (acidosis). Of the remaining 4 pigs, 3 (75%) experienced stent migration requiring repositioning. Moreover, 3 (75%) had complete reepithelialization without stenosis; in contrast, 1 (25%) developed ulceration with 30% to 40% stenosis. Our human patient had complete reepithelialization at 6 weeks without stenosis. Pathologic analysis showed adenocarcinoma with submucosal invasion and negative margins. Surveillance biopsies were negative at 1 year.

**Conclusion:** In our porcine model, LTEM removed long segments (> 5 cm) of en bloc circumferential esophageal mucosa and proximal gastric mucosa; stenting appeared to reduce stricture formation. The potential clinical role of LTEM remains to be defined.
PROPHYLACTIC PREOPERATIVE PLATELET TRANSFUSION FOR THROMBOCYTOPENIC Pediatric PATIENTS LEADS TO HIGHER POSTOPERATIVE PLATELET TRANSFUSION VOLUMES WITHOUT REDUCED RISK OF BLEEDING

Tatiana de Warren, Melanie LaPlant, Daniel Saltzman, Donavon Hess

Background: Thrombocytopenia is prevalent in critically ill pediatric patients where surgical intervention is often indicated. Preoperatively, providers may attempt prophylactic transfusion to prevent bleeding complications. However, it may be difficult to achieve a predetermined platelet level due to a high level of refractoriness leading to multiple transfusions. Transfusions are associated with several adverse effects.

Objective: We hypothesize that patients who do not undergo preoperative platelet transfusion will have lower platelet transfusion volumes without any associated risk of a bleeding complication.

Methods: We reviewed records (2011 – 2016) for pediatric general surgery patients at our tertiary referral children’s hospital. We included patients with a platelet level below 50 x10^6 mL, excluding patients with necrotizing enterocolitis (n = 49). We compared four-week post-operative platelet transfusion levels using Student’s t test and multivariate linear regression.

Results: No patient had a postoperative bleeding complication. Patients that were not preoperatively transfused (n = 11) had a combined operative and postoperative platelet volume of 36.0 mL/kg, compared to 102.4 mL/kg (0.007), with 13 fewer donor exposures (p < 0.001). There was a 3.8 mL/kg increase in postoperative platelet transfusion volume for every 1 mL/kg increase in preoperative platelet transfusion volume (p < 0.001) and a 2.7 mL/kg increase for every resulted platelet level test (p 0.002). Further, among patients that had a platelet test resulted following preoperative transfusion (n = 30) we found that there was not a significant association between transfusion volume (mL/kg) and change in platelet level (mL), (β, 0.97; SE, 1.19; p 0.425).

Conclusion: At our institution, we found that abstaining from pre-operative platelet transfusion for thrombocytopenic patients did not lead to an increased risk of bleeding complication. Instead, we found that these patients experienced fewer transfusions and donor exposures up to four weeks post-operative.

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Scatter Plot of Change in Platelet Level (mL) and Platelet Transfusion Volume (mL/kg) with a Univariate Linear Regression Line
WHAT DO FORMER PRELIMS SAY ABOUT THEIR 1 YEAR OF GENERAL SURGERY TRAINING?
A Rajesh, M Asaad, A Chandra, C Backstrom, D Farley

**Background:** The non-designated preliminary (NDP) position in General Surgery offers one-year of surgical training as an opportunity for medical school graduates to showcase their commitment and skills as they seek categorical residency positions. A national level study analyzing the differences in training satisfaction among preliminary and categorical residents reported lower collegiality and satisfaction with operative experience among the NDP cohort. We are unaware of any long term follow-up of former NDP graduates that provides feedback on their one-year experience.

**Objective:** We aimed to evaluate the positive and negative experiences of our NDP graduates from 1993-2018.

**Methods:** A list of all 315 NDP interns over a 25-year period in our program was compiled and used to identify and connect with individuals through internet searches (Doximity, LinkedIn, etc.) and personal communication (alumni office, program coordinators, etc.). A 14-question survey was emailed to these individuals.

**Results:** Of 315 NDP interns spending one year with us, we were able to find the whereabouts of 296 (94%). 119 (40%) former NDP interns responded to our survey. While 71% (n=85) of participants reported that their NDP year gave them a “Strong” foundation for their future career, most respondents felt that the training year was stressful and suggested increased mentoring and support for preliminary residents as an area for potential improvement at our institution. The experiences of our NDP graduates are depicted in the graphs. 82% (n=97) of respondents stated that, if given the choice again, they would redo their preliminary year. Of these 97 individuals, 53% (n=52) responded that they would do this because it helped them match into their preferred specialty. 60% (n=70) of participants stated that they might have preferred a categorical position at a smaller institution. 62% (n=72) respondents told us that they applied solely to General Surgery in their first NRMP Match (the one they matched with us as a NDP). 38% of respondents (n=46) reported fewer interviews and 26% (n=31) reported the same number of interviews offered when applying to the Match as a PGY1 prelim resident. As NDPs, 59% (n=70) pursued General Surgery for their 2nd match.

