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ROBOTIC LEFT SIDED COLORECTAL RESECTION WITH NATURAL ORIFICE INTRACORPOREAL ANASTOMOSIS WITH EXTRACTION OF SPECIMEN: THE NICE PROCEDURE. A PILOT STUDY OF LEFT SIDED CANCER

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Background: The robotic approach using Natural orifice Intracorporeal anastomosis with Extraction of Specimen (NICE) has been described for left sided colectomy. The method involves natural orifice-assisted transrectal extraction and formation of an intracorporeal anastomosis with complete elimination of any incision other than those required of the ports. We report one year follow up in a cohort of consecutive patients who underwent the NICE procedure for colorectal cancer.

Objective: Our study is a follow up study of patients with left sided cancer who underwent the NICE procedure up to 1 year after the procedure.

Methods: Over a 12-month period, consecutive patients presented for resection for sigmoid, rectosigmoid and upper rectal cancer underwent the NICE procedure. Patient data were analyzed including postoperative morbidity, mortality, and local and distant recurrence rate.

Results: In total, 32 patients underwent the NICE procedure for tumor located in the sigmoid (n=16), rectosigmoid (N=5) and upper rectum (N=11). The average length of stay was 2.19 days (range 1-4 days). There were 3 readmissions, one with pelvic abscess requiring drainage, one with portal vein thrombosis and one as an elective admission for right portal vein embolization in a known liver metastasis prior to resection. Thirteen patients had stage I disease, 7 patients had stage II, 10 patients had stage III disease and 2 had stage IV disease. On pathology, all margins were negative and total number of lymph nodes harvested was >12 in all but 3 patients. Intracorporeal anastomosis was accomplished in all patients and transrectal extraction was successful in 25 (84%). In 7 (16%) patients, large specimen size required an abdominal incision for extraction. At a mean follow up of 10 months (range 3-17) the survival rate is 100%. One patient who presented with stage IV disease prior to surgery had recurrence in a presacral lymph nodes at 7 months following resection.

Conclusion: The NICE procedure for colorectal cancer is a safe and feasible procedure with ability to maintain principles of oncologic resection in regard to negative margin status and lymph node yield. Furthermore, those who undergo transrectal extraction of a cancer specimen do not have a propensity for local recurrence in the rectum at one year follow up. Larger cohorts of patients and longer follow up will be required to continue to investigate.

EFFECTIVENESS OF BARIATRIC SURGERY IN END-STAGE RENAL DISEASE REQUIRING DIALYSIS TO INCREASE RENAL TRANSPLANT ELIGIBILITY

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Background: Morbid obesity can increase risk of complications after renal transplantation. There is a paucity of literature on bariatric surgery outcomes in renal transplant candidates.

Objective: The primary objective was to study effectiveness of bariatric surgery as a weight reduction strategy in end stage renal disease (ESRD) patients to qualify for renal transplantation.

Methods: We performed a retrospective analysis of a prospectively collected Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database at a single institution for patients with ESRD on hemodialysis who underwent bariatric surgery between 2011 and 2018. Patient characteristics and bariatric outcomes were analyzed.

Results: Of 2,363 patients underwent bariatric surgery, 38 (1.6%) had ESRD on hemodialysis; mean age was 49.8 years, 52.6% were female, and mean BMI was 44.2. Twenty-four patients underwent laparoscopic Roux-en-Y gastric bypass (LRYGB) and 14 patients underwent laparoscopic sleeve gastrectomy. After 6 months, 17 patients (46%, n=37 had a BMI \leq 35, while 25 patients (75.8%,n=33) achieved BMI \leq 35 at 12 months. There was no statistically significant difference in patients who reached desirable BMI at 12 months between sleeve and LRYGB procedures, P=0.58. Median length of stay (LOS) was 2.3 days. 30-day readmission rate was 5.3% (2 patients), and 2 patients (5.3%) required reoperation (one for bleeding, one for acute recurrent hiatal hernia). Also, 2 patients (5.3%) required transfusions peri-operatively. No mortality occurred.

Conclusion: Laparoscopic bariatric surgery offers effective weight loss for patients with ESRD who desire transplant eligibility and can be achieved with acceptable outcomes in a high-risk population.

Table 1: Patient characteristics

| Demographic Variable | Total (%) (N = 38) |
|--------------------------------|------------------------|
| Age (years), mean (IQR) | |
| Now | 52.9 (47, 61) |
| At time of surgery | 49.7 (43, 56) |
| Gender, n (%) | |
| Female | 20 (52.6) |
| Male | 18 (47.4) |
| Race/Ethnicity, n (%) | |
| White | 16 (42.1) |
| Black or African American | 19 (50.0) |
| Asian | 1 (2.6) |
| Unknown | 2 (5.3) |
| Height (inches), n, mean (IQR) | 67.4 (65, 71) |
| Procedure, n (%) | |
| AGB to RNY | 3 (7.9) |
| AGB to Sleeve | 3 (7.9) |
| RNY | 21 (55.3) |
| Sleeve | 11 (28.9) |
| Weight (lbs), N, mean (IQR) | |
| Baseline | 38, 287.8 (246, 316.4) |
| 3 months | 22, 228.3 (194, 261) |
| 6 months | 34, 238.5 (204.2, 261) |
| 12 months | 26, 218.8 (192.2, 242) |
| 18 months | 9, 226.4 (192, 251) |
| 24 months | 11, 227.6 (184.8, 246) |
| BMI, N, mean (IQR) | |
| Baseline | 38, 44.2 (40, 49.7) |
| 3 months | 22, 35.8 (33.3, 37.8) |
| 6 months | 34, 37.0 (33.6, 41.3) |
| 12 months | 26, 34.6 (31.0, 37.3) |
| 18 months | 9, 34.3 (30, 39.6) |
| 24 months | 11, 34.9 (30.7, 40.1) |
| Target_BMI_35, N, n (%) | |
| Baseline | 38, 1 (2.6) |
| 6 months | 37, 17 (46) |
| 1 year | 33, 25 (75.8) |
| 2 years | 17, 12 (70.5) |

ePoster #3 | Clinical Science | Cardiothoracic

DIAGNOSIS AND MANAGEMENT OF STERNOCLAVICULAR JOINT INFECTIONS

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Background: Sternoclavicular Joint (SCJ) infections (SCJI) constitute less than 1% of all joint infections and is most commonly caused by *Staphylococcus aureus*. The joint lies in proximity with important neuro-vascular structures and organs including subclavian vessels, phrenic nerve etc. making this a serious infection needing prompt treatment. The presentation of this infectious is ambiguous and masquerades a lot of other maladies delaying diagnosis and causing spreading of infection to deeper tissues including bone. There is no standardized diagnostic workup and treatment protocol for this type of joint infections as defined in the literature.

Objective: Review the existing literature to understand the current knowledge on the diagnosis and treatment methods of SCJI.

Methods: We searched English publications in PubMed and included clinical trials, case reports, case series, retrospective cohort studies, literature and systematic reviews on SCJI. We excluded papers with non-infectious etiology of SCJ pathology from this review.

Results: Certain pre-existing factors like immunocompromised state, IVDU, trauma arthropathies predispose patients to develop an infection of the SCJ. It can usually present as fever, joint swelling, immobility. However, there are some unusual presentations such as vocal cord palsy, dysphagia are also reported in literature. While *Staphylococcus aureus* causes over 50% of cases, other pathogens include *Pseudomonas*, *Mycobacterium* etc. Work up includes inflammatory labs and imaging of which MRI is 100% sensitive. If diagnosed early, the infection can be medically managed with antibiotics or simple joint aspirations. However, extensive spread of the infection requires piecemeal or en-bloc resection and/or muscle flap, tendon autografting, bone implantation etc. Complications of

undertreatment include abscess formation, mediastinitis, sepsis. Most patients retain functionality of their joint. Aggressive and early physical therapy is paramount in healing and preservation of the joint function.

Conclusion: SCJI are rare but serious joint infections. Early detection and interventions are the goal to treat SCJI. Surgical intervention should be taken as soon as diagnosis is made. Most cases of SCJI showed complete resolution in months with minimal change in functionality. In some cases, patients may still have pain, swelling, immobility afterwards which can be addressed by arthroscopic debridement of the joint. Aggressive physiotherapy can help prevent the development of adhesive capsulitis of the shoulder.

IS LATERALITY OF PRIMARY COLORECTAL CANCER ASSOCIATED WITH SURVIVAL AFTER PULMONARY METASTASECTOMY?

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Background: While colorectal cancer (CRC) laterality has been shown to independently predict survival, it has not been previously studied in the setting of pulmonary metastatic disease.

Objective: Therefore, we sought to determine if primary disease laterality, among other disease factors, impacts survival and recurrence after pulmonary metastasectomy (PM).

Methods: Patients who underwent PM for CRC at a single institution from 2011 to 2018 were reviewed. Univariate and multivariate Cox regression analyses were performed to identify predictors of survival, disease-free survival (DFS).

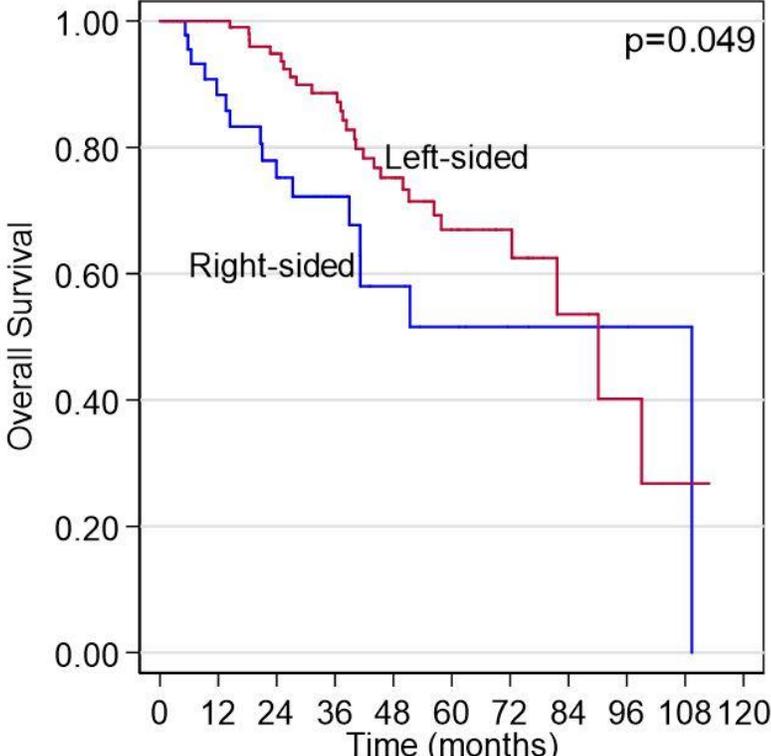
Results: 201 patients were evaluated, among whom 124 (62%) were male, with a median age of 57.6 years. The median follow-up, survival time, and 5-year survival rate were 36.8 months, 75.8 months, and 57%, respectively. 127 (63%) patients experienced disease recurrence, including 108 (54%) patients with lung recurrences.

Upon univariate analysis, survival was predicted by age, laterality, adjuvant chemotherapy, prior or synchronous hepatic metastatic disease, preoperative lung chemotherapy, unilateral disease, smaller lesions, and less than 3 metastases at initial PM. On multivariate analysis, left-sided CRC (hazard ratio [HR] 0.52; $p=0.040$) remained predictive of survival (Figure), while larger metastasis size was associated with hazard of death (HR 1.17; $p=0.034$). Additionally, there was a trend for laterality overall to predict survival, ($p=0.056$). Upon unadjusted Kaplan-Meier analysis for survival, patients with left-sided tumors had prolonged survival when compared to those with right-sided primary disease ($p=0.049$). DFS was associated with tobacco history (HR 1.45; $p=0.038$) and administration of preoperative lung chemotherapy (HR 0.66; $p=0.018$).

Conclusion: Left-sided CRC is associated with prolonged survival following PM, while metastasis size is associated with increased hazard of death. Furthermore, there appears to be a trend for laterality overall to be associated with survival. Future investigations should aim to determine differential treatment and counseling strategies for pulmonary metastatic disease based upon side of primary tumor.

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Figure: Cumulative survival probability according to colorectal cancer laterality.



Number at risk

| | | | | | | | | | | | |
|-------|-----|-----|----|----|----|----|----|---|---|---|---|
| Right | 47 | 36 | 28 | 18 | 10 | 7 | 4 | 3 | 2 | 1 | 0 |
| Left | 113 | 102 | 79 | 64 | 45 | 28 | 16 | 6 | 3 | 1 | 0 |

LONG-TERM FOLLOW-UP AFTER BARIATRIC SURGERY IN PATIENTS WITH LEFT VENTRICULAR ASSIST DEVICE: A CASE SERIES OF FOUR PATIENTS

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Background: Patients with end-stage heart failure (HF) increasingly present with coexistent morbid obesity, with body mass index (BMI) greater than 35 kg/m² precluding eligibility for heart transplant under current guidelines due to inferior post-transplant outcomes. Continuous flow left ventricular assist device (CF-LVAD) implantation is a life-saving intervention for end-stage HF as a bridge to transplant, but typically leads to weight gain. Laparoscopic sleeve gastrectomy (LSG) is an established intervention for weight loss in morbidly obese patients, but there is a paucity of data examining long-term safety and efficacy for this procedure in patients on CF-LVAD support.

