Quick Shot Abstracts
1. ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY PERFORATIONS: OUTCOMES IN MANAGEMENT
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BACKGROUND: Endoscopic retrograde cholangiopancreatography (ERCP) is a common procedure performed worldwide. It is generally regarded as a safe procedure with a 4% overall complication risk; however, it carries a small but significant risk of perforation, ranging from 0.1%-1% in the literature. Once thought to require immediate surgical intervention, a select group of patients can be managed successfully without operative intervention. However, there has yet to be a consensus in the current literature on patient factors that can be used as markers for successful non-operative management. Furthermore, there has yet to be any published data at a community-based center. The objective of this study was to evaluate the management of ERCP perforations at a single community hospital.

METHODS: A retrospective review of the medical records of all patients who underwent ERCP from January 1, 2004 through June 30, 2014 was completed. Study variables included indications for ERCP, ERCP procedures, diverticula or altered anatomy (i.e. Billroth, gastric bypass), mode of diagnosis, location of perforation, and clinical presentation at time of known perforation. Outcomes included failure of non-operative management, ICU length of stay (LOS), and death.

RESULTS: Nineteen patients underwent ERCP with documented perforation out of 1486 patients who underwent ERCP (0.9%). All ERCPs were performed by an attending gastroenterologist. Among the patients with an ERCP perforation, 10 were female (53%) and the mean age was 50.1 years. ERCPs were performed for choledocholithiasis (47%), choledocholithiasis with cholangitis (16%), jaundice with peri-pancreatic mass (11%), and other (26%). ERCP procedures included sphincterotomy (32%) or sphincterotomy with stent placement (26%), with or without concurrent balloon sweep (32%). Duodenal diverticula were present in 2 (11%) and altered anatomy was present in 5 (26%). Perforation was diagnosed via the following imaging modalities: ERCP 11%, X-ray (37%), CT (84%), and upper GI (16%). Seventy-nine percent of patients had a surgical consult. Seventeen of the 19 patients were treated non-operatively with 3 (16%) undergoing percutaneous drain placement. One patient failed non-operative treatment requiring surgery. All 3 patients that underwent surgery had laparotomy. All patients with perforation were treated with antibiotics. Peritonitis and sepsis were absent in all patients at time of perforation diagnosis. Three patients required ICU stay with median post-ERCP LOS of 5 days. Two patients had 30 day mortality.

CONCLUSION: Perforations remain a rare, but serious, complication of ERCPs. Non-operative management is highly successful in the carefully chosen patient without signs of sepsis or peritonitis. Early recognition of perforation with initiation of antibiotics is key. Our community-based practice patterns match or exceed those previously published for successful non-operative management of ERCP perforations.
2. LAPAROSCOPIC NISSEN FUNDOPPLICATION USING A LEFT POSTERIOR APPROACH MINIMIZES ESOPHAGEAL INJURY: OUR EXPERIENCE
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BACKGROUND: Laparoscopic Nissen fundoplication (LNF) is now considered by most as the gold standard in surgical treatment of GERD with hiatal hernia. The most feared complication of LNF is esophageal perforation. There are different approaches to create the 360° wrap, improved patient outcomes. We present our experience with modified Laparoscopic Nissen Fundoplication using the Left Posterior (mLNF-LP) approach to strategically minimize the risk of esophageal injury.

METHODS: This retrospective review identified patients who underwent fundoplication from 2012 to 2014. Data assessed were age, sex, body mass index (BMI). Indications for Nissen fundoplication repair were: persistent GERD, hiatal hernia type, Barrett’s esophagus, or recurrent GERD. Intra-operative and post-operative complications were assessed. Data were analyzed using descriptive statistics. Details of the procedure are described.

RESULTS: 171 patients underwent mLNF-LP. The average age was 60±14 (range 17-86) years, males (29%) and the mean BMI was 29.8±6.2 kg/m². Forty-seven percent of patients (80/171) were obese. Indications for fundoplication were: persistent GERD (88%), recurrent GERD (11%), recurrent hiatal hernia (8%), Barrett’s esophagus (4%). Among the 171 patients, 158 patients underwent mLNF-LP and hiatal hernia repair, and 13 patients had mLNF-LP alone. Intra-operatively, there were no esophageal perforations, splenic injuries, inadvertent vagotomies, or other organ injuries. The operation time was 100±20 minutes. Overall 98.5% of patients returned for follow-up (median time to visit 20 days). Postoperatively, 39 patients reported dysphagia. Thirty-one of whom improved by their second visit with only 21% (n=8) patients ultimately requiring endoscopic dilation. The following endpoints and complications were noted during follow-up visit: inability to belch (.6%), gas bloating (2%), diarrhea (11%), early transient recurrent reflux (11%), and epigastric pain (19%). There was no pleural effusion (0%), early satiety (0%) or mortality (0%). Seven percent of patients underwent revision surgery.

CONCLUSION: This mLNF-LP approach which strategically minimizes risk to the esophagus is a safe and effective surgical procedure for select patients presenting with symptomatic GERD and hiatal hernia. Moreover, this modified technique can potentially eliminate the high morbidity and mortality of esophageal injury.
BACKGROUND: Background: The presence of a hiatal hernia (HH) is a very common condition and has been estimated to occur in up to 20% of adults. Previous research regarding the etiology of HH has identified several themes in predisposing risk factors in patients: increased intra-abdominal pressure, esophageal shortening, and abnormalities at the cellular and molecular levels. These elements are also commonly noted as potential risk factors in other abdominal hernias, making the examination of its relationship to other hernia types and tissue abnormalities of importance. The aim of this study is to see if there is evidence to support a common genetic predisposition between hiatal hernia formation and other hernias of the abdominal wall using a national database. Abdominal wall hernias (AWHs) of interest were inguinal (IH), femoral (FH), umbilical (UH), and ventral (VH) hernias.

METHODS: Methods: This study examined records from the University HealthSystem Consortium (UHC), which consists of approximately 300 academic and affiliate institutions. The records of patients older than 18 years from October 2010 to October 2014 were queried. International Classification of Diseases 9th revision (ICD-9) codes were utilized to select for patients presenting with HH, IH, FH, UH, and VH. Patient records were grouped into those with and without HH. Demographic factors of race and gender were compared with Pearson’s χ² test as were prevalence of co-morbidities and co-diagnosed AWHs. Age was analyzed with the T-Test. Analyses were conducted with IBM SPSS v.22.0.0.0 and an α-level of 0.05.

RESULTS: Results: A total of 16,175,506 records were used in this study. HH patients consisted of 292,188 records while all other non-HH patients totaled 15,883,318 records. Patients with HH were significantly older than those without HH (65.8 years ± 16.4 vs 54.5 years ± 19.6, p<0.001). All AWHs were significantly more common in patients with HH compared to non-HH patients (IH: 0.58% vs 0.28%; FH: 0.03% vs 0.01%; UH: 0.86% vs 0.41%; VH: 1.38% vs 0.82%; each p<0.001). Comorbidities of obesity, rheumatism/collagen disorders, hypertension, diabetes, chronic pulmonary disease, renal failure, and congestive heart failure, were all significantly more prevalent in patients with HH compared to those without (all p<0.001).

CONCLUSION: Conclusion: AWHs were significantly related to the presence of HH, in each case approximately twice as frequently in HH patients compared to the general patient population. Likewise, the rheumatism and collagen disorders were nearly twice as common in HH patients. Since patient UHC records are not longitudinal, the lifetime prevalence of an AWH and HH in the same individual is likely higher. Management strategies can be refined based on genetic risk factors present at time of diagnosis to determine at risk populations.
BACKGROUND: Incisional hernia repair is one of the most common general surgery operations being performed today. With the advancement of laparoscopy since the 1990s, we have seen vast improvements in faster return to normal activity, shorter hospital stays and less post-operative narcotic use to name a few.

METHODS: Data for this study were obtained from the Truven Health Analytics MarketScan® Commercial Claims and Encounters Database. This Commercial database contains the enrollment and health care (medical and drug) claims of multi-million employees and their dependents that are covered annually under a variety of health plans offered by medium-sized or large firms. Specifically, this commercial database includes inpatient, outpatient, emergency room and outpatient prescription drug claims, linked by a unique patient identifier. The three years (2009-2011) of the Commercial database contains de-identified claims data for approximately 70 million enrollees from more than 300 self-insured employers, 25 health plans and 350 unique carriers in the United States.