**Conclusion:** Pursuing the NDP year is difficult given the looming uncertainty and pressure to perform well. While the vast majority of NDPs obtained a categorical residency spot following their one year of training, feedback from this survey using 25 years of experience suggests that we should bolster our mentorship, support, and assistance to NDPs.
HUNGRY FOR HAIR: LESSONS IN THE MANAGEMENT OF TRICHOBEZOARS
A Chandra, C Backstrom, A Rajesh, N Shaikh, D Farley

Gastrointestinal (GI) bezoars are the most common foreign bodies that cause an obstruction in the GI tract. Trichobezoars are composed of hair and are often associated with underlying psychiatric illnesses and trichotillomania. The diagnosis is rarely straightforward as most patients are not forthcoming about trichophagia. Such bezoars remain asymptomatic for several years till they are large enough to present with intestinal obstruction and an abdominal mass.

We present our experience with a recurrent massive trichobezoar which presented as an epigastric mass and discuss the complications experienced in management.

A 15 year old female presented to our institution for a routine sports physical and was found to have a large epigastric mass. On further questioning she reported halitosis and early satiety without nausea, vomiting, weight loss, or changes in bowel habits. Her past surgical history was insignificant. However, her past medical history was significant for adjustment disorder and admission to the psychiatric unit. Her family history was significant for psychiatric illness in her mother.

The patient appeared healthy with a BMI of 21 and was above the 60th percentile for stature and weight. Physical exam revealed a palpable, large, non-tender, smooth, and freely mobile epigastric mass. The rest of the abdominal exam was unremarkable. A plain x-ray of the abdomen showed marked gastric distension. Further diagnostic imaging with a computed tomography (CT) confirmed a mass occupying the stomach without any extension through the pylorus. On further questioning, the patient admitted to trichophagia. This gastric mass was thus preoperatively diagnosed as a trichobezoar.

As the mass was asymptomatic, she was initially managed with observation alone. This included eating frequent small meals and drinking moderate amount of carbonated soft drinks in an attempt to stimulate gastric contraction to expel the bezoar into the GI-tract. Behavioral psychotherapy was involved to dissuade any further trichophagia. At the 1 month follow up, there was no change in the size of the bezoar on X-ray and endoscopic intervention was attempted. Multiple attempts were made to remove the mass endoscopically, but they failed due to the size and density. We proceeded with a laparotomy though an upper-midline incision. A gastrotomy was made and the trichobezoar mass was visualized. The firmness of the mass resulted in the breaking of a surgical clamp following which we used a perforating clamp. The bezoar measured 17cm x 12cm x 1cm (Fig. 1A) and was evacuated through an anterior gastrotomy. The gastrotomy was closed with an inner layer of running vicryl and outer layer of interrupted silk.

The patient had an uneventful post-operative recovery. On discharge, she continued behavioral psychotherapy and remained symptom free at 6 months follow-up. Ten years later, she again presented with an epigastric mass and features suggestive of gastric obstruction. She admitted to continued trichophagia after completion of her psychiatric treatment. Abdominal CT was similar to that of her initial presentation. We proceeded directly to laparotomy and successfully extracted her second trichobezoar (Fig. 1B-D).
Bezoars are collections or concentrations of foreign bodies retained in the GI tract. Such masses are rare and can cause variable and nonspecific symptoms. As such, they are often found incidentally on imaging, endoscopy, or physical exam. Trichobezoars, comprised of swallowed hair, constitutes less than 6% of all bezoars. While often proximal to the pylorus, some large trichobezoars have been known to extend into the duodenum, known as Rapunzel syndrome.

The gastric anatomy and physiology plays a key role in forming trichobezoars. Human hair is resistant to digestion as peristalsis has limited effect on smooth surfaces. The pyloric valve contributes to the accumulation of hair by not allowing easy passage through the pylorus. With time and accumulation of hair, a mass takes the shape of the gastric cavity causing symptoms of fullness/obstruction.

Management must include psychiatric evaluation prior to definitive intervention. Carbonated beverages are often recommended as a means to stimulate gastric contractions. Size and density of these masses limit success with endoscopic fragmentation and run the risk of distal migration of fragments, precipitating intestinal obstruction. Laparoscopic extraction is becoming commonplace and has been found to be associated with significantly reduced operative time, postoperative complication rates and hospital stay. However, laparotomy is often resorted to especially in cases of massive bezoars which may not allow for a minimally invasive approach. Psychiatric referral and counselling is of paramount importance in patients with trichotillomania and trichophagia. Trichobezoars are rare, but should be within a broad differential of diagnoses in young patients with psychiatric comorbidities presenting with an abdominal mass or features of obstruction. Cognizance of behaviors such as trichophagia, is key to elucidating the nature of such masses seen on imaging. It is also important for such patients to have regular psychiatric follow-ups to prevent a return of trichophagia. Surgeons need to be aware of the nature of the mass in question, recognizing that the density and size of bezoars can alter planned management.
URGENT RADICAL THYMECTOMY FOR MORVAN SYNDROME.

A Wafi, I Diaz-Gutierrez, M Rao, A Bhargava, R Andrade.