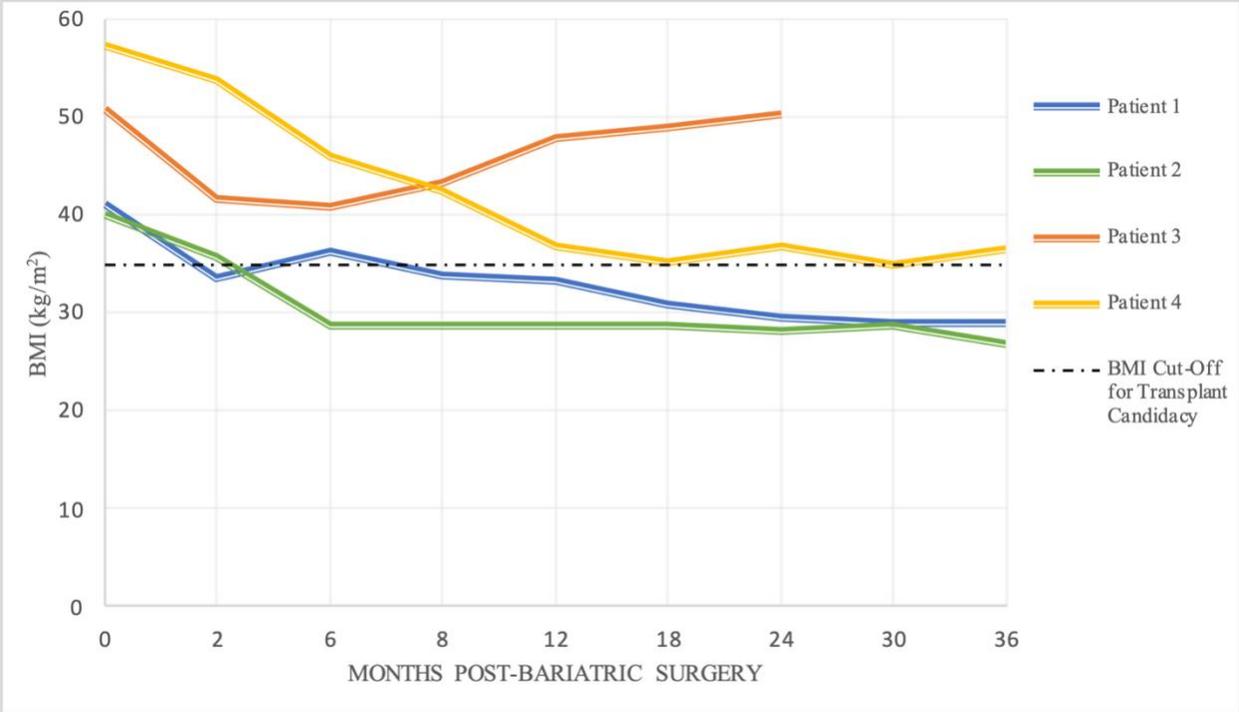
Objective: To characterize long-term clinical outcomes of end-stage HF patients undergoing LSG while dependent on CF-LVAD support.

Methods: Patients undergoing ventricular assist device implantation and subsequent laparoscopic sleeve gastrectomy procedures from 2009 to 2019 were retrospectively identified. Baseline demographics, preoperative characteristics, and postoperative outcomes were extracted by chart review. Descriptive statistics are presented as median and range for continuous variables.

Results: Four patients (three male, one female) with median age of 43 years (range 32-78) and BMI of 47 kg/m² (range 40-57) underwent LSG while on CF-LVAD support for non-ischemic cardiomyopathy. LSG occurred at a median of 992 days (range 870-1849) after initial CF-LVAD implantation (three HeartMate II, one HeartWare). Comorbidities included hypertension (n=4), atrial fibrillation (n=2), diabetes (n=3), and prior cerebrovascular accident (n=3). LSG was technically successful and well tolerated in all four patients without major morbidity or mortality. Median follow-up after LSG was 41 months (range 24-47). Body mass index decreased to a median of 31.9 kg/m² (range 26.9-40.8) at maximal weight loss, with median percent excess body mass index lost (%EBMIL) of 72.5% (range 38.6-87.4) (Figure 1). After achieving target weight, one patient is currently listed for heart transplant and a second is awaiting listing. The third patient began to regain weight at 6 months and remains ineligible. The fourth patient remains on destination CF-LVAD therapy due to positive drug screens precluding transplant eligibility.

Conclusion: On long-term follow-up, laparoscopic sleeve gastrectomy is a safe and feasible option for obese patients with ventricular assist devices seeking weight reduction for transplant consideration. CF-LVAD patients may face issues with weight regain as previously demonstrated in the general bariatric surgery population, though it remains to be seen if the causative factors are comparable. Additional studies are warranted to evaluate the factors determining the success or failure of surgical weight loss strategies in the CF-LVAD population and the effect of such strategies on outcomes after heart transplantation.

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FACTORS INFLUENCING MEMBERSHIP OF CARDIOTHORACIC TRAINEES IN THE AMERICAN COLLEGE OF SURGEONS

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Background: The American College of Surgeons (ACS) is an association which was created to improve the quality of care for surgical patients by setting the standards for education and clinical practice. With over 82,000 current members, the ACS is the largest surgical organization in the world. Subspecialty membership in the ACS has declined over time, however. This phenomenon has been especially observed in cardiothoracic surgery in the last 10 years. Several explanations have been suggested but detailed analyses into exact reasons have not been performed.

Objective: The objective of this study was to evaluate factors which influence the likelihood of cardiothoracic fellows and residents to join the ACS.

Methods: An electronic survey was sent to all current trainees in cardiothoracic surgery programs nationwide. The survey contained questions regarding the type of cardiothoracic training program (traditional, integrated, 4/3), whether a trainee was a current member of the ACS and factors which influenced the decision either to join the ACS or abstain from joining. All survey results were anonymous.

Results: Thirty-two percent (154/488) of trainees responded. Fifty-two percent (80/154) of respondents were members. Among the entire cohort, 92% (142/154) had never seen an advertisement from the ACS seeking their involvement as a cardiothoracic surgeon. Eighty-nine percent (137/154) of trainees said they would be more likely to join the ACS if projects presented at the annual meeting were given preferential consideration for publication in cardiothoracic journals.

Cardiothoracic trainees following a traditional training pathway were more likely to be members than trainees in other pathways ($p < 0.01$). Among trainees who were members, the most common reasons were to present their research at the annual meeting (43%) and to improve their search for job opportunities (39%). Among trainees who were not members, the most common reason was that the annual meeting did not focus enough on cardiothoracic surgery (52%).

Conclusion: Overwhelmingly most cardiothoracic trainees had never seen an advertisement about joining the ACS. Targeted marketing of the benefits of ACS involvement and an increased consideration of publication in subspecialty-specific journals could increase trainee participation.

DO STUDENTS MATCHING INTO NON-SURGICAL SPECIALTIES EXPERIENCE THE SURGERY CLERKSHIP DIFFERENTLY?

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Background: The surgery clerkship has been shown by several studies to be a deciding point in many students' decision to pursue the specialty. However, it is not known if those who pursue a residency in a surgical specialty experience the clerkship differently from those who choose to pursue non-surgical specialties.

Objective: The purpose of our study was to identify whether students who eventually matched into surgical residency programs perceived the clerkship differently when compared to those who did not. We also pursued the same comparison with regards to their reported experience of mistreatment.

Methods: Data from the 2016-17 student evaluations of the surgery clerkship were analyzed using SPSS with institutional IRB approval. Students were able to rate the clerkship on 17 domains on a 7-point Likert scale in addition to a Yes/No question regarding experiencing or witnessing mistreatment. Each of the 17 Kruskal Wallis and Mann Whitney U tests analyzed for differences in clerkship experiences between medical students who matched into three residency categories (General Surgery, Other Surgical Specialty or Non-Surgery) and based on mistreatment.

Results: Based on 294 completed evaluation forms, 7 of the 17 evaluation items resulted in statistically higher ratings of clerkship experience for those who matched into either a general surgery or other surgical residency program compared to those who matched into non-surgical programs. There were no differences in clerkship experience between students who matched into general surgery compared to those who pursued other surgical programs. Of the 15 students (5%) who reported they experienced or witnessed mistreatment on the surgery clerkship, only one matched into a surgical residency program. Students who witnessed or experienced mistreatment also reported statistically poorer scores on 9 of the 17 evaluation items for the clerkship. Table 1 outlines test statistics for a sampling of items that differed when comparing the groups as outlined above.

Conclusion: Students who matched into surgical training programs had significantly better experiences on the surgery clerkship compared to those who matched into non-surgical programs. Further investigation is needed to learn whether negative experiences on the surgical clerkship led students to choose non-surgical residency programs or whether students with limited interest in surgery had more negative experiences or were more prone to critically perceive the clerkship compared to those interested in surgery. Especially given studies documenting the declining interest in general surgery as a career, elevating experiences on the surgery clerkship requires a deliberate focus on improved teaching and feedback, safer learning environments, patient experiences, and reduced mistreatment for all learners.

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Table 1. Group Differences based on Match Data and Experiences with Mistreatment on Surgery Clerkship

| Clerkship Evaluation Items | Match Data | | Experiences/Witnessing of Mistreatment | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------|-------------------------------------------|-----------------------------------------------|
| | Is there a difference? | How did groups differ? | Is there a difference? | How did groups differ? |
| | Kruskal Wallis H & (η^2) effect size | Pairwise Comparison Mann Whitney U Mean Ranks | Mann Whitney U & (η^2) effect size | Pairwise Comparison Mann Whitney U Mean Ranks |
| 1. This clerkship exposed me to patients with a variety of medical conditions. | * $X^2(2)=10.41$ $\eta^2= .03$ | Other Surg > Non Surg | * $U=1380.5$ $\eta^2= .02$ | No Mistreat > Mistreat |
| 2. I had the opportunity to be meaningfully involved in the care of patients. | * $X^2(2)=9.52$ $\eta^2= .03$ | Other Surg > Non Surg Gen Surg > Non Surg | * $U=1306$ $\eta^2= .02$ | No Mistreat > Mistreat |
| 3. In general, faculty provided effective teaching during this clerkship. | * $X^2(2)=8.30$ $\eta^2= .02$ | Other Surg > Non Surg Gen Surg > Non Surg | * $U=1306.5$ $\eta^2= .02$ | No Mistreat > Mistreat |
| 4. To what extent do you agree or disagree that the clerkship maintains a learning environment that fosters professional behavior among students, residents, and faculty? | * $X^2(2)=15.29$ $\eta^2= .05$ | Other Surg > Non Surg | * $U=1231$ $\eta^2= .03$ | No Mistreat > Mistreat |
| 5. How safe was your learning environment? | * $X^2(2)=9.65$ $\eta^2= .03$ | Other Surg > Non Surg Gen Surg > Non Surg | * $U=825$ $\eta^2= .05$ | No Mistreat > Mistreat |
| 6. Rate the quality of your educational experiences. | * $X^2(2)=16.98$ $\eta^2= .05$ | Other Surg > Non Surg Gen Surg > Non Surg | * $U=1030.5$ $\eta^2= .04$ | No Mistreat > Mistreat |

Note: * = $p < 0.05$

General Surgery (n=21); Other Surgery (n=54); Non Surgery (n=219).

Pairwise comparisons indicate which rank means were greater between groups for statistically significant findings.

(η^2) effect size interpretation: 0.01=small, .06=medium, 0.14=large

MEDICAL MISSION TRIPS AS A BURNOUT AID FOR THE SURGICAL RESIDENT

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Background: Wellness in graduate medical education is the focus of many current initiatives by the Accreditation Council for Graduate Medical Education (ACGME). In a biannual trip to Puerto Plata, surgical and anesthesia residents are involved, on average, 75 cases spanning from general surgery, obstetrics and gynecology, otolaryngology, and vascular surgery. Without ACGME backing, this program is self sponsored by the residents and completely voluntary.

Objective: Medical mission work can be a vital part of surgical education for technical skills, problem solving, and resident wellness due to the ability to provide a service to the underserved

Methods: Retrospectively, the residents were asked about not only their experience, but their subjective assessment of their own burnout following the trips. They were also asked if they would return for the trip and if they would continue in overseas surgical trips in the future. The total number of cases and distribution per trip were taken from the Hispaniola Medical Charity leadership.

Results: All residents reported a positive experience on the trip as well as decreased rates of burnout among them. They all would like to participate in future surgical trips and over 85% would like to return for this biannual trip. When residents were present, they would participate in roughly 30 cases over their 4 operative days per trip. Of the general surgery cases, 50% were routine hernias, 30% cholecystectomies, and 20% soft tissue cases.