RESULTS: At total of 3012 patients were included in the analysis. 84.9% (n=2557) of patients underwent IVH repair and 15.1% (455) were observed and did not undergo IVH repair. Significant results in the surgery group showed a lower mean 90 day post-index cost at $21,180 vs. $24,215.46 and a shorter inpatient over all stay at 3.98 days vs. 4.58 days and estimated days off of 13.98 days vs 15.64 days as compared to the no surgery group. At 365 days, there was a significant decrease in total payments in the surgery group, $29,797.41 vs. $32,373.53 and inpatient length of stay at 4.76 days vs. 5.69 days as compared to the no surgery group. Of the patient that underwent IVH surgery, 24.5% (n=626) were done utilizing minimally invasive surgical (MIS) techniques and 75.5% (n=1931) were done open. There was a significant reduction 90 days post-surgery in the MIS group as compared to the open group in total payment ($19,171.00 vs. $21,745.6), inpatient length of stay (3.11 days vs. 4.24 days), number of outpatient visit (8.19 vs 10.18) and estimated days off (11.41 vs. 14.51), respectively. At 365 days post-surgery, there was a significant reduction in the MIS group vs. open in total payment ($27,398.72 vs $30,177), inpatient length of stay (3.70 days vs. 5.04 days), outpatient visits (23.13 vs 26.72) and estimated days off (35.40 vs. 41.11), respectively. Surgical repair of IVH is cost effective as compared to observation at 90 days and 1 year.

CONCLUSION: Surgical repair of incisional/ventral hernia is cost effective when compared to observation at 90 days and 1 year. When surgical repair of incisional/ventral hernia is done, there is a clear advantage with the MIS approach versus Open in regards to cost, length of stay, number of outpatient and emergency room visits and days off work.
5. RISK FACTORS FOR CONVERSION TO AN OPEN CHOLECYSTECTOMY
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BACKGROUND: Laparoscopic cholecystectomy (LC) is one of the most commonly performed operations in the United States. Conversion to open cholecystectomy (OC) is occasionally needed but can be unduly delayed in an attempt to continue laparoscopically. The objective of this study was to identify predictors for conversion to an OC.

METHODS: We performed a 30-month retrospective analysis of consecutive adult patients who underwent a LC at our university-affiliated county hospital. Variables analyzed were demographics, symptom duration, laboratory values, ultrasound (US) findings, Tokyo and American Society of Anesthesiologists (ASA) grade. Outcomes of interest included surgery duration, complications, final pathologic diagnosis, and length of stay. Multivariable logistic regression analysis was performed to identify independent predictors for conversion to OC.

RESULTS: Of 1,203 patients identified, 77 patients (6.4%) underwent conversion to an OC. Univariate analysis revealed no significant difference in age, gender, body mass index (BMI), or symptom duration between groups. Patients converted to an OC demonstrated a higher ASA score (p<0.0001), elevated wall thickness on US (4.6mm vs 3.3mm, p=0.02), and were more likely to have gangrenous cholecystitis (37.7% vs 10.0%, p<0.0001). Patients undergoing conversion experienced a greater number of complications (p<0.0001) and length of stay (8 vs. 5 days, p<0.0001). On multivariate analysis, after controlling for age, gender, BMI, Tokyo grade, gallbladder wall thickness, ASA status, and gangrenous cholecystitis, independent predictors for open cholecystectomy included ASA status (Odds Ratio [OR] 1.6, 95% Confidence Interval [CI] 1.1-2.4, p=0.03), gallbladder wall thickness (OR 1.2, CI 1.1-1.4, p<0.0001), and gangrenous cholecystitis (OR 3.3, CI 1.8-5.8, p<0.0001).

CONCLUSION: Identification of predictors for conversion to OC is important for pre-operative planning, and may prompt earlier conversion in high risk patients. Understanding these risks can potentially improve overall operative time and reduce complications from difficult laparoscopic circumstances.
BACKGROUND: Morbid obesity is a major risk factor for type 2 diabetes mellitus (T2DM). Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG) have both been shown to improve glycemic control and in many cases lead to remission of T2DM. Multiple studies show a higher long-term remission rate with RYGB compared to sleeve gastrectomy. The effect of RYGB on stimulating hormones such as GLP-1 has been identified in improving long-term T2DM control. Many patients with T2DM are discharged from the hospital following bariatric surgery with no or significantly decreased T2DM medications, before any weight loss is seen. Some believe that early glycemic control is mediated via bypassing the duodenum as is seen in RYGB. Others contend that postoperative dietary changes are the major contributor to early glycemic control. We attempted to address this question by comparing in-hospital postoperative glycemic control in patients with T2DM who underwent RYGB or SG.

METHODS: After obtaining IRB approval, a retrospective review of our institution’s prospective bariatric surgery registry was completed to identify patients with T2DM who underwent laparoscopic RYGB or laparoscopic SG. We introduced SG as a surgical option in early 2010; therefore our study period ranges from February 2010 through September 2014. Postoperative blood glucose monitoring on the first 2 postoperative days and discharge medications for T2DM were compared between the RYGB and SG patients.

RESULTS: During the study period, 484 patients underwent RYGB and 161 patients underwent SG. Of those, 186 patients had T2DM: 165 in the RYGB and 21 in the LSG group, respectively. Preoperative hemoglobin A1c values were similar for the RYGB group and SG groups, (7.3% vs. 7.0%; P=0.283) respectively. The mean glucose values for the RYGB and SG groups were 161.1 vs. 157.1 mg/dL on postoperative day 1 (P=0.636), and 157.5 vs. 154.3 mg/dL on postoperative day 2 (P=0.293), respectively. On admission, 151 (91%) patients in the RYGB and 17 (81%) patients in the SG group were on either oral hypoglycemic medications or insulin. Upon hospital discharge, 127 (84%) patients in the RYGB group and 16 (95%) patients in the SG group were able to discontinue all hypoglycemic medications (P=0.318). For those that remained on medications for T2DM, all were discharged on a decreased number of medications.

CONCLUSION: SG patients experience similar glycemic control immediately following surgery compared to RYGB patients, and both patient populations have a similar reduction in oral hypoglycemic medications and insulin requirements. The effect of bypassing the duodenum as is seen with RYGB may play a role in longer-term T2DM remission, but appears to not have a major contribution in glycemic control immediately after surgery. Dietary factors, or potentially an unrecognized metabolic component, appear to have a significant influence on early glycemic control.
7. A RETROSPECTIVE CHART REVIEW COMPARING TRANSABDOMINAL VERSUS TRANSORAL REMNANT EXTRACTION IN LAPAROSCOPIC SLEEVE GASTRECTOMY
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BACKGROUND: As the incidence of morbid obesity continues to rise worldwide, laparoscopic sleeve gastrectomy (LSG) is becoming an increasingly popular definitive bariatric operation owing to the ongoing research supporting its safety, efficacy and long-term benefits. The technical aspects of this operation continue to evolve in hopes of minimizing perioperative complications. Natural orifice translumenal endoscopic surgery (NOTES) and natural orifice specimen extraction have become areas of focus in hopes of reducing the morbidity associated with open and laparoscopic abdominal operations. This study compares postoperative complications between traditional transabdominal remnant extraction (TARE) and transoral remnant extraction (TORE) in patients undergoing LSG.

METHODS: A retrospective chart review was conducted on 145 patients who underwent LSG from June 2012 through August 2013 with either TARE or TORE. All patients undergoing LSG during this time period were included in the study. Analyzed data included age, sex, preoperative body mass index (BMI), diabetes mellitus (DM) status, surgical site infection (SSI), and postoperative pain control, as assessed by narcotic prescription refill. The operation was conducted in an identical fashion by a single surgeon excluding the extraction of the specimen.

RESULTS: For the TARE and TORE procedures, respectively, patients presented a mean age of 51.4 years (sd=13.31) and 50.89 years (sd = 12.81); and a mean BMI of 42.8 kg/m2 (sd = 7.1) and 42 kg/m2 (sd = 6.0). Baseline differences across procedures were not statistically significant for age (p = 0.8249), BMI (p = 0.8639) or gender (p = 0.2228). The overall difference in post-operative prescription refills between TARE (32.9%) and TORE (16.7%) was statistically significant (p = 0.03382). The common odds of refill were higher in the TARE than TORE patients when controlling for age (odds ratio [OR] = 2.413, p = 0.03438), for BMI (OR = 2.454, p = 0.03391) and for presence of diabetes (OR = 2.011, p = 0.1076). The female odds of TARE refill to TORE refill were OR = 2.454 (p = .03391) and for males this value was OR = 0.2000 (p = 0.3024).There were 3 (4.0%) surgical site infections (SSI) in the TARE patients and 1 (1.4%) SSI in the TORE patients (OR = 3.0, p = 0.6200).