Morvan syndrome is a rare disorder with only 27 case reports in the English literature, consisting of peripheral nerve hyperexcitability, autonomic dysfunction, and central nervous system (CNS) symptoms. Severe insomnia and sleep disturbance (present in 86% of patients) is similar to that described in delirium tremens and fatal familial insomnia. Morvan syndrome is considered to be an autoimmune disorder and antibodies against voltage-gated potassium channels are found in most cases. Thymoma is found in approximately 50% of cases and thymectomy could be curative.

A 65 year-old male patient previously healthy and very active, presented with a constellation of symptoms including severe insomnia, confusion, frequent falls, night sweats, hallucinations, hyponatremia, tremor and weight loss. Electromyography, CSF and serum testing were consistent with Morvan syndrome with positive Anti-VGKC/CASPR2 antibodies. Chest CT scan revealed a 5 cm calcified thymoma. He failed medical therapy including steroids, IVIG and plasmapheresis with rapid worsening of symptomatology. He underwent an urgent radical thymectomy through a median sternotomy, with partial resection of the innominate vein and en bloc resection of right upper lobe lung wedge. His postoperative course was complicated with a prolonged hospital stay due to persistent agitation, although his symptoms significantly improved with resolution of insomnia. He had no procedure related complications.

We described a case of a thymoma associated to Morvan syndrome refractory to medical therapy that showed significant improvement in symptomatology after radical thymectomy. Pathology revealed sclerosing thymoma, pT2NX, stage IIb, R0 resection.

In Morvan syndrome, the sleep disturbance is so severe that causes progressive degeneration of the thalamus that can be fatal if untreated. Thymectomy becomes a relative urgent procedure when there is no response to conventional medical therapy. Urgent thymectomy for Morvan syndrome should be considered a therapeutic option when refractory to medical therapy. Delaying surgery may cause permanent neurologic impairment secondary to severe insomnia.
DO PATIENTS' EXPECTATIONS OF GENDERED COMMUNICATION UNFAIRLY DISADVANTAGE FEMALE SURGEONS?
CF Branson, MC Bobel, ME Brunsvold, JG Chipman

**Background:** Physician communication is linked to patient satisfaction. While patients prefer affective communication, surgeons tend to use informative and directive communication. In our society, women more than men, are socialized to use affective communication. Thus, female surgeons may be disadvantaged if they adopt the typical surgeon communication style because it is not the style that patients expect.

**Objective:** We hypothesize that female surgeons are perceived more negatively than male surgeons for lacking affective communication when rated by standardized patients (SPs) and faculty in an Objective Structured Clinical Examination (OSCE).

**Methods:** Eight OSCE videos of surgical trainees delivering bad news to SPs were scored by faculty. The performances of three low-scoring women were compared with the performances of the top two men and women. Using Discourse Analysis (DA), we counted the frequency of patterns of affective, informative, and directive communication. DA is a qualitative methodology where language is examined to discover meaning.

**Results:** Of the three lowest-scoring female surgeons, two used an informative and directive style. The male surgeon who used the same style scored more than 15 points higher than those female surgeons. The highest scoring female surgeon’s communication was affective while the highest scoring male surgeon’s communication was informative and directive.

**Conclusion:** Female surgeons using a typical surgeon communication style scored significantly lower than their male counterparts in an OSCE. This has implications for surgical graduate medical education leaders who socialize residents in patient communication because typical surgeon communication may unintentionally cause female surgeons to be perceived negatively by patients.
Background: Epidemiologic assessment of admissions into Surgical Intensive Care Units (SICUs) provides a framework to evaluate healthcare systems efficiency and project future healthcare needs.

Objective: We sought to evaluate temporal trends in admission rates, mortality, length of stay (LOS) and change in functional status (FS) within surgical ICU’s using a national outcomes database.

Methods: We performed a 9-year, US population-based analysis of all adult admissions from 238 SICU’s using the prospectively and manually abstracted, Cerner Apache Outcomes database. We stratified patients into 11 epidemiological cohorts and modeled temporal trends in admission, mortality, ICU LOS and change in FS using mixed-effects with hospital-level random intercepts, and quasipoisson models, to obtain risk-adjusted outcomes.

Results: We evaluated 78,054 SICU admissions and observed a significant decrease in transplant and thoracic surgery admissions, with a concomitant increase in ENT and facial reconstructive surgical admissions (p < 0.05, Figure-1A). While overall risk-adjusted mortality following SICU admissions remained stable over the study period (Figure-1B); orthopedic, cardiac, urologic, and neurosurgical mortality declined significantly (p < 0.05). Overall ICU-LOS decreased. Cardiac, urologic, gastrointestinal, neurosurgical, and orthopedic admissions noted significant reduction in LOS (p < 0.05, Figure-1C). The rate of FS deterioration increased per year, suggesting ICU-related disability increased over the study period (Figure-1D).

Conclusion: Temporal analysis demonstrates a significant change among SICU admissions over the last decade, with decreasing mortality, LOS, and increasing rate of FS deterioration within certain surgical cohorts. Improvement in SICU outcomes may highlight successful quality-improvement initiatives within certain surgical cohorts, while simultaneously identifying cohorts that may benefit from future intervention. Our findings have significant implications in healthcare systems planning including resource and personnel-allocation, education, and surgical training.