Conclusion: Surgical mission trips provide an opportunity for surgical residents to continue learning in a foreign, underserved environment and simultaneously improve their general well being. Despite performing cases without many of the modern luxuries found in the United States, residents found the experience to be valuable for their education and their mental health. They also train residents for a global health oriented future. The regulations surrounding residents on international medical mission trips should be reexamined.



ePoster #9 | Education Science | Education

SKWNESS IN MEDICAL STUDENT EVALUATION OF SURGICAL FACULTY: ARE WE RECEIVING CONSTRUCTIVE FEEDBACK?

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Background: Given that surgical education is one of the three pillars of academia, faculty development in this area is often done by using data gathered from student evaluations. Moreover, some surgical clerkships, allow students to pick the faculty member they believe is best suited to provide them with constructive feedback. We hypothesize that this, in turn, may lead to positively skewed data as students may select faculty that already excel in surgical education in anticipation of the reciprocity effect.

Objective: We aim to study medical student evaluations of faculty to determine if there exists a positively skewed distribution of evaluation scores.

Methods: Data from the Student Evaluation of Faculty form were extracted with IRB approval for the Surgery clerkship at our institution from 2014-2019 and analyzed using SPSS. Medical students at our institution choose faculty members to evaluate them and they, in turn, evaluate that faculty member. The evaluation form includes eight questions regarding teaching effectiveness that are graded on a 7-point Likert scale. We analyzed data for each faculty member by aggregating all completed forms and calculated an average score for each evaluation item.

Results: 133 attending faculty had at least one Student Evaluation of Faculty form completed over the past five years (total of 3741 evaluations). The range of evaluations completed by students for each faculty was between 1-263 evaluations (average of 28 ± 35 evaluations per faculty). Across the 133 attendings, the lowest rated teaching behavior was regarding “feedback about performance” (Mean=6.40 out of 7, SD=0.43) and the highest-rated teaching behavior was with regard to “showing respect to learners” (Mean=6.78 out of 7, SD=0.26). There was a left skew across all eight teaching evaluation items, indicating the distribution of ratings were towards the “Exceeding Expectations” end of the scale (Table 1).

Conclusion: Student Evaluation of Faculty forms are meant to identify areas for faculty development on teaching within clerkships. Our study findings revealed a positive skew to Surgery clerkship data regarding teaching effectiveness of Surgery attendings raising the possibility that the feedback received may not identify faculty who need assistance with developing teaching skills. Further investigation is needed to learn what determines students' selection of certain faculty and methods to reduce bias in collecting teaching evaluation data. Without such consideration, proper evaluation of clinical teaching effectiveness across all surgical faculty is limited for improvement and development of skills.

Table 1. Students' Teaching Evaluations of Surgery Faculty During Clerkships 2014-2019: Analysis of Skewness in Aggregate Data

| | Modeled professional behaviors to emulate | Used "teaching moments" to emphasize important points | Answered questions in a way that aided learning | Showed genuine interest in teaching | Gave helpful feedback (positive or negative) about performance | Asked questions that stimulated clinical reasoning | Showed appropriate respect to learners | Overall teaching effectiveness |
|----------------------------|-------------------------------------------|-------------------------------------------------------|-------------------------------------------------|-------------------------------------|----------------------------------------------------------------|----------------------------------------------------|----------------------------------------|--------------------------------|
| Mean | 6.68 | 6.63 | 6.66 | 6.62 | 6.40 | 6.53 | 6.78 | 6.60 |
| Standard Deviation | 0.35 | 0.32 | 0.29 | 0.39 | 0.43 | 0.42 | 0.26 | 0.35 |
| Skewness Statistic | -2.12 | -1.04 | -1.26 | -1.54 | -1.06 | -2.41 | -2.13 | -1.46 |
| Skewness Std. Error | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |
| Skewness Finding | Left Skewed | Left Skewed | Left Skewed | Left Skewed | Left Skewed | Left Skewed | Left Skewed | Left Skewed |

Note: Skewness statistics less than -1 indicate left skew (greater positive ratings on the teaching evaluation scale)

Mean out of 7 point scale (1= Below Expectations, 7=Exceeded Expectations)

, N=133 faculty

IMPROVED UPPER EXTREMITY TOTAL JOINT REPLACEMENT COST EFFECTIVENESS IN ORTHOPEDIC SPECIALTY HOSPITALS

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Background: Upper extremity total joint replacement (UETJR) procedures without major complications and comorbidities (Diagnosis-related group 484, DRG 484) have been growing in utilization in the past decade and are expected to increase in prevalence with the aging baby-boomer generation. Despite this increase in demand, the average costs for UETJRs have increased yearly. Previous research demonstrates that lower extremity total joint arthroplasty performed at orthopedic specialty hospitals (OSH) are executed at lower surgical costs, readmission rates, and complication rates than non-specialty hospitals (NSH). Additionally, other studies demonstrate higher surgical volume's association with better patient outcomes at lower cost.

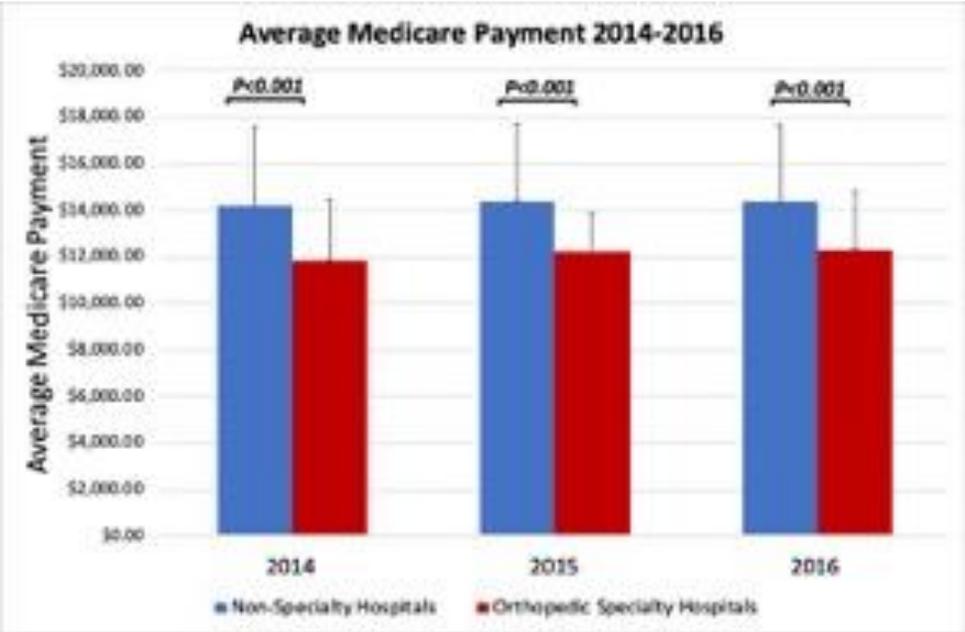
Objective: The purpose of this study is to determine the influence of volume and orthopedic specialization on cost in UETJR procedures.

Methods: Data was extracted from Centers for Medicare and Medicaid Services (CMS) Inpatient Charge Data, including the procedures, costs, and payments to CMS DRG 484 procedures from 2014-2016. An orthopedic specialization ratio (OSR), defined as the ratio of musculoskeletal discharges (DRG 453-565) to total discharges (DRG 001-989), was determined for each hospital. Using this ratio, the hospitals were divided into either Orthopedic Specialty Hospital (OSH = OSR > 0.97) or Non-Specialty Hospital (NSH = OSR ≤ 0.97) groups. Average Medicare payments (AMP) of DRG 484 were extracted for each hospital that performed at least 10 UETJR procedures. From the 2016 data, hospitals were further subdivided, based on the average number of UETJR discharges for NSH, into high-volume (≥ 40 DRG 484 discharges) or low-volume (< 40 discharges) for volume-dependent analysis. The aforementioned variables were compared between OSH and NSH using ANOVA and paired t-test analysis.

Results: OSH performed UETJR procedures at lower AMP than NSH in 2014, 2015, and 2016 (all P < .001). Specifically, AMP savings averaged to \$2174.64 per surgery at OSH in the years studied. No significant change in AMP was noted among OSH/NSH hospitals with respect to low/high UETJR discharge volume. Comparing the average Medicare payments from 2014 and 2016 between the OSH and NSH groups yielded no significant evolution in the 3-year span (P = 0.123 and P = 0.064, respectively), yet total volume steadily increased by nearly 10,000 discharges per year.

Conclusion: OSH perform UETJR procedures for Medicare patients at a markedly lower cost than NSH. The data suggests that OSH do not need to perform UETJR procedures at high volume to save CMS significant revenue. Although UETJR volumes have increased nationally, the costs have not decreased over time without intervention, further straining CMS resources. Eliminating the 2016 average Medicare payment difference for the UETJR procedures performed at NSH would have saved CMS over \$100 million. Facilities and surgeons may consider adopting OSH practices to reduce their UETJR cost and CMS burden.

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IMPROVED OUTCOMES FOR "MARGINAL" ALLOGRAFTS IN LIVER TRANSPLANTATION: MAYBE TIME FOR SOME NEW DEFINITIONS

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Background: The deficit of liver allografts available for transplantation is growing, leaving approximately 50% of wait-list candidates to die without transplantation each year. Up to 1600 allografts are discarded each year on the basis of marginality by one of six current definitions of "marginal" allograft. Investigation of the recipient outcomes of these marginal organs is essential to determine the efficacy of these six definitions and promote more efficient allograft use.

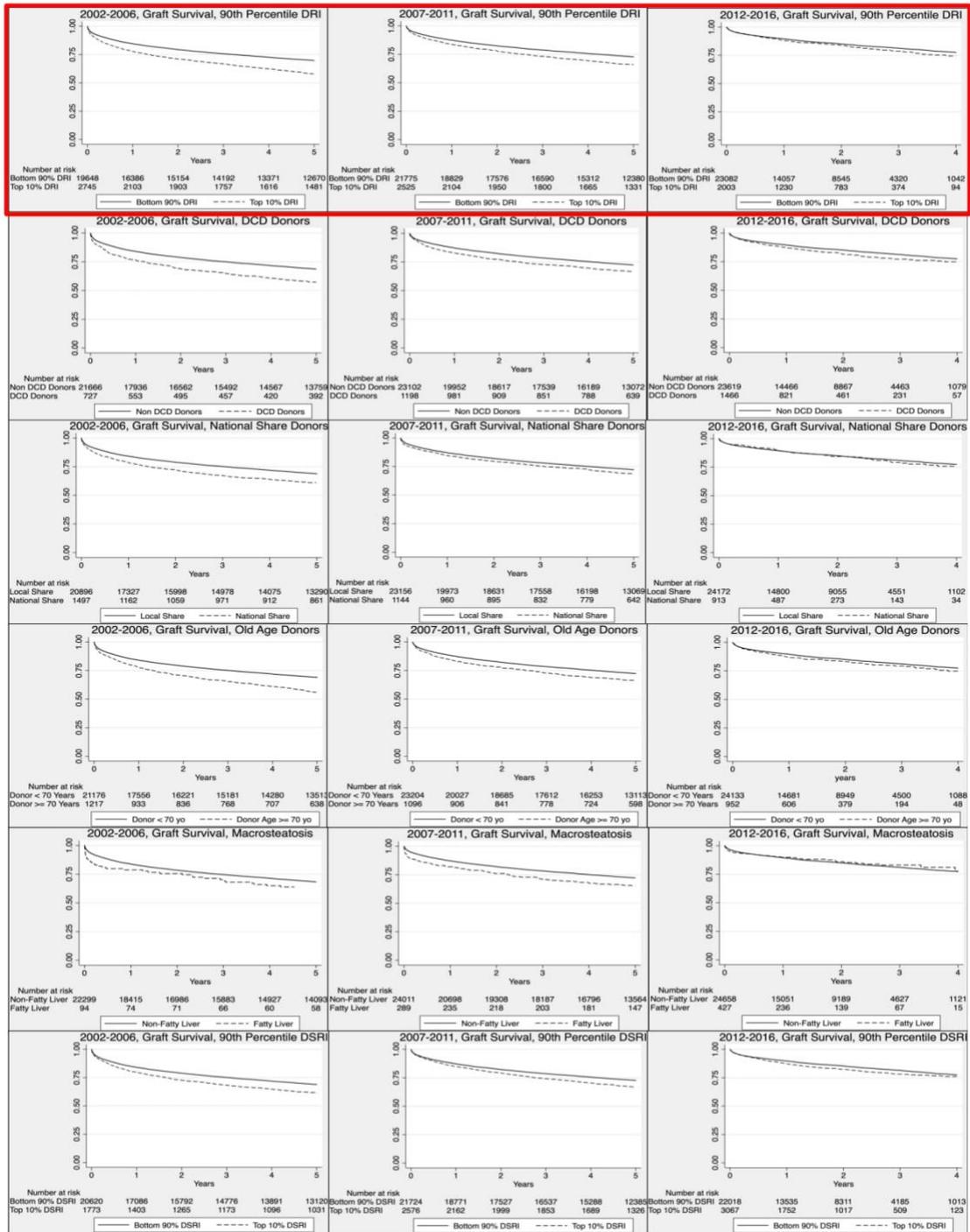
Objective: The objective of this study is to quantify recipient outcomes of marginal allografts as they are currently defined by one primary definition (90th percentile DRI) and five secondary definitions of marginal allografts.