CONCLUSION: This study reports a comparison of TORE versus conventional LSG in the largest group of patients to date. Outcomes of this study support the feasibility and efficacy of TORE and suggest superiority compared to traditional LSG with regard to postoperative pain management. More post-operative pain prescription refills occurred under the TARE than TORE procedure , which was statistically significant. Overall, a near fifty percent decline in post-operative pain medication refills was observed for TORE relative to TARE. Although SSI rates were not significantly greater in TARE when compared to TORE, the OR suggests a potential future area of study with a greater population.
8. DOES AN IN-HOUSE TRAUMA ATTENDING REALLY MAKE A DIFFERENCE
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BACKGROUND: Background: Differences in patient outcomes between trauma systems using on-call versus in-house attending coverage are well explored, but remain controversial with variable results in prior studies. The purpose of this study was to validate patient outcomes for institutional models using in-house versus on-call trauma attending coverage.

METHODS: Method: A 10-year retrospective review was conducted at two trauma centers one mile apart. Center I provides trauma coverage through 24-hour in-house trauma surgeons with mid-level support. Center II provides 24-hour in-house senior surgery resident coverage with an on-call trauma surgeon no more than 15 minutes away. All adult trauma activations resulting from any injury mechanism between 2003 and 2013 were identified. Data collected included demographics, mechanism and injury data, work-up, treatment, hospital and ICU length of stay, ventilator days, mortality, and complications. All comparisons were by univariate analysis.

RESULTS: Results: Patients from Center I (in-house, n=12,151) were more severely injured (ISS=10.5 vs 9.1, P<.001), had lower GCS scores (13.6 vs 13.8, P=.031), and had more patients with a GCS ≤8 (10.4 vs 8.5%, P<.001) as compared to those from Center II (on-call, n=18,904). There was no difference between Centers with regards to proportion with penetrating injury (overall 6.8%) or in shock as defined by a systolic blood pressure <90 mmHg (overall 2.8%). Patients at Center II, more often underwent CT evaluation (65.9 vs 54.3%, P<.001). Intensive care unit admission was more common at Center I (39.3 vs 36.0%, P<.001), but ICU length of stay was longer in Center II (4.0 vs 3.8 days, P<.001). Mechanical ventilation was also more common at Center I (14.8 vs 11.9%, P<.001), but no difference existed in ventilator days between Centers. Hospital length of stay was significantly longer in Center I (4.4 vs 3.9 days, P<.001). Overall mortality was not different between Center I and II (5.1 vs 5.0%, P=0.664). Mortality at Center II (on-call) was higher in those patients presenting with GCS ≤8 (40.4 vs 32.6%, P<0.001) or in shock (55.2% vs 31.0%, P<.001). There were 34 patients (0.3%) at Center I and 190 (0.1%) at Center II who presented in full arrest. After excluding these patients, more patients presented in shock at Center I (2.5 vs 1.8%, P<.001), but mortality was then similar in Centers I and II (24.4 vs 30.5%, P=.083). Similarly, after excluding patients in full arrest, mortality of patients with GCS≤8 was also similar between Centers I and II (30.9 vs 32.9%, P=.283).

CONCLUSION: Conclusion: Although there was no difference in overall mortality between centers, mortality was improved in the in-house attending model in patients presenting in shock and this remained a positive trend after excluding patients who presented in full arrest. Further studies are needed to determine if mortality improvement is due to the attending presence, and if so how management is improved, especially in the shock population.
BACKGROUND: Damage control laparotomy (DCL) is often performed as a temporizing measure for physiologically deranged patients. Recent studies suggest a significant overutilization of DCL, which may be associated with a multitude of potentially iatrogenic complications. Among trauma patients with truncal hemorrhage requiring laparotomy, we aimed to determine the independent effect of DCL on morbidity and mortality.

METHODS: We conducted an IRB approved retrospective cohort study of all trauma patients admitted from 01/2011-12/2013 who (1) underwent an emergent laparotomy (arrival to the operating room [OR] ≤ 90 minutes) for suspected intra-abdominal hemorrhage, (2) received preoperative blood products, and (3) were > 15 years of age. The group was then divided into definitive laparotomy (DEF) and DCL. Following univariate analysis, a comprehensive propensity score was generated for each patient to account for the probability of DCL. After matching, a logistic regression model estimated the treatment effect of DCL.

RESULTS: Of 13,656 trauma patients admitted, 625 underwent emergent laparotomy (39% DCL rate). 237 received preoperative blood products and were the study group: 78 (33%) in DEF group, 144 (61%) in the DCL group, and 15 (6%) who died in the OR. While there were no differences in demographics, the DCL group had a lower ED systolic blood pressure (median 86 mmHg, IQR 70, 108 vs 100 mmHg, IQR 82, 112; p=0.001), lower base excess (median -7 mmol/L, IQR -10, -4 vs -3, IQR -7, -1; p<0.001), higher ED transfusion requirement (median RBC 2 units, IQR 1, 4 vs 2, IQR 1, 2; p=0.006), and higher Injury Severity Score (median 34, IQR 24, 41 vs 19, IQR 13, 35; p<0.001). Time to OR was shorter in the DCL group (median 31 minutes, IQR 20, 45 vs 35 minutes, IQR 21, 65; p=0.05). At completion of laparotomy, final OR SBP, OR pH, and OR BE were not different. The DCL group was more likely to have undergone enteric resection (31% vs 17%, p=0.024), hepatorrhaphy (41% vs 26%, p=0.029), and thoracotomy/sternotomy (16% vs 5%, p=0.018). Following propensity score matching, DCL was independently associated with an 18% increase in hospital mortality, a 7% increase in ileus, a 7% increase in suture line failure, an 11% increase in fascial dehiscence, and a 19% increase in superficial surgical site infection.

CONCLUSION: In severely injured trauma patients, utilization of DCL depends upon the judgment of the operating surgeon. However, the overuse of DCL appears to unnecessarily expose patients to an increased risk of morbidity and mortality.
BACKGROUND: The role of computed tomography (CT) scan of the chest for management of patients with thoracic injuries remains debatable. The aim of this study was to determine the association between CT scan of the chest and need for intervention and outcomes in trauma patients.

METHODS: This is a 2 year (2011-2012) retrospective review of the National Trauma Database (NTDB) including all patients with an initial chest X-ray and a thoracic abbreviated injury severity scale (T-AIS) score of ≥3. Patients were divided into two groups: patients managed with only chest X-ray (No-CT) and patients that received a CT scan of chest after initial X-ray (CT). Presence of hemothorax, pneumothorax, or rib fractures was recorded using diagnosis codes. Intervention was defined as placement of thoracic catheter or thoracoscopy. Outcome measures were: need for intervention, and mortality. Association between CT scan of the chest and outcomes was assessed using multivariate regression analysis.

RESULTS: A total of 19,987 patients with initial X-ray were included of which, 54.4 % (n=10,877) had a chest CT scan after the initial X-ray. There was no difference in age (p=0.31), t-AIS score (p=0.18), penetrating injury (p=0.12), and systolic blood pressure on admission (p=0.24) between the two groups. After controlling for all confounding factors, use of chest CT scan was not independently associated with need for an intervention. However; use of chest CT scan was significantly associated with reduction in mortality by 20% (OR [95%CI]: 1.19 [1.06-1.34], p=0.031).

CONCLUSION: The use of chest CT scan is associated with reduction in mortality rate in trauma patients with thoracic injuries independent of severity and type of injury. The results of this study may help better define the utility of chest CT scan in patients with isolated thoracic injury.
BACKGROUND: Trauma is associated with significant morbidity and mortality in patients with liver cirrhosis. There is a paucity of data determining how cirrhosis affects outcomes following traumatic brain injury (TBI). We hypothesize that cirrhosis adversely affects mortality and increases complications following TBI.

METHODS: Patients with isolated TBI were identified at our academic, Level 1 trauma center between 2000 and 2013. Patients with cirrhosis were matched with non-cirrhotic TBI patients in a 3:1 ratio based on age, gender, injury mechanism, and injury severity score. Demographic data, admission GCS, head injury severity and diagnosis, transfusion of blood products, operative intervention, and outcome measures were collected.

RESULTS: During the 13-year study period, 30,132 patients were admitted to the trauma center. Of those, 8,748 had isolated TBI and 124 patients had isolated TBI and liver cirrhosis. Patients with cirrhosis had increased mortality compared to matched controls (16% vs. 9%, p=0.03) and were less likely to be taken to the operating room for craniotomy (6% vs. 13%, p<0.05). There was no difference in distribution of admission GCS or in the type of intracranial hemorrhage between groups. Patients with cirrhosis were more likely to receive a transfusion of plasma (29% vs. 8%), platelets (20% vs. 4%), and packed red blood cells (10% vs. 5%). There was also no difference in length of stay, infectious, cardiovascular, or thromboembolic complications between groups.