Graph on next page
Figure 1A: Incidence Rate Ratio and 95% CI Estimates presented for the fixed year term in each separate negative binomial mixed effect model, all models adjusted for age, gender, and race. *Did not converge

Figure 1B: Mortality Rate Ratio and 95% CI Estimates presented for the fixed year term in each separate negative binomial mixed effect model, all models adjusted for age and acuity score. *Did not converge

Figure 1D: Functional Status Change Incidence Rate Ratio and 95% CI Estimates presented for the fixed year term in each separate quasipoisson model, all models adjusted for age, gender, race and acuity score.

Figure 1C: ICU Length of Stay Length of Stay (days) with 95% CI Estimates presented for the fixed year term in each separate linear mixed effect model, all models adjusted for age, gender, race and acuity score.
EFFICACY OF ENDOVASCULAR APPROACH FOR PEDIATRIC TRAUMATIC THORACIC AORTA INJURIES
Tatiana de Warren, Melanie LaPlant, Daniel Saltzman, Donavon Hess

**Background:** Traumatic thoracic aortic injuries are relatively rare within the pediatric population as it only occurs in 0.06% to 0.1% of patients. Although they occur infrequently, these injuries contribute to 2.1% of pediatric trauma related deaths. Thoracic aortic injuries are most frequently due to high energy, blunt trauma with motor vehicle accidents and falls being the most common mechanisms. Endovascular repair of traumatic aortic injuries has become more common in the adult population where it has demonstrated a survival benefit and decreased morbidities in comparison to an open approach. In a previous study of all types of arterial injuries in pediatric trauma patients, there was no mortality difference between endovascular and open approaches.

**Objective:** We aim to compare outcomes between endovascular and open management specifically of traumatic thoracic aortic injuries in pediatric patients.

**Methods:** We selected records from the National Trauma Databank, years 2010 – 2016. Included in analysis were all patients, aged 1 to 18 years, with a thoracic aorta injury who had endovascular repair (n = 92) or open repair (n = 93). We compared hospital mortality by treatment approach using fisher’s exact test and logistic regression, adjusting for patient demographics, injury severity, injury type, facility type, and facility clustering.

**Results:** Patients ranged in age from three to 17 years (mean 15; SD 2.8). Injury severity scores ranged from 16 to 75 (mean 37; SD 15.0), and 85% of injuries were blunt. The mortality rate for patients who underwent endovascular repair was 6.5%, compared to 30.1% for patients that underwent open repair (p < .001). The mortality odds remained significantly higher for open approach patients after adjusting for patient and facility characteristics (AOR 5.89; 95% CI 1.32 – 26.28; p .021).

**Conclusion:** Endovascular interventions are significantly more common in the management of trauma patients, but require further evaluation in pediatric patients. In the management of thoracic aortic injuries, the mortality rate was significantly higher in patients who underwent open repair. After adjusting for patient and facility characteristics, the mortality odds remained significantly higher for patients undergoing an open approach. The use of endovascular approach for thoracic aorta repair appears to be efficacious and beneficial in pediatric patients. As endovascular therapy becomes widely available, it is important to characterize further the populations and types of injuries that will benefit from this approach.

*Graph on next page*
OUTCOMES OF CRANIAL RECONSTRUCTION IN PEDIATRIC PATIENTS
Malke Asaad, MD, Editt N. Taslakian, MS, Joseph T. Banuelos Mancilla, MD, Uldis Bite, MD, Basel A. Sharaf, MD, DDS

Background: Limited data exists regarding the different materials used in pediatric cranioplasty and consensus is lacking regarding the best material for cranioplasty in growing patients.

Objective: The purpose of this study is to report our institution's surgical and patient-reported outcomes in pediatric cranioplasty.

Methods: A retrospective review of all pediatric patients who underwent cranioplasty at our institution from 2005 to 2017 was conducted. Patients were included if they were younger than 18 years of age and underwent cranioplasty with autologous or alloplastic material for full-thickness cranial defects. Patients were excluded if they had craniosynostosis or cranioplasty for contouring with no full-thickness defect. Patient demographics, outcomes, and complications were abstracted and analyzed. Patient-reported outcomes were subsequently collected via telephone survey. This study was approved by our institutional review board.

Results: A total of 39 cranial reconstructions (32 patients) met our inclusion criteria. Patients had a median age of 7 years and the median follow-up was 4.7 years (IQR 2.3-6.3). The median defect size was 48cm² (IQR 18-120). Cranial trauma was the most common etiology for cranioplasty (23%) followed by infection (18%) and resorption of previously placed bone flap (15%). The most common material used was PEEK in 13 patients (33%), followed by PMMA in 11 patients (28%), Titanium in 9 patients (23%), and autologous bone in 6 patients (15%).