Methods: 70,050 de-identified patients who received liver transplants between March 1, 2002 and September 30, 2016 were retrospectively analyzed to last known follow up (N=55,395) or death (N=19,655) using the United Network for Organ Sharing (UNOS). The study period was divided into 5 year eras to track outcomes over time. Each of the six definitions of marginal allograft were statistically analyzed over the 3 eras for graft survival and recipient survival using Kaplan-Meier with log-rank test and Cox regression methods.

Results: Discard Risk Index (DRI) significantly increased over the study period whereas cold ischemia time has significantly decreased (6.1 hours vs 7.5 hours, $p < 0.001$). Additionally, recipient MELD scores and BAR scores significantly increased over the study period (MELD 19.6 ± 9.1 from 2002-2006 and 21.8 ± 11.0 from 2012-2016, $p < 0.001$). Despite this, Cox regression analysis indicates that 90th percentile DRI allografts increased in recipient survival across the study period (2002-2006 HR 1.41 (1.34 – 1.49); 2007-2011 HR 1.25 (1.17 – 1.34); and 2012-2016 HR 1.10 (0.98 – 1.24)). By the end of the study period, there was no significant difference in recipient survival between 90th percentile DRI allografts and benchmark allografts (77.7% vs. 80.3%). Marginal allografts defined using the secondary definitions were also observed to have improved survival over the study period. Cold ischemia time under 6 hours was protective for both graft survival and patient survival and became a risk factor for both graft survival and patient survival when cold ischemia time was over 12 hours.

Conclusion: Marginal allograft survival and recipient survival are approaching benchmark outcome levels despite worsening allograft quality and recipient factors. This could be in part explained by the reduction in cold ischemia time over the study period. As the survival outcomes of marginal allografts, most notably 90th percentile DRI allografts, reach benchmark outcome levels, more stringent definitions of marginality should be created. Such redefinition of marginal allografts could result in more efficient use of currently defined marginal allografts and reduced waitlist mortality.

Graph on following page



Kaplan-Meier allograft survival over time across 3 eras for 90th Percentile DRI allografts (red outline) and 5 secondary marginal allograft definitions (top to bottom): Deceased cardiac donors, national share allografts, old age donor allografts, fatty liver allografts, and 90th Percentile DSRI allografts.

CERVICAL SPINE FUSION COST EFFECTIVENESS IN ORTHOPEDIC SPECIALTY HOSPITALS

T Zhang, R Poondla, A Drtil, L Bockhorn, M Laughlin, R Stuckey, J Williamson
Baylor College of Medicine

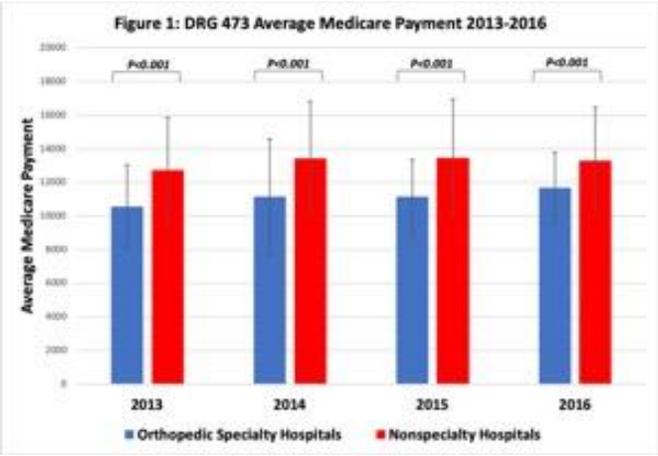
Background: Cervical Spine Fusion (CSF) procedures without major complications and comorbidities (Diagnosis-related group 473, DRG 473) have been growing in utilization in the past decade and are expected to increase in prevalence further. Previous research demonstrates that lower extremity total joint arthroplasty performed at orthopedic specialty hospitals (OSH) are executed at lower surgical costs, readmission rates, and complication rates than non-specialty hospitals (NSH). Additionally, other studies suggest that higher surgical volume is associated with better patient outcomes at lower cost.

Objective: The purpose of this study is to determine the influence of volume and orthopedic specialization on cost in CSF procedures.

Methods: Using a similar methodology to Bockhorn et. al, data was extracted from Centers for Medicare and Medicaid Services (CMS) Inpatient Charge Data, including the procedures, costs, and payments for CMS DRG 473 procedures in 2013, 2014, 2015, and 2016. An orthopedic specialization ratio (OSR), defined as the ratio of musculoskeletal discharges (DRG 453-565) to total discharges (DRG 001-989), was determined for each hospital. Using this ratio, the hospitals were divided into either Orthopedic Specialty Hospital (OSH = OSR > 0.97) or Non-Specialty Hospital (NSH = OSR ≤ 0.97) groups. Average Medicare payments of DRG 473 were extracted for each hospital that performed at least 10 CSF procedures. From the combined 2013 to 2016 data, hospitals were further subdivided into high volume of DRG 473 discharges (4th quartile) low volume of DRG 473 discharges (1st quartile) for volume-dependent analysis. The aforementioned variables were compared between OSH and NSH performing CSF procedures using ANOVA and paired t-tests.

Results: OSH performed CSF procedures at lower AMP than NSH in 2013, 2014, 2015, and 2016 (all $P < .001$, Figure 1). Specifically, AMP savings averaged to \$2102.69 per surgery at OSH in the years studied. No significant change in AMP was noted among orthopedic specialty hospitals with respect to volume. The Average Medicare Payments for both orthopedic specialty hospitals and non-orthopedic specialty hospitals significantly increased from 2013 to 2016 ($P = 0.012$ and $P = 0.0003$, respectively).

Conclusion: OSH perform CSF procedures for Medicare patients at a markedly lower cost than NSH. The data strongly suggests that this deficit between OSH and NSH costs is not related to surgical volume and OSH do not need to perform CSF procedures at high volume to lower costs. Although CSF volumes have increased nationally, the costs have not decreased over time without intervention, which underscores the integral role of OSH in improving the cost-effectiveness of CSF procedures. OSH would have reduced CSF procedural costs by over \$43 million for the 20,738 procedures done in NSH in 2016. Facilities and surgeons may consider adopting OSH practices to improve cost-effectiveness of this increasingly utilized procedure.



CORNELIA DE LANGE SYNDROME IN CONGENITAL DIAPHRAGMATIC HERNIA

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Background: Cornelia de Lange Syndrome (CDLS) is a constellation of genetic abnormalities with a prevalence estimated to be between 1 in 10,000 to 1 in 30,000 live births. The syndrome includes multiple congenital anomalies, including growth retardation, intellectual disability, and extremity malformations. The developmental pathobiology of CDLS is incompletely understood, but it has been associated with abnormalities in genes affecting chromatin regulation. A number of studies have suggested an association between CDLS and congenital diaphragmatic hernia (CDH), with CDH being the reported cause of death in 5-20% of cases of CDLS.

Objective: Our objective was to identify the characteristics, management, and outcome of patients with CDLS and CDH. We hypothesized that CDLS would be associated with severe, high-risk CDH and poor outcomes.

Methods: All live-born patients with CDH between 1995 and 2019 in the CDH study group were included. Those with CDLS were reviewed retrospectively. Binary and continuous parametric data were assessed using chi-squared, Fisher's exact or Student's t-tests, and continuous non-parametric data were assessed with Wilcoxon Rank Sum tests. All statistical analyses were performed using Stata/IC 16 (Stata Corp LP, College Station, Texas).

Results: A total of 9251 Bochdalek patients were identified in the database. Of those patients, 585 (6.3%) were diagnosed with at least one chromosomal abnormality, and 21 (0.23%) had confirmed CDLS. Among patients with CDLS and CDH, 12 (57%) were female, 16 (76%) had left-sided defects, and 7 (33%) had associated cardiac anomalies. Patients with CDLS and CDH had a significantly lower birthweight ($2.2 \pm 0.57\text{kg}$) compared to patients without CDLS ($2.9 \pm 0.64\text{kg}$) ($P < 0.001$). Median 5-minute APGAR scores were significantly lower in the CDLS cohort (6, 4-7) compared to patients without CDLS (7, 5-8) ($P = 0.014$). Only seven patients (33%) underwent surgical repair, compared to 84.2% of patients without CDLS ($P < 0.001$). The mortality rate was 76% (16 patients) for patients with CDLS compared with 29% for patients without CDLS ($P < .0001$). Of the 7 patients with CDLS who were repaired, 5 (71%) survived to hospital discharge.

Conclusion: This report represents the largest series to date of concomitant CDLS and CDH. The prognosis of infants with these simultaneous entities is poor. Despite the significantly lower rate of repair (33% in CDLS, 84.2% in patients without), CDLS patients who are selected to undergo diaphragmatic repair can survive to hospital discharge. These data suggest that the concomitant diagnosis of CDLS and CDH is not necessarily a contraindication to operative repair, though data regarding survival with major morbidity are lacking. Early genetic counseling and recognition of this combination of anomalies may assist with family counseling and prognostication.

IS COMPLEXITY APPROPRIATELY VALUED? ANALYSIS OF PHYSICIAN COMPENSATION IN CARPAL TUNNEL RELEASE PROCEDURES

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Houston Methodist Hospital

Background: Work relative value units (wRVUs) are a derivative of the Relative Value Scale developed by the Center for Medicare and Medicaid Services (CMS). This derivative quantifies operative time, physician labor, training and technical skills required for a specific surgical procedure. It is expected that more complex procedures should be reimbursed at a higher rate. Some authors have found appropriate evaluation for the wRVUs of more complex procedures in comparison to less complex ones, but others cite inconsistencies between wRVUs and procedural effort. Carpal tunnel release (CTR) is a common procedure with over 550,000 cases performed annually in the United States. Currently the endoscopic approach (ECTR) is considered to be more complex when compared to the open approach (OCTR)

Objective: This study aims to analyze surgeon reimbursement in open and endoscopic carpal tunnel release procedures by calculating operative time, wRVUs per minute and dollars per minute

Methods: A retrospective cohort study was conducted over a 3-year period, including all patients that underwent carpal tunnel release at our Institution. Patients were categorized into two groups based on the surgical approach utilized: (1) open and (2) endoscopic carpal tunnel release. Operating time was collected, and calculations of mean operative time, wRVUs per minute, dollars per minute were performed and compared between procedures

Results: A total of 481 cases were identified. The endoscopic approach represented the majority of cases (67.3%, 324 cases) and those with open approach constituted the rest (32.7%, 157 cases). Mean operative time was higher for the endoscopic approach group (16.4 minutes) when compared to the open approach (11.9 minutes) ($p < 0.0001$). Regarding Work RVUs per minute, the mean value was higher for endoscopic cases when compared to open cases (0.60 versus 0.33, respectively). Same was true for the amount of dollars per minute, with endoscopic cases reimbursing more than open procedures ($p < 0.0001$)

Conclusion: Our analysis demonstrated that hand surgeons are appropriately reimbursed for endoscopic carpal tunnel release procedures compared to open cases based on the complexity and operative time of the procedure

Table 1. Reimbursement in open versus endoscopic approach for carpal tunnel release

| | <i>Open</i> <i>n=157</i> | <i>Endoscopic</i> <i>n=324</i> | <i>p-value</i> |
|-------------------------------------|-------------------------------------------|-------------------------------------------------|-----------------------|
| wRVUs, (<i>units</i>) | 4.97 | 6.39 | <0.001 |
| Operative time, (<i>min</i>) | 16.38 (7-34) | 11.91 (5-33) | <0.001 |
| wRVU/min, (<i>units</i>) | 0.33 (0.14-0.71) | 0.60 (0.19-1.72) | <0.001 |
| Dollars/min, (<i>units</i>) | 11.9 (5.27-25.59) | 21.6 (6.98-46.06) | <0.001 |

DOES COMPLEXITY ALWAYS CORRELATES WITH COMPENSATION? AN ANALYSIS OF WORK RELATIVE VALUE UNITS IN THREE COMMON NERVE DECOMPRESSION SYNDROME

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Houston Methodist Hospital

Background: Work relative value units (wRVUs) are part of Resource Based Relative Value Scale system. This component was developed to quantify the time, effort, physician training, and skills needed to complete a specific surgical procedure. It is expected that a more difficult and time-consuming procedure would yield higher wRVUs, translating into a higher compensation for surgeons. Upper limb nerve entrapment syndromes commonly involve the thoracic outlet, cubital tunnel, and carpal tunnel. Studies have shown that prevalence of these nerve entrapment syndromes has been increasing over the years. It is known that thoracic outlet syndrome nerve decompression surgery is a more time consuming and invasive procedure compared to carpal and cubital tunnel corrective procedures. Controversies currently exist regarding the best way to appropriately quantify complexity and to benchmark reimbursement for surgeons.