CONCLUSION: Liver cirrhosis is associated with increased mortality in patients admitted with isolated TBI. Cirrhotic patients were less likely to undergo operative intervention for intracranial hemorrhage, perhaps as a result of coagulopathy related to their liver disease. New treatment paradigms may be needed to improve outcomes for cirrhotic patients suffering TBI.
BACKGROUND: Delayed pleural effusion (DPF) is a well-documented complication of rib fractures, however, the consequences of DPF in the elderly has not been discussed in current literature, and many DPF are not treated unless symptomatic. We sought to investigate the characteristics of rib fracture DPF, its associated outcomes, and implications for management in these geriatric trauma patients.

METHODS: A retrospective study was conducted from January 2012 – May 2014 on patients with rib fractures at a single Level-1 Trauma Center. Development of DPF was based on X-ray studies. Predictive variables were: demographics, mechanism of injury, trauma factors, rib fracture severity, and lab values. Patient outcome variables were: hospital length of stay (HLOS), ICU length of stay (ICULOS), and discharge disposition. Student’s t-test, chi-square test, logistic regression analysis were used for data analysis. p<0.05 was considered statistically significant.

RESULTS: 373 patients were identified, 89.5% were white, 54.2% were male, and the average age was 73.6 ± 0.48 years. 54.4% of patients were involved in motor vehicle collisions. An average of 4.8 ± 0.2 ribs were broken. Average ISS and TRISS were 13.9 ± 0.49 and 0.91 ±0.01 respectively. 40.8% of patients had DPF. Independent predictors for DPF were severe rib fractures (high fracture numbers, flail chest, left sided fractures, bilaterality), trauma factors (motor vehicle collision (MVC), high ISS, chest tube placement, hemothorax, pneumothorax, pulmonary contusion), and abnormal admission lab values (WBC ≥11.3, glucose ≥142, albumin <3.5). Multivariate logistic regression derived the equation: Logit(p) = -1.307 + 0.962(MVC) + 0.831(Chest tube placement) + 0.926(pulmonary contusion) + 0.620(rib frx ≥ 6) – 0.828(Albumin≥3.5). Patients with DPF had significantly longer HLOS (9.1± 0.44 vs. 5.6 ± 0.39), and were more likely to go to rehab/skilled nursing facility (rehab/SNF) (OR = 2.938, p < 0.001).

CONCLUSION: The prevalence of DPF is high in geriatric trauma patients who were injured in MVC, have ≥6 rib fractures, pulmonary contusion, chest tubes placement, and albumin <3.5. These patients have significantly longer HLOS and are 3 times more likely to be discharged to rehab/SNF. We recommend more aggressive treatment in these geriatric trauma patients in effort to improve their outcomes.
14. HOW HAS OIL DRILLING ACTIVITY AFFECTED TRAUMA IN NORTHWESTERN NORTH DAKOTA

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BACKGROUND: New oil extraction technology, known as “Fracking”, as well as high oil prices have made oil drilling in deep shale formations in northwestern North Dakota economically feasible. Oil production in the state rose from 30.8 to 243 million barrels from 2002 to 2012. Similarly, the active drilling rig rose from 10 to 200 from 2002 to 2012. To meet the needs of the industry a large influx of population from out of state has been necessary. The oil producing region of the state is largely a rural area being served by critical access hospitals. The dangerous nature of the oil and gas industry, as well as the influx of population, has strained the infrastructure of the region including trauma providers.

METHODS: Patients were identified from the North Dakota State trauma registry that were admitted to the hospital between 2008 and 2013. Patients with unknown county of injury or injury outside of North Dakota were excluded. Patients with other missing data were excluded from individual sub analysis. Data collected on age, county of injury, injury severity score (ISS), cause of injury, work related accident, time of injury, scene arrival, ED arrival time, transport method and outcome (alive or dead). Patients were assigned to high, moderate, and low oil production area based on the county of injury. Patients were assigned to early or late time periods based on the year of injury. Total elapsed time and transport time were calculated by subtracting the injury time or EMS scene arrival time from the ED arrival time. Severely injured was defined as ISS>15. Chi-square test was used to analyze the differences between groups for categorical variables and Wilcoxon signed-rank tests for continuous variables. All P-values are two-sided and statistical significance was defined as P-value < 0.05.

RESULTS: 17,224 patients met inclusion criteria. In the high oil production area there was an 82% increase in total number of trauma admissions in the early vs. late time period from 1026 to 1867 total admissions (p<0.0001). Motor vehicle crashes (39%) were the most prevalent cause of trauma in the high oil production area and also doubled between the early(339) and late(793) time periods(p<0.0001). Similarly the occurrence of work related accidents, fixed wing and helicopter transports, and severely injured patients increased. Mortality of the severely injured patients increased over the period of the study from 9.2 to 15% in the high oil production area(p<0.0001).

CONCLUSION: The strength of the study is that it is a large data set from the entire state over a long period of time. The limitations are that data may be missing or unreliable, however we are able to see some definite trends. The oil industry has significantly impacted trauma care in northwestern North Dakota not only in terms of numbers but outcomes, especially for the most severely injured. Interventions to improve this include improving workplace and highway safety, as well as access to emergency care and transportation.
15. ARTERIAL REVASCULARIZATION WITH THE RADIAL ARTERY IS SAFE AND EFFECTIVE IN PATIENTS UNDERGOING BYPASS GRAFTING: A CONSECUTIVE SERIES OF 1946 PATIENTS
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BACKGROUND: Arterial revascularization for patients undergoing coronary artery bypass grafting (CABG) has been demonstrated to improve short and long-term outcomes. Despite this, and while utilization of the left internal mammary artery (IMA) during CABG is commonplace, the use of more than one arterial conduit is uncommon in the United States. While recognized as a potential conduit for decades, the radial artery is not widely used due to early reports of vessel spasm and recurrent ischemic events. We hypothesized that current techniques with pedicled endoscopic harvesting reduces trauma and allows for routine, safe, and effective use of the radial artery as a second arterial conduit for CABG.

METHODS: Consecutive patients from a single center undergoing isolated CABG between 2007-2013 were retrospectively reviewed. All patients underwent preoperative arterial Doppler screening to ensure an intact palmar arch and suitable radial artery. All patients with a suitable radial conduit were utilized along with the IMA during CABG. Endoscopic harvesting of the radial artery and intraluminal application of papaverine was used in all cases and the resulting pedicled radial artery used either as a sequential T graft from the IMA or as a free graft off the aorta.

RESULTS: All patients undergoing isolated CABG during 2007-2013 were included in the study (n=1946). 76.7% of patients (n=1493) underwent radial artery grafting and 96.7% (n=1879) underwent IMA grafting. Outcomes included: reoperation for bleeding 2.0% (n=39), deep sternal wound infection 0.3% (n=6), permanent stroke 0.7% (n=15), prolonged intubation 4.4% (n=85), atrial fibrillation 23.6% (n=459), readmission within 30 days 10.5% (204), and 30 day mortality 1.4% (27). Complications from radial artery harvesting were minor (seroma 3%) and no patient developed ischemic complications of the hand. Kaplan-Meyer survival estimates after isolated CABG were 0.95 at 3-years and 0.92 at 5-years. For comparative purposes, from July 2010 to December 2012 the Society of Thoracic Surgery national database statistics show a national radial artery grafting rate of 4.6% in patients undergoing CABG.

CONCLUSION: In this inclusive, consecutive series, the frequency of radial artery utilization was greater than 15 fold the national norm and clinical outcomes in the short and medium term were excellent. We submit that the radial artery may be routinely used during CABG as a second arterial conduit with few complications, low readmission rates, and low rates of 30 day and 5 year term mortality. Routine preoperative arterial ultrasound makes ischemic complications negligible and endoscopic harvesting and intraluminal papaverine allow for routine use while minimizing vasospasm.
16. IMMEDIATE POST-TRAUMATIC PULMONARY EMBOLISM IS NOT ASSOCIATED WITH RIGHT VENTRICULAR DYSFUNCTION
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BACKGROUND: Background: Pulmonary embolic events among trauma patients are associated with a high morbidity and mortality. Computed tomography pulmonary angiography (CTPA) is a preferred imaging modality in these patients due to its ability to detect right heart dysfunction. Interventricular septum position, right ventricle (RV) to left ventricle (LV) diameter ratio, and RV to LV volume ratio have been shown to be predictive of RV dysfunction in the setting of acute pulmonary embolus (PE). However, no studies to date have examined whether these CT findings differ between early versus late PE. We set out to compare the prognostic role of CT signs of RV dysfunction between early versus late PE and to determine whether there is a difference in outcomes between the two groups.