Autologous bone was used in younger children (median age 19 months), when compared to PEEK (9 years), Titanium (9 years), and PMMA (7 years). Median defect size in the PEEK group (126cm²) was higher than Titanium (78cm²) and PMMA (30cm²). PEEK was the choice of reconstruction in 9 of the 13 patients that had previous cranioplasty. The overall complication rate was 18% and cranioplasty failure occurred in 13%. Infection rate was 5% and wound dehiscence 8%. No significant differences in complication rate were found between Alloplastic and Autologous reconstruction (p=0.5679). PEEK showed higher complication rates (31%) when compared to Titanium (22%) and PMMA (9%). Graft failure was also higher in the PEEK group (23%) when compared to Titanium (11%) and PMMA (9%). However, none of these differences reached statistical significance.

A total of 7 patients (5 PEEK, 1Titanium, 1 PMMA) responded to a telephone survey for patient-reported outcomes. None of the patients interviewed experienced further complications related to their cranioplasty reconstruction. On a scale from 1 to 6 (where 1 is poor and 6 is excellent), patient reported an average satisfaction with the reconstruction of 5 (good). Fifty percent of the patients (all PEEK) are able to perceive the implant by palpation and notice the implant when looking in the mirror. Out of the 7 patients, 2 patients reported the need for future surgeries to correct the area of deformity.
**Conclusion:** Cranial reconstruction is associated with high satisfaction among patients. Although PEEK was associated with higher complications and implant failures, this may be due to larger defect sizes and a history of prior cranioplasty. Larger studies are needed to demonstrate the difference in outcomes between cranioplasty materials in pediatric patients.
CONTRASTING PREFERENCES FOR GENDER AFFIRMING SURGERY BETWEEN TRANSGENDER AND GENDER NON-BINARY INDIVIDUALS: AN ANALYSIS OF THE 2015 USTS DATABASE.
Eugene Zheng, BA; Victor Vakayil, MBBS, MS, MPH; Marie Claire Buckley, MD; Umar Choudry, MD; Nicholas Kim, MD.

Background: Most transgender people identify within a binary gender framework. Gender non-binary individuals, however, do not fit into dichotomous labels such as “man” or “woman.” They have a gender that is a blend of masculinity and femininity, or neither at all. Despite this wide spectrum of gender identity, surgery for gender transition remain in a binary framework. The expectation that such procedures can treat all variants of gender dysphoria may be inappropriate.

Objective: Characterize the surgical desires and identify socio-economic factors that affect the surgical transition of gender non-binary individuals will help improve their care.

Methods: We abstracted data using the 2015 United States Transgender Survey dataset, which included >27,700 respondents from all 50 states. Based on sex-assigned-at-birth and reported gender, we stratified respondents into transwoman (MtF), transman (FtM), non-binary: assigned male at birth (MtN), and non-binary: assigned female at birth (FtN). Using univariate techniques, we compared demographic, baseline clinical, and socioeconomic variables. Additionally, we sub-stratified all gender non-binary individuals into those who received and did not receive surgery, and constructed logistic regression models to identify socio-economic factors associated with surgical transitioning.

Results: We queried a total of 26,957 respondents; 9,769 (36.2%) identified as non-binary [FtN =7,844 (29.1%) and MtN = 1,925 (7.1%)] and 17,188 (63.8%) identified as transgender [MtF = 9,238 (34.2%) and FtM = 7,950 (29.5%)]. Compared to transgender persons, non-binary individuals were less likely to receive hormonal therapy [trans=11,794 (68.6%) vs. non-binary=1,249 (12.8%), P <0.001], psychotherapy [trans=12,571 (73.1%) vs. non-binary=2,980 (30.5%), P <0.001], and were less likely to surgically transition [trans=5,017 (30.1%) vs non-binary=712 (7.2%), P <0.001]. Among the non-binary population, FtN were more likely to surgically transition compared to MtN [FtN=611 (7.9%) vs MtN=101 (5.4%), P <0.001]. Mastectomies (N=3,729, 47.6%) and hysterectomies (N=2,637, 33.6%) were the most desired procedures by FtN; significantly lower than those requested by FtM, where mastectomies (7,640, 96.1%), hysterectomies (5,508, 69.2%) and metoidioplasties (2,063, 26%) were the most desired (all P's<0.001). Among the MtN population, facial feminization surgery (400, 20.8%), orchiectomies (325, 16.9%), and augmentation mammoplasties (308, 16%) were the most desired surgical procedures. Surgical transition was significantly lower (P<0.001) among MtN individuals versus MtF individuals, where vaginoplasties (6,156, 66.7%), orchiectomies (5,299, 57.4%), and facial feminization surgery (4,447, 48.2%) were the most desired. Compared to transgender persons, non-binary individuals were more likely to have higher rates of psychological distress [trans=5,879 (34.2%) vs non-binary= 4,607 (47.2%), P <0.001] and were more likely to have de-transitioned in the past [trans=1,350 (7.8%) vs non-binary= 2,708 (27.8%), P <0.001]. Multivariate modeling demonstrated increasing age, female sex assigned at birth, increased education status,
presence of health insurance, and receiving psychological counseling and therapy to be associated with increased rates of surgical transitioning among nonbinary respondents.