Objective: The aim of this study is to analyze physician reimbursement in corrective thoracic outlet, cubital and carpal tunnel nerve decompression procedures by comparing mean operative times, wRVUs per minute, and dollars per minute.

Methods: A retrospective cohort study was conducted from June 2016 to June 2019, including all patients that underwent carpal tunnel, cubital tunnel and thoracic outlet release procedures at our institution. Operating time was collected, and calculations of mean operative time, wRVUs per minute, dollars per minute were performed and compared between procedures.

Results: A total of 209 cases were included in the analysis. Carpal tunnel accounted for 75.1 % of the cases (157 cases), followed by cubital tunnel (16%, 35 cases) and thoracic outlet releases (8.1%, 17 cases). Thoracic outlet release had the highest mean operative time at 164.3 minutes. Cubital tunnel release followed with an operative time of 57.1 minutes and carpal tunnel release had the shortest operative time at 16.4 minutes ($p < 0.0001$). Regarding wRVUs per minute, Carpal tunnel release procedures had a significantly higher wRVUs per minute (0.330) when compared with cubital tunnel and thoracic outlet procedures, 0.150 and 0.075 respectively, ($p < 0.0001$). Same was true for dollars per minute; carpal tunnel procedures yielded significantly more compensation than cubital tunnel and thoracic outlet procedures ($p < 0.0001$).

Conclusion: In the presented analysis, more complex and time-consuming procedures yielded a lower reimbursement for physicians. The current work relative unit system does not account adequately for the time spent in each procedure.

| | Carpal Tunnel | Cubital Tunnel | Thoracic Outlet | p-value |
|-----------------------------------------|----------------------|-----------------------|------------------------|----------------|
| Total, n | 157 | 35 | 17 | --- |
| wRVU | 4.97 | 7.26 | 11.40 | <0.0001 |
| Mean Operative Time, min (range) | 16.4 (7-34) | 57.1 (27-137) | 164.3 (93-264) | <0.0001 |
| wRVU/min | 0.330 | 0.150 | 0.075 | <0.0001 |
| wRVU/Hour | 19.81 | 8.98 | 4.50 | <0.0001 |
| \$/min | 11.9 | 5.4 | 2.7 | <0.0001 |
| \$/Hour | 713.9 | 324.1 | 162.3 | <0.0001 |

AXILLARY LYMPH NODE DISSECTION AFTER NEOADJUVANT CHEMOTHERAPY FOR PATIENTS WITH NODE-POSITIVE BREAST CANCER

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Background: Approximately 25% of breast cancer patients receiving neoadjuvant chemotherapy (NCT) will have a pathologic complete response (pCR). Patients with node-positive breast cancer have traditionally undergone axillary lymph node dissection (ALND), but surgical practices are shifting with many centers offering less extensive surgery to selected patients after NCT.

Objective: This study aims to quantitate residual axillary lymph node disease after NCT and identify factors predicting a pCR.

Methods: A retrospective review of a prospectively maintained surgical database identified women who underwent ALND for breast cancer from 2015 to 2019 at Ben Taub Hospital. Only women who presented with positive lymph nodes and received NCT were included. Data including clinical stage at presentation, molecular subtype, treatment, and pathologic stage was collected.

Results: One hundred and thirteen patients met study criteria. The average age of the patients was 50 years old. The majority of the patients were Hispanic (70.8%) and most patients had infiltrating ductal carcinoma (97.3%). Most of the patients were clinical stage 3 at diagnosis (45.1%). 77% of patients were nodal stage 1 at diagnosis. For the entire cohort, 48% had no residual axillary metastases at the time of surgery following NCT. This effect was most frequent in patients with triple-negative (64%) and HER2+ (59%) cancers compared to those with hormone receptor positive, HER2- cancers (23%). 32% of patients in the cohort achieved a pCR at the time of surgery following NCT. pCR was found to be most frequent in patients with HER2+ (43.9%) and triple-negative (42.4%) cancers compared to those with hormone receptor positive, HER2- cancers (10.3%).

Conclusion: Breast cancer patients with axillary lymph node metastases frequently convert to node-negative after NCT, especially those with triple-negative and HER2-positive breast cancers. However, our ability to predict whether or not significant axillary residual disease remains after NCT is limited. Further analysis of clinicopathologic characteristics will be performed in order to better identify factors predicting pCR.

| pCR Status by Breast Cancer Subtype | | | | |
|--------------------------------------------|---------------------|------------------------|----------------------|-----------------------------------|
| pCR Status | All patients | Triple-negative | HER2-positive | HR positive, HER2-negative |
| | n=113 (%) | n=33 (%) | n=41 (%) | n=39 (%) |
| pCR both breast and axilla | 36 (31.9) | 14 (42.4) | 11 (43.9) | 9 (10.3) |
| pCR axilla only | 18 (15.9) | 7 (21.1) | 3 (4.9) | 7 (12.8) |
| pCR breast only | 7 (6.2) | 1 (3.03) | 2 (48.8) | 2 (10.3) |
| no pCR | 52 (46) | 11 (33.3) | 15 (36.6) | 26 (66.7) |

CLINICAL SIGNIFICANCE OF NEUTROPHILS-LYMPHOCYTES RATIO AND PLATELETS-LYMPHOCYTES RATIO IN PATIENTS WITH RESECTABLE PANCREATIC CANCER

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Houston Methodist Hospital

Background: Pancreatic cancer is currently the 4th leading cause of cancer mortality in the United States, and predicted to climb to the 2nd leading cause of death for cancer by 2030 as its incidence is projected to rise. Pancreatic ductal adenocarcinoma (PDAC) accounts for approximately 85% of all pancreatic cancer. The overall 5-year survival remains unchanged at 8%. Early diagnosis markers are being studied to help predict prognosis and guide management. Neutrophil-lymphocyte ratio (NLR), and platelet-lymphocyte ratio (PLR) have been shown to predict prognosis in patients with resectable, borderline-resectable, and metastatic pancreatic adenocarcinoma.

Objective: In our study we aimed at verifying the prognostic values of identified early diagnostic markers in a population of patients who underwent upfront surgery for PDAC.

Methods: Data were collected retrospectively on patients with pathology-proven pancreatic ductal carcinoma (PDAC) who underwent upfront pancreatic resection between February 2016 and March 2019 at our Institution. Laboratory data on the day of surgery or in the days immediately preceding were used to calculate NLR and PLR.

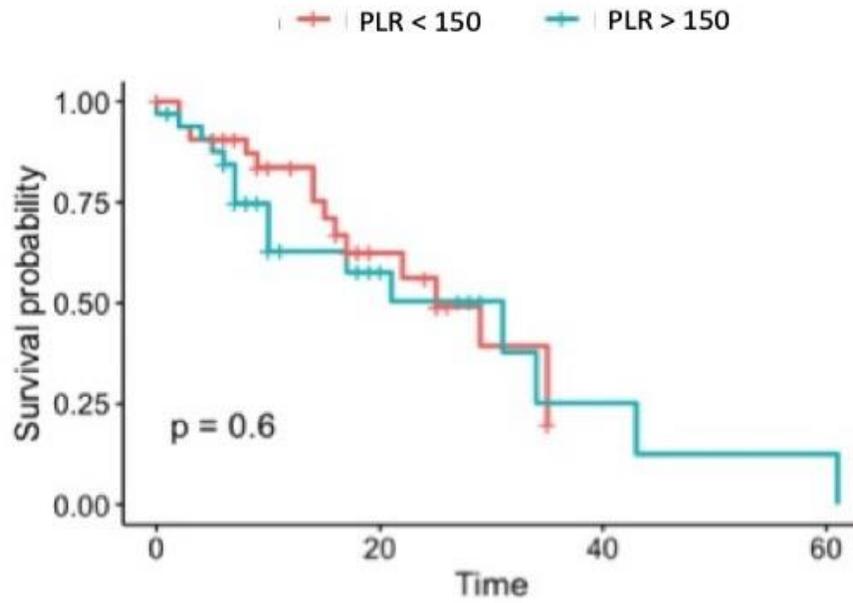
To test the prognostic significance of NLR and PLR in the overall survival (OS) of our population, patients were divided on low vs. high risk using pre-specified cut-offs for both parameters based on previously published data - specifically $NLR > 5$ and $PLR > 150$ indicating poorer prognosis.

Results: Retrospective analysis of the Institution dataset yielded a total of 67 patients meeting the inclusion criteria. Median age at diagnosis was 66 years (61 – 74 years); 49.3% were men. The median NLR and PLR preoperative were 2.86 (1.74 – 4.4) and 234 (190 - 291) respectively. The median OS of the global population was 11 months (7 - 22). On Kaplan Meyer analysis, OS survival was not different among patient with high or low NLR ($p=0.98$) or patient with high or low PLR ($p=0.6$).

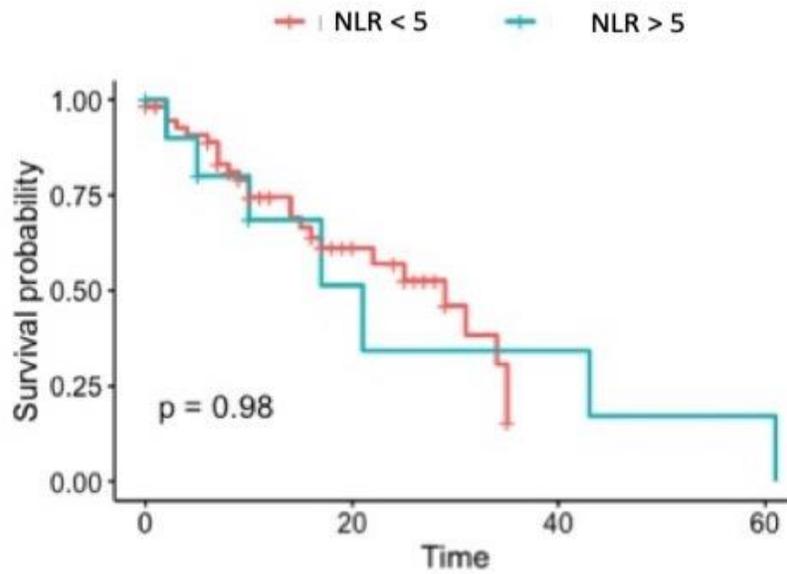
Conclusion: In our population, NLR and PLR, dichotomized as previously suggested in the literature, did not show significant prognostic value on OS in patients with resectable PDAC. The OS of PDAC patients likely depends on complex multifactorial interactions, difficult to capture and condense in one single marker.

Graphs on following page

PLATELETS-TO-LYMPHOCYTES RATIO (PLR)



NEUTROPHILS-TO-LYMPHOCYTES RATIO (PLR)



THE PROGNOSTIC VALUE OF ALBUMIN IN THE TREATMENT OF UNRESECTABLE HEPATOCELLULAR CARCINOMA

S Sanjeevi, C DuncaN, K McElroy, N Bhadkamkar, R Zvavanjanja, C Wray
University of Texas HSC - Houston

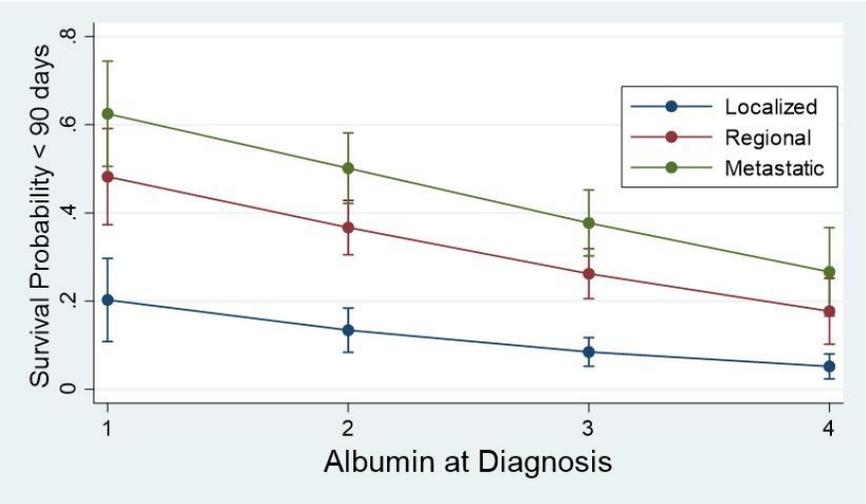
Background: The utility of transarterial chemoembolization (TACE) for unresectable hepatocellular carcinoma (HCC) in the setting of advanced cirrhosis is questionable. Current HCC prognostic models include parameters of liver dysfunction and those related to HCC. This heterogeneity may impact the clinical utility of current prognostic treatment models.

Objective: We hypothesize that the serum albumin level at diagnosis independently predicts 90-day mortality of HCC.