METHODS: Methods: All patients admitted to an urban level I trauma center with a traumatic injury and radiographic evidence of PE via computed tomography during the same hospitalization from 2008 to 2013 were retrospectively identified. The study population was divided into two groups based on the time of diagnosis of the PE [early (< 48 hours from admission) vs. late (≥ 48 hours from admission)]. Patients’ demographic and clinical characteristics were extracted. The primary outcome was PE related mortality. Secondary outcomes included radiographic findings from the CTPA, ICU length of stay and total ventilation days.

RESULTS: Results: During the study period, a total of 50 patients were identified. Of these, a total of 14 patients had an early PE while 36 had a late PE. No significant differences between the baseline characteristics were identified. The mean age was 45 years and 72% were males. Patients sustaining a late PE had a higher PE-related mortality rate. The mean RV diameter was 39 ± 5 mm for early PE versus 44 ± 7 mm for late PE (p<0.05), and the mean RV volume was 20 ± 5 cm2 for early PE versus 26 ± 7 cm2 for late PE (p<0.05). The mean RV/LV diameter was 0.95 ± 0.11 for early PE versus 1.14 ± 0.27 for late PE. The RV/LV volume was 0.88 ± 0.24 and 1.05 ± 0.29 for early versus late PE, respectively. Patients sustaining an early PE had a shorter hospital length of stay and fewer ventilator days compared to their counterparts.

CONCLUSION: Conclusion: Early post-traumatic PE appears to be associated with fewer right ventricular physiologic changes than late post-traumatic PE. Many of the radiologic findings may represent pulmonary thrombosis from direct chest trauma as opposed to underlying embolic phenomenon. It remains to be seen whether early CT findings of pulmonary embolus should be managed according to previously established guidelines for embolic disease.
BACKGROUND: Nonoperative management (NOM) of blunt splenic injuries not infrequently includes angioembolization. Indications for angioembolization include contrast blush within the splenic parenchyma, associated large hemoperitoneum, and or a high-grade splenic injury. Published rates of failure after angioembolization range from 0% to 33% and includes re-bleeding, infection, and infarction. Splenic infarction after angioembolization reportedly occurs in up to 3.8% of embolized patients. We hypothesized that splenic infarction occurs more frequently than previously reported.

METHODS: A retrospective review was performed at an ACS verified Level 1 trauma center from 1/2007-7/2014. All patients undergoing angioembolization for a trauma-related splenic injury were included. Data collected included patient demographics, injury related information, embolization procedure details, and reason for embolization failure, if applicable. Statistical analysis was performed using Mann-Whitney U tests and Chi-square tests. Significance was attributed to a p value < 0.05.

RESULTS: During the study period, there were 19,031 trauma admissions and 847 patients had blunt splenic injury. Angioembolization was performed in 77 patients (9%) with the majority being performed for contrast extravasation on CT scan (49 patients) or large hemoperitoneum seen on CT scan (21 patients). Subsequently, 10 of the 77 patients (13%) were found to have splenic infarction requiring a splenectomy and 7 of the 10 had active extravasation at the time of embolization. 6 of 10 patients failed within 5 days of embolization and an additional 2 patients failed at 10 days. Patients with splenic infarction following embolization were older (53 vs 39, p=0.03), but no differences existed between patients with infarct and patients without infarct in injury severity score, grade of spleen injury, embolization material, or location of embolization.

CONCLUSION: Splenic embolization is a safe and effective part of the armamentarium in NOM for a majority of blunt splenic injuries. However, the incidence of splenic infarction is more common than previously reported (13%) and vigilance for this complication, especially in older patients, is required.
18. TRENDS IN THE MANAGEMENT OF MAJOR ABDOMINAL VASCULAR INJURIES: 2000-2014
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DS Plurad MD

BACKGROUND: Abdominal vascular injuries are highly lethal. Damage control surgery (DCS) and hemostatic resuscitation
have improved outcomes among trauma patients. The objectives of this study were to examine our institutional
experience with abdominal vascular injuries, to identify risk factors for mortality, and to characterize the evolution of
management over time.

METHODS: We performed a 15-year retrospective analysis of our level-1 trauma center database to identify patients with
major abdominal vascular injuries. The primary outcome measure was mortality. Bivariate analysis identified significant
differences between survivors and non-survivors. Multivariate and trend analyses were performed to identify predictors
of mortality and changes in the use of DCS (shunting/ligation) and resuscitative practices over time.

RESULTS: A total of 566 abdominal vascular injuries were identified in 364 patients. The majority were male (70.0%) with
a mean age of 33 (± 15 years). Penetrating mechanisms accounted for 62% of all injuries and the mean Injury Severity
Score (ISS) was 32 (± 18). The overall mortality was 49% (n=179). Patients who died were more likely to present with
hypotension (78% vs. 22%, p<0.0001), undergo resuscitative thoracotomy (30% vs. 3%, p<0.0001), and had a higher
incidence of concomitant arterial and venous injuries (22 vs. 9%, p=0.02). Non-survivors were more likely to undergo a
massive transfusion (34% vs. 15%, p<0.0001). There was no significant difference in the use of DCS techniques between
groups. Increasing American Association for the Surgery of Trauma-Abdominal Vascular Injury Scale grade was associated
with an increased risk for mortality: grade I, 30%; grade II, 18%; grade III, 45%; grade IV, 56%; grade V, 72% (OR 2.21,
95% CI 1.03-4.76; p=0.043). Independent predictors of mortality on adjusted analysis included both an increased
intraoperative base deficit and estimated blood loss (both p<0.005). Over the 15-year study period, there was a non-
significant decreased trend in mean crystalloid volume administration (3% change annually, p=0.07) and increased use of
shunting/ligation (mean 20% change annually, p=0.09). Since the introduction of an institutional massive transfusion
protocol in July 2009, there has been a significant decrease in the mean packed red blood cells to fresh frozen plasma ratio
(7% change annually, p<0.0001). However, mortality due to major abdominal vascular injuries has remained relatively
unchanged over time.

CONCLUSION: Despite increased use of damage control surgery and modern resuscitative practices, mortality from
abdominal vascular injuries continues to remain high. Injury severity, increased blood loss and base deficit are predictive
for mortality. Prospective, multi-center studies may provide further insight into the optimal surgical and resuscitative
practices associated with survival in patients with these lethal injuries.
BACKGROUND: Blunt cardiac injury (BCI) is an infrequent but potentially fatal finding in thoracic trauma. Its clinical presentation is highly variable and patient characteristics and injury pattern have never been described in trauma patients. The aim of this study was to identify predictors of mortality in BCI patients.

METHODS: We performed a 4-year retrospective analysis of all trauma patients diagnosed with BCI at our level 1 trauma center. Patients older than 18 years, blunt chest trauma, and diagnosis of BCI were included. BCI was diagnosed based on presence of electrocardiography, echocardiography, biochemical cardiac markers and/or radionuclide imaging studies. Elevated troponin I was defined as more than two recordings of ≥ 0.2. Abnormal EKG findings were defined as presence of bundle branch block, ST segment, and t-wave abnormalities. Univariate and multivariate regression analyses were performed.

RESULTS: A total of 117 patients with BCI were identified. The mean age was 51±42 years, 66% were male, mean SBP was 96.4 ± 25.7, and overall mortality rate was 43%. Patients who died were more likely to have a lactate > 2.5 (68.8% vs. 39.6%; p=0.02), hypotension (SBP < 90) (86% vs. 18.9%; p=0.001), and elevated troponin I (65.7% vs. 10.6%; p=0.01). There was no difference in the rib fracture (38.3% vs. 37%; p=0.9), sternal fracture (40.2% vs. 26.3%; p=0.3) and abnormal EKG (40.7% vs. 34%; p=0.5) findings. Hypotension and Lactate > 2.5 were the strongest predictors of mortality in BCI. (Table)

CONCLUSION: Blunt cardiac injury remains an important diagnostic and management challenge. However once diagnosed resuscitative therapy focused on correction of hypotension and lactate may prove beneficial. Although role of troponin in diagnosing BCI remains controversial, elevated troponin may have prognostic significance.
20. FACTORS AFFECTING MORTALITY AFTER PENETRATING CARDIAC INJURIES: 10 YEAR EXPERIENCE AT URBAN LEVEL I TRAUMA CENTER
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BACKGROUND: While penetrating cardiac injuries (PCIs) are associated with a high mortality, patients that survive to reach the hospital can provide a significant challenge for trauma surgeons. The objective of this study is to assess factors which affect mortality after PCIs to assist in practical surgical decision making.

METHODS: Patients with PCIs were identified from a trauma registry from January 2003 to December 2012. Patients who arrived without recent signs of life were excluded. Prehospital, injury complex and clinical patient factors were analyzed by odds ratio to determine their effect on mortality.