**Conclusion:** Gender non-binary people constitute a significant group within the gender nonconforming community. In contrast to transgender people, they are less likely to have surgically transitioned and they also place less importance on genital surgery. Additionally, we demonstrate the effect of various modifiable socio-economic drivers surrounding variable rates of their surgical transitioning.
Abstract #16 | Education | Education Science

A NOVEL SIMULATION-BASED SELECTION PROCESS FOR IDENTIFYING AN OUTSTANDING GENERAL SURGERY RESIDENTS
Y. AlJamal, H. Saleem, N. Prabhakar, T. McKenzie, J. Stulak,

**Background:** Selecting the right applicants is one of the most critical and difficult processes a surgical program has to go through. We sought to create a novel selection process in identifying high quality general surgery residents using a pre-interview preparation package and simulation-based assessments.

**Objective:** All 60 applicants that accepted an interview for general Surgery at Mayo Clinic, Rochester MN were mailed a package of educational supplies. The package included a formal letter from the program director, a link to instructional videos, surgical instruments and low-cost models for 5 different tasks (suturing, open knot tying, adrenal anatomy knowledge, reading Chest X-rays and interpreting ABGs). During the interview day, the applicants participated in 48-minute simulation-based assessment consisting of the same 5 tasks. Post-assessment all applicants were surveyed anonymously. Results of this assessment were then used to rank applicants. Interns who successfully matched through the NRMP (2018 class) had their performance compared to previous years through annual multistations assessment known as the Surgical Olympics and the in house ABSITE preparation test.

**Methods:** Sixty 4th year medical students accepting an interview for our categorical general surgery residency program were mailed a package of educational supplies. The package included a link to instructional videos, surgical instruments and low-cost models for 3 different tasks (suturing, open knot tying, and adrenal anatomy knowledge). During the interview day, applicants participated in a 48-minute simulation-based assessment consisting of 5 tasks: the same 3 tasks above, as well as reading Chest X-rays and interpreting ABGs; performance scores (A-F) on these tasks were used to assist in ranking applicants. Post-assessment, all applicants were surveyed anonymously. The matched 2018 class subsequently was compared to our previous intern classes on several objective assessments (Surgical Olympics, pre-ABSITE test and ABSITE score).

**Results:** Simulation scores did affect our ranking of applicants. Students scoring an A or B were moved higher in our final rank list. Our 10 matched categorical residents scored an A=7, B=2, C=1. The program matched all candidates at a similar rank to previous years. Thirty-seven applicants (62%) responded the survey. 32 (87%) applicants felt the information they received prior to the interview was sufficient, and 100% felt that they had a good sense of our program had to offer them. The 2018 intern class scored significantly higher in 10 of 15 stations compared to our 2015-17 class (Table 1) with no significant difference on our in-house pre-ABSITE exam (2018 class: 55% (+/-8%) vs 2016-17 class: 52% (+/-8%); p=0.1).

**Conclusion:** By mailing out a pre-interview welcome package and adding a simulation based assessment to our General Surgery categorical interview process, we believe early objective data suggests we positively influenced our 2018 NRMP match.

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<table>
<thead>
<tr>
<th></th>
<th>Reading Chest X-ray</th>
<th>2018 (10 interns)</th>
<th>2015-2017 (30 interns)</th>
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<tr>
<td>1</td>
<td></td>
<td>8 (1.2)</td>
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<td>2</td>
<td>Interpreting ABGs</td>
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<td>3</td>
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<td>4</td>
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<td>119.7 (49)</td>
<td>219.6 (121.6)</td>
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<td>5</td>
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<td>100.7 (35)</td>
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<td>6</td>
<td>Suturing (Max 10pts)</td>
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<td>6.7 (2.2)</td>
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<td>7</td>
<td>ICU Knowledge</td>
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<td>12 (3.4)</td>
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<td>9</td>
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<td>4.7 (2.8)</td>
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<td>10</td>
<td>FLS* Intracorporeal knot tying (sec)</td>
<td>176 (68)</td>
<td>192 (77)</td>
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<tr>
<td>11</td>
<td>FLS* Circle cutting (sec)</td>
<td>148 (35)</td>
<td>163 (52)</td>
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<td>80 (20)</td>
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<td>13</td>
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<td>14</td>
<td>Fascia closure (Max 25pts)</td>
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<td>Video commentary (Max 200pts)</td>
<td>60 (14)</td>
<td>36 (21)</td>
<td>0.001</td>
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*FLS: Fundamentals of Laparoscopic Skills
Abstract #17 | Trauma | Clinical Science

PAPER [ORDER]: [TIME] PREDICTORS OF ELDERLY MORTALITY AFTER TRAUMA: A NOVEL OUTCOME SCORE
Rachel S. Morris MD, David Milia MD, James K. Glover MS, Erich Kummerfeld PhD, Mark R. Hemmila MD, Lena M. Napolitano MD, Jeffrey Chipman MD, Deborah Stein MD, Christopher J. Tignanelli MD

Background: Elderly trauma patients are at higher risk for mortality, even when presenting with minor injuries. Previous prognostic models, e.g. Geriatric Trauma Outcome score (GTO), for geriatric mortality are poorly utilized due to their reliance on the injury severity score (ISS) which is not available prior to injury coding.