Methods: Our institutional registry was queried for all HCC cases treated with TACE, chemotherapy and best supportive care (BSC). Patients undergoing surgery or ablation were excluded. Standard demographic and clinical variables were included. Inverse probability of treatment weighted propensity scores was created using age, stage, gender, AFP, albumin, Model for End-Stage Liver Disease (MELD) score at diagnosis and time period were modelled to estimate survival. A logistic regression model was created to identify variables associated with survival less than 90 days

Results: 1127 HCC patients comprised this study. TACE was performed on 277 (27%), chemotherapy only 198 (16%), BSC 682 (56%) and 123 patients received both (10%). In those treated with TACE, variables associated with survival<90 days included MELD (OR 1.06, 95%CI:1.03-1.10, p<0.01) and regional stage (OR 2.27, 95%CI:1.35-3.82, p<0.01), albumin (OR 0.58, 95%CI:0.43-0.78, p<0.01). For those receiving TACE and albumin<3 at diagnosis, the probability of survival<90 days by stage was 25% (regional) and 38% (metastatic) (Figure 1). The estimated mean survival was 11.4 months (95%CI:9.91-12.8, p<0.01) for patients treated with BSC. TACE increased mean survival an additional 8.8 months (95%CI:5.44-12.2, p<0.01).

Conclusion: Locoregional TACE significantly improved survival when compared to BSC. As MELD score increases and albumin decreases, the TACE survival benefit diminishes significantly for unresectable HCC. Using this model serum albumin at diagnosis is predictive of 90 day survival across all stages of HCC.



SOCIAL MEDIA PRESENCE OF VASCULAR SURGERY

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Background: The Internet has become a popular platform for patients to obtain information and review the providers they interact with. However, little is known on the digital footprint of vascular surgeons and their interactivity with patients on social media.

Objective: We aim to understand the activity of academic vascular surgeon on physician rating websites.

Methods: Information on attending vascular surgeons affiliated with vascular residency or fellowships in the Southern Association for Vascular Surgery were collected. Websites containing physician rating was obtained via literature review and google search. Open access websites that contain either qualitative or quantitative evaluation of vascular surgeons within the SAVS region were included. Ranking agencies and closed access websites were excluded. Ranking scores from each website were converted to standard 5-point scale for comparison. Data analysis was performed using R.

Results: A total 5436 quantitative and 946 qualitative reviews were written for 287 physicians (222 male, 77.4%) across 16 websites that met inclusion criteria (N=64). Surgeons in the SAVS region had profiles on a median of 8 (IQR; 6-10) website with only one surgeon having zero profiles. Yellowbot was the least represented (48, 17%) while Caredash listed the most (258, 90%). Over 80% of profiles on Yelp, Local, Yellowbook, Yellowbot, and RateMD had less than 50% of the requested information or not more than address and contact of the practice. Most (73%) physician profiles were accurate reflecting correct demographic affiliations and practice. The median number of quantitative reviews was 11 (1.5-24) and qualitative reviews was 2 (0-5). The physician with most quantitative reviews had 138 reviews across 11 websites and most qualitative review had 28. Seventeen percent of physicians had zero quantitative reviews and 32% had zero qualitative review. About half of the physicians have more than 10 reviews across 16 PRW. Vitals and Healthgrades were the only sites where over half of the physicians had at least one quantitative review. They were also the two websites that had most reviews: Vital had 1657 quantitative review and 467 qualitative reviews, Healthgrades had 1166 quantitative review and 296 qualitative reviews. The median score for quantitative review was 3.2 (IQR; 2.3, 4). Most qualitative reviews by patients were positive 741, followed by 191 negative reviews, and 24 neutral reviews (N=785). No physician responded to patient's reviews.

Conclusion: Vascular representation on physician rating websites is varied with the majority of vascular surgeons only represented on the top half of the physician rating websites. The number of quantitative and qualitative reviews are low. No surgeon responded to reviews. The activity of vascular surgeons in this area of social media is low and reflects a small digital footprint that patients can reach and review.

IMPLEMENTATION OF A SURGICAL WELLNESS EMOTIONAL AWARENESS AND RESILIENCY (SWEAR) TRAINING CURRICULUM IN SURGICAL EDUCATION; SWEAR TRAINING

K Chambers, K Aguirre, A Kara, B Davis
Texas Tech University HSC - El Paso

Background: Background: Physician burnout is a growing concern in the medical community. Growing evidence in graduate medical education literature points to surgical residency as a period of high risk for physician burnout.

Objective: Objective: This study implemented a wellness curriculum to surgery residents in order to teach trainee stress management skills and coping mechanisms. It was also expected that the life skills learned during SWEAR Training would benefit our trainees throughout their career development.

Methods: Methods: A total of 18 surgical residents were included in this study and surveyed on scores of Compassion, Mindfulness, Resilience and Stress before and after the curriculum.

Results: Results: Of the 7 participants who did complete the pretest and posttest surveys, 6 were males and 1 female had an average age of 30.9 years (SD = 1.6). While there was no significant difference in the pretest and posttest for any scores, we found significant correlations between age and empathy (pretest), $r=0.485$, $n=18$, $p=0.041$, and age and compassion (pretest), $r(18)=0.518$, $p=0.028$. There was a negative correlation between age and stress (pretest), $r(18)=-0.809$, $p < 0.001$. We found that compassion positively correlated with mindfulness (pretest), $r(18)=0.756$, $p < 0.001$ and negative correlated with stress (pretest), $r(18)=-0.706$, $p=0.001$. Mindfulness was also positively correlated with resilience (pretest), $r(18)=0.514$, $p=0.029$.

Conclusion: Conclusion: Surgical residents work and train in complex environments involving uncertainty, stress, multitasking, risks, ambiguity, time strains, distractions and communications with other healthcare professionals. We may not have found differences in the posttest due to participant attrition. However, the relationship between age and burnout as well as empathy, compassion, mindfulness, resilience and stress should be considered in interpreting the findings in future studies with a much larger sample size. The issue of resident burnout is of utmost importance to graduate medical education and further studies should investigate better ways of preventing and alleviating the effects.

ACUTE MICROGLIAL REACTIVITY AFTER TRAUMATIC BRAIN INJURY: REDUCING HIGH DIMENSION MULTICOLOR FLOW CYTOMETRY TO MAP MICROGLIA PHENOTYPES

Henry W. Caplan, M.D., Naama E. Toledano-Furman, Ph.D., Karthik S. Prabhakara, M.S., Nicolas F. Moreno, B.S., Andrea S. Bordt, M.S., Sanjana Udtha, Scott D. Olson, Ph.D., and Charles S. Cox, Jr M.D.

University of Texas HSC - Houston

Background: Traumatic brain injury (TBI) causes a profound inflammatory-mediated response within the brain that contributes to significant long-term morbidity. Microglia are resident immune cells in the brain and key mediators of the inflammatory response in the central nervous system (CNS) after injury. They are a key target for intervention in TBI, as well as nervous system pathologies.

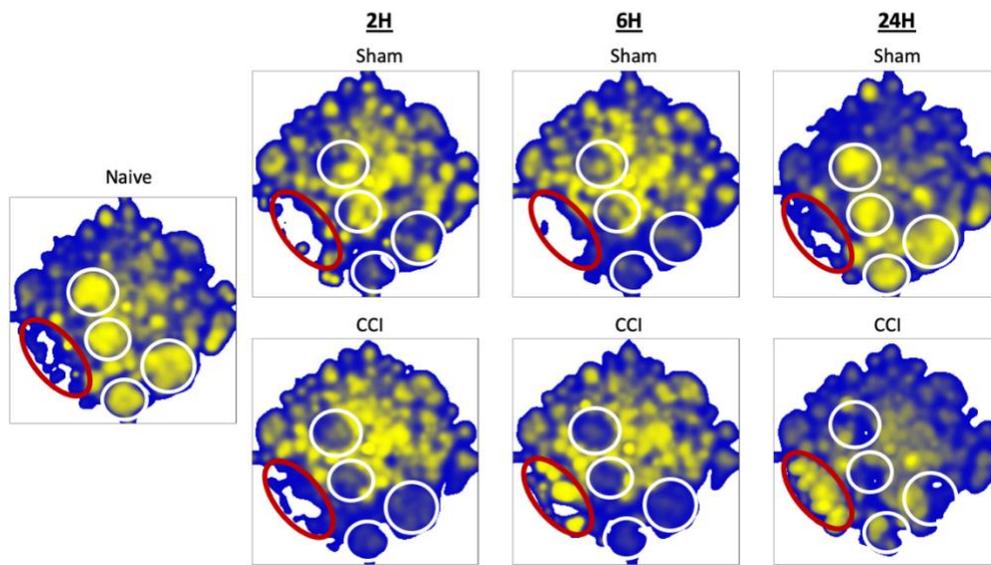
Objective: To improve potential therapies, we investigated acute microglia reactivity in a rat CCI model.

Methods: Animals were randomized to naïve sham, or cortical contusion injury (CCI). The brains were harvested at 3 time points after injury: 2, 6, or 24 hours. Flow cytometry and t-Distributed Stochastic Neighbor Embedding (t-SNE) analysis were performed on all samples.

Results: Using a combination of traditional flow cytometry immunophenotyping and t-SNE, a computational dimension reduction technique that aids in analysis and visualization of high-dimensional flow cytometry data, we demonstrate significant and progressive microglia reactivity starting as early as 6 hours after CCI in our rodent model. Furthermore, the reactive microglia have significantly elevated CD45 expression, traditionally thought to be an exclusive property of peripheral macrophages.

Conclusion: t-SNE can effectively reduce high-dimension flow cytometry data and provide visualization of distinct microglia cell populations, thus improving our traditional flow cytometry analysis. In addition, in flow cytometry immunophenotyping, CD45 does not effectively distinguish reactive microglia from peripheral myeloid cells in the acute time period after CCI.

t-SNE density plots demonstrate changes in cell populations after CCI over time



HUMAN UMBILICAL CORD BLOOD REGULATORY T CELLS INHIBIT PROINFLAMMATORY IMMUNE RESPONSES IN A TGF- β DEPENDENT AND IL-10 INDEPENDENT MANNER IN VITRO.

H Caplan, K Prabhakara, S Olson, C Cox
University of Texas HSC - Houston

Background: Regulatory T cells (Treg) are a subset of T cells that confer tolerance, prevent autoimmunity and suppress excessive endogenous inflammatory responses. In a preclinical model of traumatic brain injury (TBI), we have demonstrated that umbilical cord blood (UCB) Treg can attenuate chronic microglia activation. However, the methods by which Treg act are still under investigation. Both IL-10 and TGF- β have been purported as important mediators of Treg efficacy.

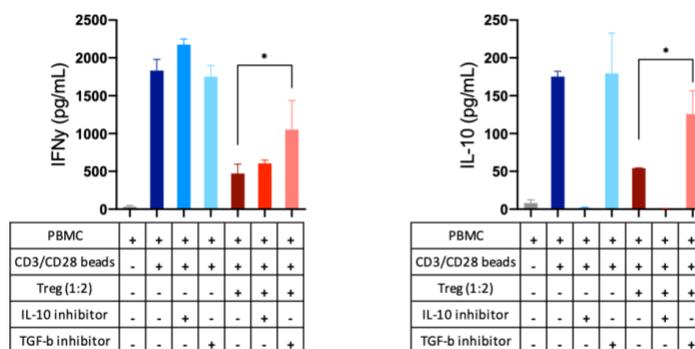
Objective: Here, we sought to investigate the roles of IL-10 and TGF- β in Treg inhibition of proinflammatory cytokine production.

Methods: Treg were isolated from UCB via Ficoll separation and magnetic bead sorting. They were cultured with anti-CD3, anti-CD28 beads, IL-2, rapamycin supplementation. Cells were re-stimulated on day 14 and cryopreserved on day 21.

Human PBMC (PBMC) were isolated from peripheral blood using Ficoll separation. They were stimulated with anti-CD3/CD28 beads and co-cultured with Treg. IL-10 and TGF- β inhibitors were added to selected wells. Cell culture supernatant was collected after 48 hours, and ELISA was performed for human IFN γ and IL-10.

Results: Activated PBMC produce IFN γ in an IL-10 and TGF- β independent manner. Treg significantly inhibit both IFN γ and IL-10 production by activated PBMC. IL-10 inhibition did not alter Treg ability to inhibit IFN γ production. TGF- β inhibition significantly decreased the ability of Treg to suppress both IFN γ and IL-10 production.

Conclusion: Human UCB Treg inhibit proinflammatory cytokine production in a TGF- β dependent and IL-10 independent manner in vitro.



BIOAVAILABILITY EVALUATION OF HARVESTED SWINE (SUS SCROFA) FORELIMBS FOLLOWING 24 HOURS OF MACHINE PERFUSION USING THE ULISSSES PLATFORM

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University of Texas Medical Center - San Antonio

Background: Modern day military warfare has yielded an increase in the incidence of traumatic limb amputations and proximal complex wounds. Many of these patients have concomitant polytrauma that preclude them from tolerating an immediate surgery for re-implantation; therefore, a method which allows preservation of tissue will significantly impact the success of re-implantation. Current methods of preservation are based on cold static preservation (CSP); which results in ischemia related tissue loss and reperfusion injury upon re-implantation. In addition, CSP methods are limited to 4-6 hours. The objective of the proposed project is to extend the duration of successful tissue preservation to >24 hours using a novel device, which utilizes a combination of fluidics and mechano-elastic principles for normothermic oxygenated perfusion. The Universal Limb Stasis System for Extended Storage (ULiSSES) is a modular, lightweight, and portable vascular perfusion device designed specifically for the military setting.