RESULTS: Over the 10 year study period, 80 PCI patients survived to reach the hospital. The majority of these patients were critically injured young males who had sustained gunshot wounds (GSWs) [males = 72/80 (90%), median age = 29 years, GSW = 49/80 (61%), median base deficit (BD) = -12]. In terms of injury complex, 27 patients (34%) had multi-chamber injuries, 44 (55%) patients presented with cardiac tamponade and 30 (38%) presented with left side massive hemothorax. Emergency department (ED) thoracotomy was performed in 21 (26%) patients. Of the 21 factors analyzed, prehospital CPR [OR = 30, 95% CI(3.4,253)], scene time > 10 minutes [OR = 58, 95% CI(5.9,573)], undergoing ED thoracotomy [OR = 19, 95% CI(4.7,79)] and massive left hemothorax [OR = 15, 95% CI(4.7,45)] had the most impact on mortality for PCI patients. Cardiac tamponade physiology appeared to be protective with an OR = .08 [95% CI(0.03,0.23)].

CONCLUSION: Factors which demonstrate the lethal nature of PCIs such as need for prehospital CPR or ED thoracotomy were associated with significantly higher risk of mortality. However some modifiable factors such as EMS scene time were also associated with higher mortality. Interestingly, patients with cardiac tamponade demonstrated a lower risk of mortality indicating early operation for these patients may improve survival after PCI.
BACKGROUND: With the development of new endovascular techniques there is a focus on the use of aggressive measures, including Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) and emergency department resuscitative thoracotomy (ED-RT), for patients presenting in extremis after penetrating torso injury. Choosing which patients may benefit from using these aggressive measures is difficult. The recently published Western Trauma Association Algorithm for ED-RT suggest systolic blood pressure (SBP) is the key indicator for patients who might benefit from ED-RT. But, intense pre-hospital resuscitative efforts can alter SBP and mask true injury severity. As a result, exploring other indicators of the physiologic reserve, such as cardiac rhythm, may aid in determining potential survivability after penetrating torso trauma. We hypothesized for patients presenting in Class III and IV shock after penetrating torso injury that cardiac rhythm would be associated with survivors of aggressive resuscitative measures.

METHODS: All patients admitted to an urban Level I trauma center from 06/2010-04/2014 with penetrating injury from the mandible to iliac crest circumferentially with an initial SBP ≤90 and signs of life were followed prospectively. At presentation, a rhythm strip (RS) was obtained. RS were evaluated by a cardiologist blinded to patient outcome and injury status. Bivariate analyses were used to determine the association of presenting rhythm (Atrial vs Ventricular) with survival.

RESULTS: 71 patients met inclusion criteria. Of those, 25 (35%) had ED-RT, operating room thoracotomies or sternotomies. Patients with atrial rhythms were much more likely to survive compared to patients with ventricular rhythms (70.2% v 7.7%, OR 28.23 p<0.001) no matter the class of shock. Among those with thoracic surgical intervention similar trends were observed, but did not reach statistical significance (31.6% v 0.0%, p < 0.114). Of patients who had ED-RT (n=15), 14 died prior to discharge. The lone survivor presented with an atrial rhythm. There was no relationship with survival based on location of injury.

CONCLUSION: Cardiac rhythm on arrival predicts survivability of penetrating torso trauma. Patients that present in a ventricular rhythm carry a significantly worse prognosis. Strong consideration should be given to withholding aggressive measures, including ED-RT and REBOA, in patients who present in profound shock and with a ventricular rhythm and algorithms should be altered to include presenting rhythm as a key indicator in addition to SBP.
BACKGROUND: Distracted driving, most notably texting and driving, has been a focus of many injury prevention efforts in the state of Texas since 2010. We wanted to see the effect “No Texting” programs had on distracted driving crashes and deaths.

METHODS: We accessed the Texas Department of Transportation Crash Data system. We collected crash reports from 2003 through 2013 and assessed both crashes and fatalities by Contributing Factor, focusing specifically on the three areas officers use to record known or even potential texting and driving events: Distraction in Vehicle, Driver Inattention, and Mobile/Cell Phone use. These were collectively termed “Distracted Driving.” We also accessed the system for all crashes and deaths related to alcohol, total crash deaths, and miles driven by year. The significance of variation in rates with year was assessed with a linear Poisson model with a long link and offset of miles in log units. All statistical testing was 2-sided with a significance level of 5%.

RESULTS: From 2003 through 2013 crashes involving Driver Inattention fell from 104,548 to 86,628 (p<0.001), Distraction in Vehicle rose from 9,899 to 10,890 (p=0.93), and Mobile Phone use fell from 4,364 to 3,430 (p<0.001). Total miles driven in the state rose from 222.7 to 246.7 Billion Miles Driven (Bmd). Total Crash Deaths fell from 17.2/Bmd to 13.7/Bmd (p<0.001). Distracted Driving crashes fell from 533.4/Bmd to 409.2/Bmd from 2003 to 2013 (p<0.001), deaths fell from 607 (2.73/Bmd) to 462 (1.87/Bmd) (p<0.001). Over the same time frame, Alcohol related crashes fell from 15,676 (70.4/Bmd) to 14,967 (60.7/Bmd) (p<0.001), Alcohol related deaths rose from 486 (2.18/Bmd) to 594 (2.41/Bmd) (p<0.001). From 2010 to 2013 Distracted Driving Crashes increased from 389.5/Bmd to 409.2/Bmd (p<0.001). Distracted Driving Deaths did not change significantly from 2010 to 2013, 1.90/Bmd to 1.87/Bmd (p=0.98).

CONCLUSION: The effort to stem distracted driving deaths and crashes through the current injury prevention model in Texas did not seem to help. Moreover, texting, despite its exponential increase nationally since 2007, did not seem to affect the total numbers of Distracted Driving crashes or deaths in Texas. Texting still represents a significant distraction to drivers. But our data suggests something else, other than texting alone, is the major contributor to Distracted Driving crashes and deaths in our State. Texas needs to focus its efforts to better identify the cause of these crashes. Only then can we hope to really improve injury and death prevention from Distracted Driving.
BACKGROUND: Severe metabolic aberration is a hallmark of major traumatic injury contributing to patient morbidity and mortality. While the metabolic response to trauma has been a long-standing focus of investigation, the complex biochemistry and subcellular metabolism responsible remain largely unknown.

METHODS: Trauma and hemorrhagic shock (T/HS) was induced in Sprague Dawley rats by controlled hemorrhage and resuscitation was performed with normal saline and half shed blood. Plasma samples were sequentially collected for metabolomic analysis by Ultra High Pressure Liquid Chromatography – tandem Quadrupole Orbitrap high resolution mass spectrometry. Student T-test was employed to determine significance of fold change comparisons from pre- and 1hr post-shock samples between T/HS and sham shock animals.

RESULTS: Immediately following T/HS we identified purine catabolism (consumption of basic compounds inosine and hypoxanthine) compared with sham shock, p<0.05. These purine precursors are known to fuel energy production via the Tricarboxylic Acid (TCA) cycle as an alternate pathway to glycolysis. Consistent with this we identified a corresponding production of TCA cycle intermediates (2-oxoglutarate, citrate, succinate, fumarate and malate) as well as accumulation of other downstream purine catabolites (polyamines spermine and spermidine) related to the urea cycle.

CONCLUSION: By metabolomic analysis we have identified the subcellular catabolism of purines to fuel the accumulation of TCA cycle intermediates. The consumption of basic purines with resultant accumulation of TCAs provides additional evidence for the proposed role of subcellular metabolites in post-shock acid-base imbalance. The accumulation of spermine and spermidine suggests an immediate nitrogen imbalance at the cellular level following T/HS. These unique metabolic findings provide the foundation for future studies to evaluate metabolic deregulation with patient outcome, acidosis and efficacy of resuscitation strategies at the cellular level.
BACKGROUND: Human factors can improve the efficiency and safety of patient care by optimizing systems to reduce flow disruptions. While simulations are frequently incorporated into team training, a comprehensive, ergonomic evaluation is required to better understand how simulations improve learning. We therefore applied human factor techniques to evaluate the frequency and specific causes of flow disruptions (FD) in a trauma simulation.

METHODS: A 60-minute auto versus pedestrian trauma simulation was conducted with 26 trauma care providers: surgical residents (2), trauma surgeon, emergency medicine physician, pharmacist, social worker, radiology technician, clinical partner, emergency department nurses (5), paramedics (3), OR nurses (3), OR recovery nurses (2), OR triage nurse, surgical technician, anesthesiologist, perfusionist and blood bank technician (2). Three trained observers recorded disruptive events that occurred during the simulation. Each FD was analysed and categorized into one of five root causes. After completion of the simulation, participants completed an 18-question yes/no survey.