Objective: The purpose of this study was to develop a novel scoring method to predict in-hospital mortality using easily available metrics to facilitate goals of care.

Methods: The National Trauma Databank (NTDB) was used to identify patients 65+ years. Data was dichotomized into training (2007-2013) and validation (2014-2015) datasets. There was no overlap between datasets. Factors included age, co-morbidities, physiologic parameters, and injury types. A two-tiered scoring system to predict in-hospital mortality was developed: a quick elderly mortality after trauma (qEMAT) score for use within the 1st hour of presentation and a full EMAT (fEMAT) for use at tertiary examination. Multiple stepwise selection methods were tested using both Akaike information criterion (AIC) and p-value thresholds for factor selection. The final model (stepwise forward-selection, p<0.05) was selected based on calibration and discrimination analysis. Calibration (Brier score) and discrimination (AuROC) were then evaluated in the validation dataset. As NTDB did not include transfusion requirements, an element of the GTO score, a regional trauma registry was used to compare qEMAT vs. GTO score. A web-based calculator was developed.

Results: 840,294 patients were included in the training dataset and 402,331 patients in the validation dataset. The fEMAT score (median 91, SD: 82-102) included 26 factors and the qEMAT score included 8 factors. AuROC was 0.84 for fEMAT (Brier: 0.04) and 0.80 for qEMAT. fEMAT outperformed all other trauma mortality prediction models (e.g. TRISS, ISS, age + ISS). qEMAT outperformed the GTO score in the regional trauma registry (AuROC: 0.87 vs 0.83).

Conclusion: The qEMAT and fEMAT models accurately estimate the probability of in-hospital mortality and can be easily calculated at admission. This timely information could aid in deciding transfer to tertiary referral center, patient/family counseling, and palliative care utilization.
Abstract #18 | Education | Education Science

TRACKING THE CAREER PATH OF PRELIMINARY RESIDENTS: WHERE DO THEY GO?
M Asaad, A Rajesh, A Chandra, J Cook, D Farley

Background: Non-designated preliminary (NDP) General Surgery (GS) interns have no job security after year one. Understanding how such NDP GS interns fare at any single institution, as well as across the country, might help future prelim applicants make better NRMP ranking decisions and assist GS program directors and their institutions to better manage the number of prelim spots offered.

Objective: We aimed to identify the career path followed by our NDP residents after their preliminary year and determine the eventual residency outcomes of this group.

Methods: A retrospective cohort analysis of all NDPs who completed a preliminary year at our institution from 1993-2017 was conducted through program records and internet registries (Doximity, LinkedIn, etc.) to understand their career path following their preliminary GS year. A chi-square test was completed to analyze the data (p<0.05 was considered statistically significant).

Results: 315 NDPs (232 International Medical Graduates [IMGs] and 83 American Medical Graduates [AMGs]) were identified. 235 (75%) matched into categorical residency spots (115/235 [49%] in General Surgery, 18/235 [8%] each in Orthopedic Surgery and Anesthesiology which were the highest among surgical and non-surgical specialties respectively) after their preliminary year, 58 (18%) matched into a new 2nd year preliminary spot, and 22 (7%) left Graduate Medical Education. AMGs (90%) more commonly matched into categorical spots than IMGs (69%; p<0.0001. Table 1). 154 (49%) of our total N-DPR cohort eventually garnered categorical General Surgery residency slots. Importantly, 33 (65%) of our N-DPRs who pursued a PGY2 preliminary surgery position subsequently obtained a categorical general surgery residency.

Among 315 N-DPRs, 16% (n=51) joined our categorical General Surgery residency, either as a PGY-2 (n=29) to fill an open spot, or as a PGY-1 (n=22) through the match. 95% (n=300) of our N-DPRs are currently practicing in the United States.

Conclusion: Most N-DPRs at our institution are able to secure categorical spots for continuing graduate medical education. A preliminary internship year seems a useful endeavor for most trainees and even a 2nd prelim year produces a categorical position for most of these driven and hard-working men and women.
ARE SURGICAL RESIDENT TRAINEES MORE LIKELY TO RECEIVE A PATIENT SAFETY REPORT?
MC Bobel, S Kemp, CF Branson, MA Jurich, RE Bulander, ME Brunsvold

**Background:** Poor interprofessional communication is one of the leading causes of patient care errors. We previously reported that male, non-white, and foreign-born trainees are more likely than their peers to receive a patient safety report. Anecdotal evidence suggests that trainee specialty might also be a factor. Since hospital staff generally prefer empathetic, psychosocial communication, the typical surgeon communication style (directive and non-empathetic) can lead to a hostile work environment and the submission of patient safety reports.

**Objective:** We hypothesize that surgical trainees are more likely to receive a patient safety report compared to non-surgical trainees.

**Methods:** Our large, midwestern university hospital uses the ICARE system (Marshall ClearSight, Atlanta, GA) for patient safety reporting. We requested deidentified data from all ICARE reports involving resident and fellow trainees from 2018. The frequency of surgical trainees receiving an ICARE report was compared to non-surgical trainees.