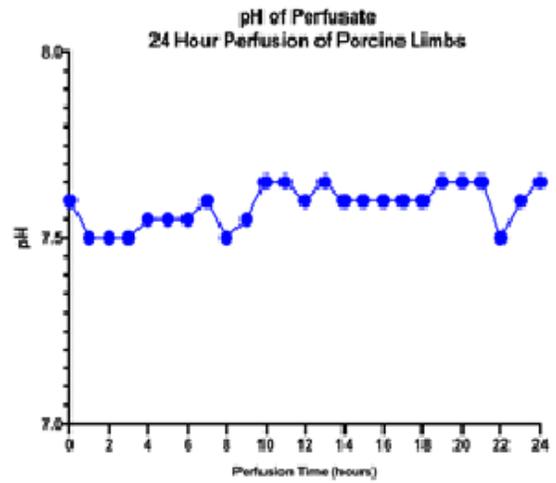
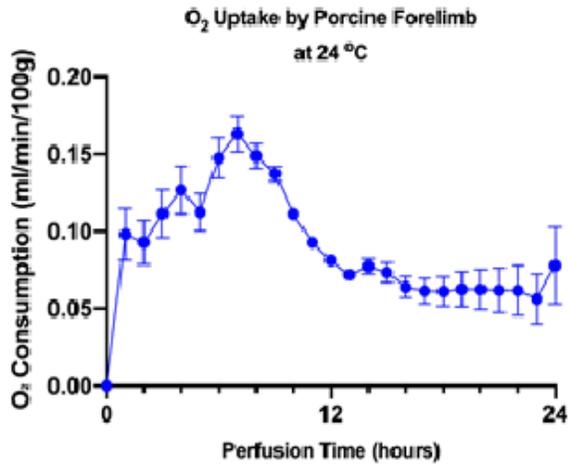
Objective: To assess the 24 hour tissue viability provided by perfusing a porcine forelimb vascularized composite allotransplantation model using the ULiSSES prototype technology.

Methods: Amputated porcine forelimbs were utilized to evaluate the ULiSSES device. After amputation, the forelimbs underwent continuous perfusion with oxygenated perfusate of Krebs-Henseleit solution for 24 hours. Perfusate flow, pressure, pH and oxygenation levels were monitored continuously. These measures of tissue viability were compared to six hours of cold storage.

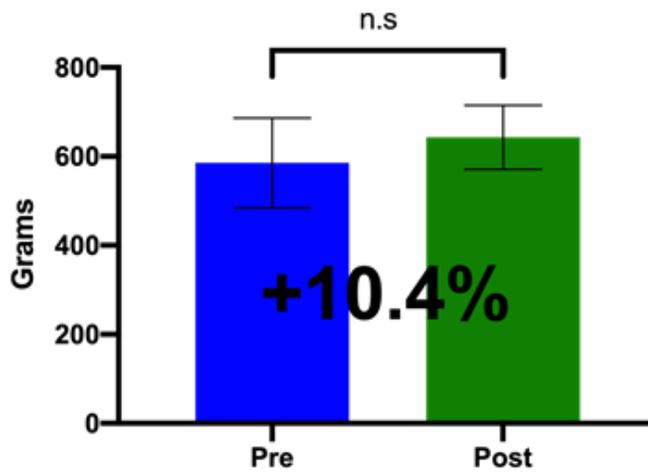
Results: The porcine forelimbs perfused with the ULiSSES demonstrated an initial hyperemia like oxygen consumption, followed by stabilization. Additionally, a stable pH was observed for the 24 hour duration of preservation time utilizing ULiSSES. Moreover, the ULiSSES forelimb specimens demonstrated only a 10.4% weight gain over the 24 hours.

Conclusion: Although there are no current options for extended tissue preservation time to optimize re-implantation for military service members whom sustain polytraumatic injuries, the ULiSSES device shows promise with the ability to maintain perfusion, oxygenation, and tissue viability for up to and potentially greater than 24 hours. This novel, non-electric reliant, portable, normothermic oxygenating perfusion device has significant relevance to both the civilian and military environments.

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Weight Gain 24 Hour Perfusion of Porcine Limb



CONTEMPORARY EPIDEMIOLOGY, MANAGEMENT AND OUTCOMES OF BRACHIAL ARTERY INJURIES

Jack C. Webb, BS; Joseph J. DuBose, MD; Carlos V. R. Brown, MD; John B. Holcomb, MD; John Sharpe, MD; Jonathan J Morrison, MD, PhD; Thomas M. Scalea, MD; David Skarupa, MD; Richard D. Catalano, MD; Jennie Kim, MD; Kenji Inaba, MD; Nathaniel Poulin, MD; John Myers, MD; John K. Bini, MD; Pedro G. R. Teixeira, MD
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Background: Ongoing progress and dissemination of endovascular techniques have brought this treatment modality to the trauma setting, with endovascular approach now being used to treat injuries in a variety of arterial locations.

Objective: The aim of this study was to use a multicenter AAST prospective registry to provide a contemporary assessment of the epidemiology of brachial artery injuries and identify management trends and current outcomes.

Methods: All patients with a brachial artery injury in the registry (2013-2018) were identified. Patients with other associated arterial injuries in the upper extremities were excluded. Variables collected included demographics, presentation vital signs and GCS, injury severity scores, fluids and blood products utilization, use of systemic anticoagulation and antiplatelet therapy, management strategy (nonoperative, open repair and endovascular repair). Outcomes included mortality, amputation, need for reoperation, fasciotomy.

Results: During a 6-year period, 233 patients with a brachial injury were admitted to the 22 trauma centers contributing with data for the registry. Patients were on average 32±8 years old, mostly males (79%), sustaining a penetrating mechanism (73%). At presentation 11% were hypotensive and 12% had a GCS ≤8. Hard signs of vascular injury were present in 75% of the patients. Associated fracture was present in 31% of the cases. The brachial artery injury was diagnosed on surgical exploration in 76% of the cases. Imaging modalities used for those who required diagnostic confirmation included CT angiogram (74%), duplex ultrasound (14%) and angiogram (12%). Most injuries were a complete transection (70%), followed by occlusion (18%), flow limiting defect (10%) and pseudoaneurysm (2%). Open repair was the treatment of choice in 93% of the patients (65% had an interposition graft using autogenous vein, 31% were primarily repaired and 2% had an interposition with synthetic graft). Procedural systemic anticoagulation was used in 60% of the cases. Only 5 patients (2%) underwent endovascular repair with an endostent graft. Overall, 18% underwent a fasciotomy (40% prophylactic, 58% therapeutic at the initial operation, and 2% therapeutic at a subsequent operation). Definitive closure was achieved in 68% of the fasciotomies. Mortality was 5% and amputation rate 2%. Ten percent of the patients required reintervention.

Conclusion: Despite advances in endovascular techniques, the management of brachial artery injuries remains primarily operative, with most patients requiring an interposition graft.

DOES BIPAP AFFECT INTUBATION RATES IN TRAUMA PATIENTS WITH RESPIRATORY FAILURE?

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Background: Acute respiratory failure is the leading cause of emergency admissions in the U.S., with a mortality of 20% and an annual cost of \$54 billion. The role of noninvasive positive pressure ventilation (NPPV) to treat acute respiratory failure and avoid intubation is controversial. A literature review on the topic produces conflicting results. Numerous randomized trials showed no protective effect of NPPV on de novo intubation or reintubation rates, while other trials showed the opposite. There is also a paucity of data specific to trauma patients.

Objective: To analyze the de novo intubation and reintubation rates of trauma patients that receive Bilevel Positive Airway Pressure (BiPAP) for acute respiratory failure.

Methods: We conducted a retrospective single-center review of all adult trauma patients admitted to our Level I trauma center from March 2013 to December 2018 that received BiPAP for acute respiratory failure during their hospital stay. The primary outcome was the need for subsequent endotracheal intubation and the secondary outcomes included mortality, length of stay, and vent days.

Results: There were 52 patients who underwent BiPAP for respiratory failure during the study period. The patients were on average 63 years old, 71% male, 98% sustained blunt trauma, moderately injured with an ISS=19, and had a BMI of 31. BiPAP was successful in avoiding endotracheal intubation in 33 patients (63%). Patients in whom BiPAP was successful were more often white (91% vs. 68%, $p=0.04$), had a higher admission systolic blood pressure (147 vs. 129, $p=0.04$), and had a lower ISS (16 vs. 25, $p=0.007$). After logistic regression the only variable associated with BiPAP success was Caucasian race (OR: 0.15, 95% CI: 0.02-0.9, $p=0.04$). Patients who failed BiPAP therapy and required subsequent endotracheal intubation had no statistical difference in mortality (11% vs. 3%, $p=0.55$) but spent more days in the ICU (12 vs. 3, $p<0.0001$), on the ventilator (7 vs. 1, $p<0.0001$), and in the hospital (21 vs. 14, $p=0.01$).

Conclusion: BiPAP was successful in avoiding intubation in almost two-thirds of trauma patients with respiratory failure. Race, admission hemodynamics, and severity of injury appear to play a role in successful application of BiPAP therapy. Though BiPAP can avoid endotracheal intubation in the majority of trauma patients with respiratory failure, a better understanding of who is likely to benefit is necessary as failure of BiPAP therapy is associated with significantly worse outcomes.

OUTCOME IMPLICATIONS OF VENOUS MANAGEMENT STRATEGY IN PATIENTS WITH CONCOMITANT ARTERIAL AND VENOUS FEMOROPOPLITEAL INJURIES

Jack C. Webb, BS; Pedro G. R. Teixeira, MD; Joseph J. DuBose, MD; Carlos V. R. Brown, MD; John B. Holcomb, MD; John Sharpe, MD; Jonathan J Morrison, MD, PhD; Thomas M. Scalea, MD; David Skarupa, MD; Richard D. Catalano, MD; Jennie Kim, MD; Kenji Inaba, MD; Nathaniel Poulin, MD; John Myers, MD; John K. Bini, MD; David Feliciano, MD
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Background: Optimal management for associated venous injuries encountered during repair of arterial femoropopliteal injuries is controversial and it remains unclear whether potentially complex venous reconstructions are warranted.

Objective: The aim of this study was to evaluate how the management of associated venous injuries impacted the outcome of patients with femoropopliteal arterial injuries using a multicenter prospective registry.

Methods: All patients with combined arterial and venous femoropopliteal injuries in the prospective registry (2013-2018) were identified and those with documentation of management of the venous injury were included in the study. Patient demographics, presenting physiology, injury severity scores, fluids and blood products utilization, use of systemic anticoagulation and antiplatelet therapy were abstracted. The population was stratified by venous management strategy (Vein Ligation [VL] versus Vein Repair [VR]) and compared with univariate analysis. The primary outcome was failure of the arterial repair. Secondary outcomes included amputation, need for reintervention, need for fasciotomy, and definitive fasciotomy closure.

Results: Over 6 years, 40 patients with combined arterial and venous femoropopliteal injuries and documented venous injury management strategy were admitted to participating 22 trauma centers. The associated venous injury was treated with ligation in 18 (45%) and repair in 22 (55%) patients. Patients in both groups were not significantly different (Table). Patient undergoing VR had higher arterial repair failure rates (18.2% vs 5.6%), need for reintervention (22.7% vs 11.1%) and amputation (18.2% vs 5.6%), but none of these differences were statistically significant. VL patients were more likely to undergo a prophylactic fasciotomy (55.6% vs. 18.2%, OR[95% CI]: 5.62[1.34-23.44], $p=0.01$), however significantly more patients in the VR group required a therapeutic fasciotomy, with the resulting total fasciotomy rates being comparable in both groups (88.9% vs 77.3%, OR[95% CI]: 2.35[0.39-13.90], $p=0.42$). Fasciotomy closure was achieved 75.0% in the VL group compared to 64.7% in the VR group ($p=0.70$).

Conclusion: For patients with combined femoropopliteal arterial and venous injury, venous repair offered no outcome benefit compared to venous ligation. Patients undergoing venous ligation received more prophylactic fasciotomies, but the overall need for fasciotomy was not different due to more therapeutic fasciotomies being performed in the patients with a vein repair.