RESULTS: A total of 39 FD related to the simulation were categorized as anatomical (14), coordination (7), equipment (10), instructor (3) and participant (5). Anatomical disruptions included mannequins limited by awkward location of the femoral pulse, EKG leads that would not stay in place, and peripheral access that lacked realism. Coordination disruptions included participants guessing operative need by the presence of OR staff during the briefing, vital signs that were out of sync with the simulation and the lack of an OR bed such that the mannequin was not transferred from the gurney. Instructors inadequately discussed available options for the mannequin, excluded important equipment such as endotracheal tube stylet and Mayo stand, and delayed the start of the simulation. Participants frequently avoided opening specific equipment along with procedure trays, rapid infuser, Foley, NG’s and medications. Survey results noted that simulation should be mandatory (69%), simulation was easy to use (73%), comfortable with the setting (92%), talking to the mannequin was difficult (58%).

CONCLUSION: Trauma simulations require a complex relationship among task, team, technology and goals. Thoughtful modifications such as refining mannequin anatomy, improving coordination of simulation plan, reducing equipment defects, and training instructors and participants on expectations will reduce flow disruptions and improve the educational experience.
25. OVERUTILIZATION OF BIOHAZARD RED BAGS
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BACKGROUND: In an era of unsustainable healthcare costs, reductions are necessary in all areas of healthcare. US health care facilities produce 6,600 tons of waste daily. Biohazard waste disposal (BWD) is a significant part of hospital costs, composing 86% of all environmental services cost. The operating rooms (OR) and obstetrics and gynecology (OB/GYN) departments alone compose 70% of all hospital waste. We hypothesized that there is an overuse of biohazard red bags (BRB). The objective of this study was to reduce BWD by means of staff education as to what should and should not be placed in a BRB.

METHODS: Baseline BWD volumes from the OR were measured for one month and subsequently measured in OB/GYN for four months. In-services were then conducted to educate OR and OB/GYN staff as to the current recommendations by the Center for Disease Control and Occupational Safety and Health Administration for BWD and the indications for use of the BRB. Pre and post in-service surveys were conducted. Differences in pre and post in-service survey responses were compared via binomial sign test. For the next year, the amount of BWD from the OR was measured. For the next three months, the BW was weighed from the OB/GYN department.

RESULTS: Pre-inservice surveys demonstrated 35% of OR and 44% of Ob/Gyn staff did not know the proper indications for BWD. Post-inservice surveys demonstrated a statistically significant improvement in knowledge (P=0.0002 for OR and P=0.007 for Ob-Gyn). In the following year, the OR maintained a 21% BWD reduction. The Ob/Gyn department demonstrated a 64% BWD reduction in the three months following the in-services. Combined, this resulted in reduction of 40,000 lbs of BRB.

CONCLUSION: Overuse of the BRB is common. Education alone as to the indications for BRB use can result in cost and environmental savings.
26. IMPROVING OR EFFICIENCY: CONVERSION FROM A FIRST-COME OR SCHEDULING SYSTEM TO A BLOCKED TIME OR SCHEDULING SYSTEM
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BACKGROUND: Changes in health care financing have reduced operation margin and prompted improvements in the efficiency of health care delivery. Operating room (OR) efficiency remains a frequent topic of conversation but the literature to help guide policy remains primarily theoretical and model-driven. No clear consensus exists on the preferred method of scheduling. We present data gathered during a successful transition from the “first-come, first-served” model to an 8-hour block schedule for individual surgeons based upon historical utilization. Goals of the transition included improved OR productivity, reduced OR staff turnover and implementation of protected booking time for individual surgeons.

METHODS: To optimize the transition to block scheduling, historical patterns of utilization were calculated and used to assign quantities of block time. Blocks were assigned as 8 hour days in the OR to individual surgeons based upon average weekly OR time over a 1 year period. Additionally, a separate block assignment was created for urgent cases. Data from two six month spans (prior to and after implementing block scheduling) were collected and compared. Data points included total case volume, operating room utilization, turnaround times, first case on-time starts, same day cancellations and after-hours case numbers.

RESULTS: OR productivity increased evidenced by a 3% increase in case volumes in the context of decreased utilization from 71% to 68% during the two time periods studies. Average turnaround time remained relatively constant at 40 minutes. After block-time implementation, first case on-time starts rose from an average of 83% to 91%. We experienced a 40% reduction in OR staffing agency expenditures as well as a decrease in same day surgery cancellations from 4.8 to 4% with block time scheduling. The total OR hours of late cases after 5 p.m. decreased by 6% with block time scheduling with a decrease in case hours after 11 p.m. of 43%.

CONCLUSION: Studies have shown that optimal utilization (if service workloads were always the same each weekday) would be 68%. Changing to block scheduling optimized our utilization. We increased our case volume while reducing agency costs. Improvement in first case on-time starts converts unproductive down time early in the day to productive end of the day prep time for the next day’s schedule. There are numerous considerations when planning a conversion from a first-come, first-served OR booking system to a block time system. We were able to optimize our OR’s productivity by converting to a block time booking system using mathematical calculations and a relatively simple set of rules. As a result, we were able to improve first case on-time starts, decrease same day surgery cancelations, increase OR case volumes without increasing utilization and decrease dependence on OR staffing agencies. These metrics all indicate improved workflow and OR productivity following a transition to block scheduling.
BACKGROUND: Prehospital focused assessment with sonography in trauma (FAST) can provide early identification of patients with abdominal hemorrhage. The purpose of this study was to investigate potential benefits of prehospital FAST in a large, urban EMS system on the following three measures: 1) time spent in the emergency department (ED) before the operating room 2) appropriate triage by the receiving hospital and 3) appropriate EMS hospital destination determination.

METHODS: All blunt-trauma patients from 2010 – 2012 who went directly to the operating room from the ED, were upgraded to a trauma code, or were received from an outside facility were reviewed. In order to have a better understanding of the percentage of impact on a specific EMS system, only patients from one county were included.

RESULTS: Over the 3-year period, the EMS system transported 2,372 patients with abdominal trauma of which 1,438 went directly to the trauma center. Sixty (4%) of these patients had a positive FAST and required emergent operative intervention after a median ED time of 45 minutes. 112 patients (8%) were upgraded to a trauma code after a positive FAST in the ED. Their median ED length of stay was 135 minutes. 159 patients were transferred to the trauma center from a community hospital with positive FASTs. The median outside ED length of stay prior to transfer was over 3 hours.

CONCLUSION: While prehospital FAST would benefit only a small percentage of patients, the time savings could be significant. Furthermore prehospital FAST as a destination determination criterion could significantly decrease under-triage and time to arrival at a trauma center.
28. PEDIATRIC APPENDICITIS AND NEED FOR ANTIBIOTICS AT TIME OF DISCHARGE: DOES ROUTE OF ADMINISTRATION MATTER?
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BACKGROUND: Approximately one fourth of children with acute appendicitis have complicated appendicitis requiring ongoing antibiotic therapy following hospital discharge. Unfortunately, there are limited data available to guide the surgeon regarding antibiotic selection, specifically in regards to route of administration. Some surgeons prefer IV antibiotics while others prescribe only oral antibiotics. We hypothesized that among children with appendicitis who are discharged home with antibiotic therapy, the post-discharge readmission and complication rates do not differ between those children who receive IV antibiotics and those who receive oral antibiotics.

METHODS: We performed a retrospective review of all children discharged home on antibiotics following appendectomy at a single institution between 11/10 – 4/14. We compared outcomes including ED and hospital readmission rates, and development of postoperative complications, between those children who were discharged on IV antibiotics and those discharged on oral antibiotics. Exclusion criteria included interval appendectomy, negative or incidental findings, significant concomitant illness or ICU admission postoperatively, and open appendectomy in order to eliminate these confounding factors from analysis.

RESULTS: 276 children were discharged with antibiotics following appendectomy during this time period (n=248 oral antibiotics group; n=28 IV group). These groups did not differ in terms of the percentage of children who were male (55% oral vs 54% IV; p=0.9) or the mean age (9.5 oral vs 9.7 years IV; p=0.8). Children in the IV group had a longer initial hospitalization length of stay (LOS) (9.1 vs 5.1 days; p<.0001) and longer course of home antibiotics (9.6 vs 6.1 days; p<.001) compared to the oral group. On univariate analysis, rate of each complication did not differ between the two groups including inpatient readmission (4% oral vs 7% IV; p=0.3, 95% confidence interval 0.4-8.8), ED readmission (8% vs 11%; p=0.7, 95% CI 0.4-4.7), post discharge complications related to the operation (10% vs 15%; p=0.5, 95% CI 0.5-4.9), or abscess development post discharge (4% vs 4%; p=1, 95% CI 0.1-8.1). On multivariate analysis, after controlling for the presence of a postoperative complication prior to hospital discharge, initial hospital LOS, and days of post discharge antibiotic therapy, no differences were seen between the IV and PO groups with regard to inpatient or ED readmission, development of post discharge complications or post discharge abscess.