**Results:** In 2018, there were 819 trainees at our institution, of which 230 (28%) were surgical trainees. In that year, 162 ICARE reports involving trainees were submitted. Surgical trainees received 73 ICARE reports (45%, $X^2=24.2$, $P<0.0000009$).

**Conclusion:** Surgical trainees are significantly more likely to receive a patient safety report than non-surgical trainees. This increased reporting pattern would support an implicit or explicit preference for more empathetic, psycho-social communication. Further work will examine the reason for the increased reporting pattern. If communication style is the reason, then an intervention could be developed to improve surgical trainee communication, thereby promoting a healthy work environment and a culture of patient safety.
ROBOTIC SURGERY IN RESIDENCY CURRICULA: WHAT DO RESIDENTS SAY?
A Rajesh, A Chandra, S Fattahi, C Backstrom, D Farley

Background: Robotic surgery is an evolving field and most training centers try to incorporate robotic experiences into their residency program. While not yet a mandatory component of General Surgery (GS) residency training (as laparoscopic and endoscopic skills are), applicants to residency programs and GS residents often express interest in gaining exposure to robotic surgery. Some specialties, like Urology and Gynecologic Surgery, have been early adopters of robotic surgery and their residency review committees mandate such training. We pondered whether there is a measurable difference among surgical trainees in 2019 in their interest for robotic surgery.

Objective: To determine the differences in perspectives about the importance of robotic surgery in surgical residency curricula

Methods: A 10-question survey was administered to all GS, Urology, and OBGYN residents at one academic institution. Residents reported on how much they value robotic surgical experience in their training using a 5-point Likert Scale (1 being ‘Strongly Disagree’ to 5 being ‘Strongly Agree’). Statistical analysis comparing the responses of GS residents with that of residents in Urology and OBGYN was completed using a t-test (p<0.05 was considered statistically significant).

Results: Among 110 surgical trainees (GS= 67, U= 25, OBGYN= 18), 75 completed the survey (GS= 48, U = 15, OBGYN = 12) comprising a 68% response rate. There were significant differences between the mean ratings offered by GS trainee and non-GS trainee groups of residents (Table 1). 85% of Urology/OBGYN residents expressed being interested in robotic surgery prior to or during medical school, compared to 48% of GS residents.

Conclusion: The enthusiasm for pursuing robotic surgery and seeking residency programs offering this training is currently stronger for Urology and OBGYN residents than for GS residents. It will be interesting to re-evaluate the enthusiasm of GS residents over the next decade to see if they, too, will find this portion of their training more desirable.

Graph on next page
<table>
<thead>
<tr>
<th>Question/Statement</th>
<th>Mean Likert Score (General Surgery Residents)</th>
<th>Mean Likert Score (Urology/Ob/Gyn Residents)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>When I was applying for surgical residencies, l looked for a program that offers robotic training</td>
<td>2.81</td>
<td>4.48</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Opportunities for robotic training influenced my ranking of a program</td>
<td>2.52</td>
<td>3.89</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>I am interested in pursuing a career/subspecialty incorporating robotics into practice</td>
<td>3.72</td>
<td>4.29</td>
<td>0.0115</td>
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<tr>
<td>There should be a structured curriculum for robotic training in a residency program</td>
<td>4.08</td>
<td>4.31</td>
<td>0.188</td>
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<tr>
<td>Robotic surgery will replace laparoscopic surgery in the years to come</td>
<td>2.81</td>
<td>3.66</td>
<td>0.003</td>
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<td>Robotic surgery skills should be taught alongside laparoscopic skills in a residency program</td>
<td>3.96</td>
<td>4.52</td>
<td>0.0047</td>
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<tr>
<td>If I were to make a decision now, I would not choose a residency program that does not offer robotic training</td>
<td>2.92</td>
<td>4.33</td>
<td>&lt;0.0001</td>
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</table>
MAYO CLINIC - TOMORROW'S RURAL SURGEONS
Randy C. Lehman, MD; Brandon G. Douglass, MD; Stephanie F. Heller, MD; Michael C. Roskos, MD

Background: There is well documented need for broad based rural surgeons in America. This improves access to care for an underserved population and often preserves the viability of rural hospitals. The American College of Surgeons is active in documenting this need and supporting its rural surgeons throughout the nation. There have been several new training programs which have been developed with the idea to tailor training for new surgeon's to given the skills that they need to practice in rural America.

Objective: The Mayo Clinic has joined the calling to produce excellent rural surgeons with a specific skill set tailored to the needs of rural America, where specialists an Ob/gyn, ENT, urology, Orthopedics, and Plastic surgery often do not exist due to the size of the community.

Methods: This educational paper details the current need, the rural surgery track which has been designed by the Mayo Clinic, and our experience over the first 4 years of its implementation.

Results: Our training track can serve as a model for others to both replicate and learn from as other academic institutions also join the cause in training the next American rural surgeon.

Conclusion: Our paper has multiple recommendations based on our experience for a successful development of a Rural Surgery Training Track.