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| Variables | Repair (n=22) | Ligation (n=18) | p- value |
|--------------------------|------------------|--------------------|-------------|
| Age | 32.6±13.0 | 29.6±13.5 | 0.72 |
| Male sex | 81.8% | 100% | 0.14 |
| Penetrating | 72.7% | 83.3% | 0.47 |
| SBP <90 mmHg | 13.6% | 16.7% | 1.00 |
| GCS ≤8 | 9.1% | 5.6% | 1.00 |
| ISS ≥16 | 50.0% | 55.6% | 0.73 |
| Head AIS ≥4 | 0% | 0% | 1.00 |
| Chest AIS ≥4 | 4.5% | 0% | 1.00 |
| Abdomen AIS ≥4 | 4.5% | 0% | 1.00 |
| Extremity AIS ≥4 | 40.9% | 50.0% | 0.56 |
| Hemoglobin | 11.5±2.0 | 11.8±2.0 | 0.65 |
| pH <7.2 | 18.2% | 22.2% | 1.00 |
| Lactate >4 | 59.1% | 55.6% | 0.82 |
| INR >1.5 | 13.6% | 11.1% | 1.00 |
| Total PRBC in 24hr | 6.9±9.0 | 6.9±6.7 | 0.91 |
| Massive Transfusion | 31.8% | 27.8% | 0.78 |
| Time to operation | | | |
| < 1 hour | 4.5% | 11.1% | 0.07 |
| 1-3 hours | 36.4% | 33.3% | |
| 3-6 hours | 50.0% | 44.4 | |
| >6 hours | 9.1% | 11.1% | |
| Operation length | | | |
| 1-3 hours | 27.3% | 22.2% | 0.91 |
| 3-6 hours | 50.0% | 61.1% | |
| >6 hours | 22.7% | 16.7% | |
| Perioperative fluids | | | |
| Crystalloids, L | 3.31±2.36 | 3.04±2.68 | 0.73 |
| PRBC, units | 6.1±9.4 | 4.6±4.7 | 0.54 |
| FFP, units | 3.1±7.2 | 2.1±3.1 | 0.57 |
| Platelets, units | 0.7±1.5 | 0.4±0.9 | 0.47 |
| Intra-op anticoagulation | 81.8% | 83.3% | 1.00 |
| Post-op anticoagulation | 81.8% | 66.7% | 0.30 |
| Post-op antiplatelet | 45.5% | 50.0% | 0.77 |
| Post-op anti-thrombotic | 90.9% | 72.2% | 0.21 |

PATTERNS AND MANAGEMENT OF MAXILLOFACIAL TRAUMA IN TEXAS INMATES

Background: The incidence of trauma in the Texas Department of Criminal Justice is at a significantly higher rate than the general population, mainly due to acts of violence. Few reports in the literature address the type of injuries sustained by inmates. Even less is reported on the kind of maxillofacial trauma sustained in this population. In 2015, Henning et al. studied the pattern of traumatic injuries in New York City inmates. They found that facial fractures represent 61.4% of all injuries, with mandible fractures being the most common.

Objective: Investigate the pattern and the management of maxillofacial trauma for inmates in the Texas Department of Criminal Justice who were treated at The University of Texas Medical Branch Hospital.

Methods: Data was collected for all subjects who sustained maxillofacial trauma and were treated by the Division of Oral and Maxillofacial Surgery at the University of Texas Medical Branch from June 1, 2008, to June 1, 2019. The data analysis was retrospective, and the statistical analysis was descriptive.

Results: Overall, 514 patients were included in the study. The most common pattern of craniofacial trauma was mandible fractures, followed by the zygomaticomaxillary complex (ZMC) fractures. We have identified several challenges in the management of this population; these included inconsistent mechanisms of injury with each type of the fracture, delayed presentation, inadequate treatment from other services, complicating medical factors, and difficulty in follow-up logistics.

Conclusion: The results of this study showed that mandible fractures are the most common sustained injury in inmates of the Texas Department of Criminal Justice. Also, we identified several challenges in the management of these patients, which can be improved to provide better overall care.

PEDIATRIC RESIDENT ATTITUDES AND PRACTICES REGARDING FIREARM SAFETY GUIDANCE

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Background: Firearm injuries in children are the second leading cause of death. Pediatricians routinely provide anticipatory guidance regarding child safety and injury prevention, which begins during pediatric residency. However, firearm safety anticipatory guidance is rarely delivered.

Objective: Given the recent increase in unintentional firearm injuries in children, the purpose of this study was to assess attitudes and practices regarding delivery of safe firearm safety guidance (FSG) by pediatric residents.

Methods: A cross-sectional survey of pediatric resident providers training at an urban academic hospital was performed. In addition, a systematic review of the literature was performed regarding firearm safety guidance (FSG) provided in pediatric residency programs. Results were analyzed using descriptive statistics and chi-square analysis.

Results: Surveys were returned by 70 pediatric residents, of which 17% own firearms. Seventy-six percent of residents reported that unintentional shootings and suicides are prevalent in children in their community. While 99% of residents felt that discussing firearm safety with parents is necessary, only 41% reported regularly providing FSG. The most common barriers were insufficient time during well-child checks (67%) and lack of comfort of non-firearm owners (36%). The majority (84%) of residents reported that if trained, they would incorporate this counseling into their practices. The systematic review identified only two studies addressing firearm safety curriculum in pediatric residency programs. In both, FSG was not covered by the majority of residency programs (56% and 35%), despite program directors feeling that this topic was important. Barriers included lack of trained personnel and educational resources and time constraints.

Conclusion: Pediatric residents believe that safe firearm storage counseling is important, but do not routinely provide it due to time constraints and lack of comfort. There are few residency programs teaching this guidance. Tools for providing effective and time-efficient firearm safety counseling training should be developed for providers and added to pediatric residency curriculums.

TRAUMA AT THE BORDER: A DESCRIPTIVE ANALYSIS OF INJURIES AMONG UNITED STATES BORDER PATROL AGENTS

Brittany L. Johnson, MD, Avni Bhalakia, MD, Annalyn DeMello, RN, Kristin Beckworth, MPH, Bindi J. Naik-Mathuria, MD, MPH
Baylor College of Medicine

Background: The United States (U.S.) shares its southern-most border with Mexico, the majority of which is shared by Texas. The responsibility of defending this southern border belongs to a multitude of agencies: U.S. Customs and Border Protection (CBP), U.S. Immigration and Customs Enforcement (ICE) and Border Patrol Search, Trauma and Rescue (BORSTAR).

Objective: Given the large workforce and the paucity of data regarding injuries sustained by U.S. border patrol agents, we sought to identify and characterize injuries sustained by border patrol agents using a national dataset.

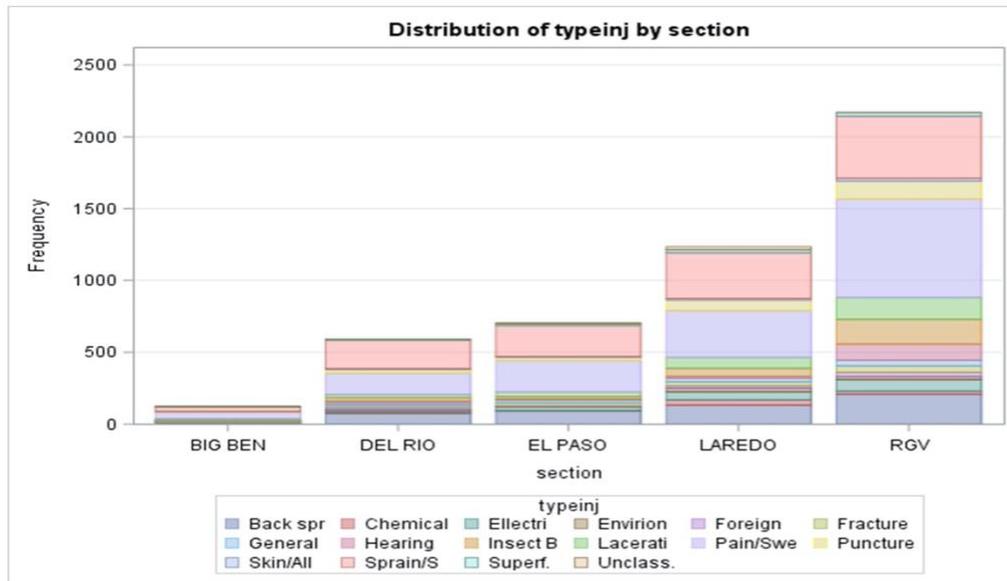
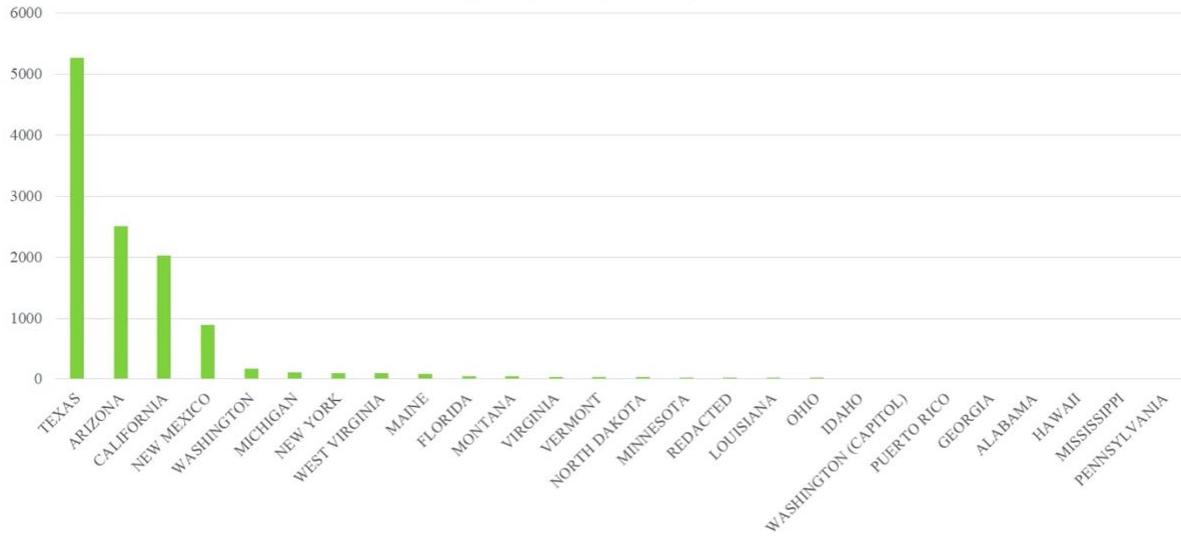
Methods: The U.S. Department of Labor's Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation dataset (CA-1 form) was queried from 2015-2017 to identify injuries, including mechanism of injury and location of injury incurred by border patrol agents. Injuries were classified according to the Division of Federal Employee's Compensation (DFEC)'s codes.

Results: During this 3-year period, 10,556 reported Border Patrol Agent injuries were identified. The highest number of injuries occurred in the states of Texas (47%), Arizona (23%), California (19%), New Mexico (8%) and Washington (2%). A high preponderance of general musculoskeletal injuries occurred secondary to slips and falls. 6,495 (62%) of injuries resulted from a traumatic event; 386 (4%) injuries were violence related. Common mechanisms of these injuries included slips and falls, animal and insect bites, and vehicular accidents with many injuries recorded as unknown mechanism.

Conclusion: Border Patrol Agents along the U.S.-Mexico border sustain a variety of injuries ranging from muscle strains and lacerations to puncture wounds and fractures. Violence related injuries were a minority of the cases recorded. Further studies are vital in order to understand and subsequently provide optimal care for our country's border patrol agents.

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Frequency of Injuries by States



MULTI-DISCIPLINARY TRAINING FOR SURGICAL RESIDENTS IN A MASS CASUALTY SHOOTING EVENT

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University of Texas Rio Grande Valley

Background: The Hartford Consensus was initiated in April 2013 by medical, law enforcement and first responder communities to improve survivability from mass casualty shooting events, recognizing active shooter and mass casualty events as a reality of modern American life.

Objective: Our aim was to evaluate the impact of The Hartford Consensus reports and recommendations on trauma training in a level I trauma center and of community first responders.

Methods: 100 hospital staff as well as local police and first responders participated in a lecture and culmination exercise for an active shooter scenario. An existing wing of the hospital closed for remodel was set up as a functional hospital floor with rooms, beds, charge nurse stations and administration. A simulated “gunman” with black gunfire started the scenario, which produced 15 trained gunshot “victims.” Basic medical supplies (as well as new recommendations such as the C.A.T tourniquet, HALO Chest seal, Chest decompression, Combat gauze, and QuikClot ACS+ Advanced Clotting sponge) found on all floors and hospital resources were available to participants with the goal of quickly minimizing mortality and morbidity of victims. Ongoing feedback was provided to participants and post-course surveys with a 5-point Likert scale were collected.

Results: Participants (Completed surveys n=79, male= 43%, female 58%, 73% reported 5+ years of medical experience) included attending physicians (11.4%), residents/ students (19%), nurses (35.4%), ancillary staff (25.3%) and non-medical personnel (8.9%). Participants agreed that the exercise improved their knowledge (91.1%), skills (82.2%) and ability to work as a team (83.5%) in an active shooter situation. 88% of participants reported that the activity was engaging and realistic. Almost all course participants (92.4%) agreed that active shooter incidents were becoming more common, that the exercise enhanced their general trauma skills (88.6%) and that the exercise should be part of today’s trauma training. 62% agreed that the hospital was not prepared to handle the situation. The hospital also modified their trauma protocols as a result of the course.

Conclusion: Training both surgical residents and attending trauma surgeons in a simulated mass-casualty shooting incident using a multi-disciplinary approach is an innovative educational method that provides for more comprehensive trauma training. Additionally, the consensus recommendations provided an additional benefit to the community, as the trauma training proved useful for local police and first responders.