CONCLUSION: We found that among children with appendicitis who are discharged home with antibiotics, route of administration did not correlate with hospital readmission or postoperative complication rates. Given the known increased cost associated with home IV antibiotic administration, as well as increased risk, lower patient satisfaction and longer return to activity, our data suggest that oral antibiotics are favorable for these children.
29. PATIENT SATISFACTION AFTER OUTPATIENT APPENDECTOMY
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Temple, TX

BACKGROUND: Outpatient laparoscopic appendectomy has shown to be safe, with a low morbidity and readmission rate. Outpatient management decreases the cost of care for uncomplicated appendicitis. It has been questioned whether outpatient appendectomy produces poorer patient satisfaction.

METHODS: Patients with uncomplicated appendicitis were treated as per a previously published protocol from our institution. Patients were counselled preoperatively as to plans for outpatient management and provided a written instruction sheet for postoperative care, follow up appointments, and contact information. Telephone surveys of patients who underwent outpatient laparoscopic appendectomy for uncomplicated appendicitis from January through October 2013 were performed. A Likert scale from very dissatisfied (1) to very satisfied (5) was employed. Patients were also queried that if in retrospect, they were given the opportunity to stay in the hospital, would they have chosen to do so.

RESULTS: Forty-one males and thirty-one females with an average age of 36 years (range 19-79 years) underwent outpatient laparoscopic appendectomy for uncomplicated appendicitis at our institution from January through October 2013. Fifty-four (75%) were reached for telephone satisfaction surveys. Patients were dismissed from the recovery room in keeping with a previously published protocol for outpatient management. Dismissal occurred between 6 a.m.-noon in 24%, noon-6 p.m. in 17%, 6 p.m.-midnight in 22%, and midnight-6 a.m. in 37%. Average satisfaction score for outpatient management was 4.6 (range 2-5). In the subset of patients dismissed between midnight and 6 a.m., patient satisfaction with outpatient therapy averaged 4.7. Six patients (11%) stated they would have preferred hospitalization if given the opportunity. The reasons stated included: inadequate pain control (2 patients), lack of home assistance (2 patients), nausea and vomiting after dismissal (1), and prolonged drowsiness (1 patient). Four of these patients represented violations of the outpatient management guidelines (pain controlled on oral analgesics and adequate home assistance).

CONCLUSION: Outpatient laparoscopic appendectomy can be performed with high patient satisfaction and acceptance. Night time dismissal did not diminish patient satisfaction. Adherence to protocol guidelines for outpatient management is important to properly select patients for outpatient management and maximize patient satisfaction.
30. PREDICTORS OF THE PRESENCE OF STRANGULATED BOWEL IN PATIENTS WITH HERNIAS
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BACKGROUND: Diagnosing intestinal strangulation in the setting of incarcerated hernias remains challenging. Multiple studies have been performed without identification of reliable predictors of ischemic bowel. Hyponatremia has been identified as a predictor of the presence of necrotizing soft tissue infections and gangrenous cholecystitis. We hypothesized that hyponatremia could be used as a predictor of ischemic bowel in the setting of incarcerated hernias containing small bowel.

METHODS: Medical records for 163 patients diagnosed with an acutely incarcered hernia or hernia with symptoms of small bowel obstruction over a five-year period were reviewed. Preoperative clinical, laboratory, and radiologic findings as well as demographic data, and final intraoperative diagnosis were collected for each patient. We then performed univariate followed by multivariate analysis to identify predictors of ischemic bowel.

RESULTS: Fifty percent of patients were male with an average age of 50.2 years. Thirty-six patients (22.1%) had ischemic bowel requiring resection. Multiple variables were noted to be significant on univariate analysis including serum sodium (p= 0.0002), chloride (p=<0.0001), bicarbonate (p=0.04), glucose (p=<0.0002), white blood cell count (WBC) (p=0.002), and skin changes (p=0.001).

In a multivariable model including skin changes and sodium, skin changes were associated with an odds ratio for ischemia of 3.3 (1.3-8.6 p=0.01). Sodium of less than 135 had an odds ratio for having ischemic bowel of 3.9 (1.7-9.1, p=0.01). If a patient had neither skin changes nor was hyponatremic the model had a negative predictive value of 88.7% (80.7-93.7%). This model had an area under the curve of 0.73 and Hosmer Lemeshow fit statistic of p=0.3.

CONCLUSION: We have assessed clinical, radiologic and laboratory predictors of ischemic bowel. Analysis of multiple preoperative criteria demonstrate that skin changes on physical exam and hyponatremia are both associated with the presence of ischemia bowel in the setting of incarcerated hernias. Hyponatremia should raise suspicion for underlying strangulated bowel and prompt urgent hernia exploration and repair.
31. DETERMINATION OF INDEPENDENT CLINICAL FACTORS FOR ANASTOMOTIC LEAK IN ACUTE CARE SURGERY

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BACKGROUND: Anastomotic leak (AL) after emergent intestinal operations can have devastating effects on patient outcomes. The objective of this study was to identify risk factors associated with intestinal AL in the era of acute care surgery in order to practically assist in surgical decision making.

METHODS: A retrospective review of the academic surgery database was performed from July 2009 to June 2013 to identify patients who had intestinal (small bowel [SB] and colon) anastomoses. The primary outcome was AL after emergent operation which was assessed according to 33 patient and operative factors using bivariate analysis. Variables considered for multivariate logistic regression model if they had p-value <0.25 in bivariate analysis.

RESULTS: Of the 682 patients (mean age 59.5±18.1, 53% female, median BMI 27.5 [23.2,33.2]) identified with anastomoses, the overall leak rate was 5% (38/682). Of these 97 (14%) [median age 52.6 (33.1,79.2) 42% female, median BMI 24 (19.8,30.8)] underwent an emergent operation with an AL rate of 9% (9/97). Anastomotic anatomy included SB to SB (74/97, 76%), SB to colon (18/97, 19%), colon to colon (5/97, 5%). Operations were categorized as open (81/97, 84%), laparoscopic (16/97, 16%). In bivariate analysis, gender, BMI, pulmonary disease, malnutrition, anticoagulation, anastomotic tension, use of drains and blood transfusion were statistically significant factors associated with AL. Of these factors in bivariate analysis, two were found to be independent predictors of AL in emergent operations using logistic regression model: use of drains (OR 7.6 [1.6-36]), peri-operative blood transfusion (OR 6.2 [1.1-35]).

CONCLUSION: Recognition of factors associated with AL after emergent intestinal operations can assist acute care surgeons in mitigating these risks in the peri-operative period and guide intra-operative decisions.
FACTORS THAT INFLUENCE SURGICAL MANAGEMENT OF LARGE BOWEL OBSTRUCTION

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BACKGROUND: Multiple interventions are available to surgeons for the management of large bowel obstruction. Obstruction location, root cause, patient status, and available hospital resources can alter treatment planning. For this study we sought to review the etiology and surgical management of large bowel obstruction at a county hospital to determine factors that influence management.

METHODS: A retrospective analysis of all surgically managed large bowel obstructions was performed from 2006 through early 2014. Patient demographics, etiology, adjunct procedures such as stent placement and type of surgical interventions were evaluated.

RESULTS: Ninety-three cases of large bowel obstruction were identified, with patient average age of 54 years and an even distribution among gender (52% male). Malignant bowel obstruction (74%) was the most prominent etiology, of which 82% were colon and rectal cancers (CRC). Metastatic disease from gynecologic primary (10%), as well as individual cases from lymphoma (n=2), breast (n=2), and lung cancer (n=1) were noted. Right sided pathology accounted for 15% of obstructions, of which 71% were from malignancy. All patients were initially treated with surgical intervention, with 43% undergoing primary anastomosis. Left sided pathology accounted for 85% of obstructions, of which 76% were due to malignancy, 13% to diverticular disease and 8% from sigmoid volvulus. Thirty six patients (46%) initially underwent diversion procedures while 7 (9%) had resection with primary anastomosis without any further intervention. Twenty four patients had colonic stents placed or attempted prior to surgical intervention. Eleven (46%) served as bridge to surgery, all for primary CRC, with seven (29%) others used for palliation. Four (17%) failed to provide decompression (3 from diverticular disease and 1 from a metastatic lesion) resulting in the need for immediate diversionary procedure. Two stents were unable to bypass the obstruction. Five out of 6 cases of sigmoid volvulus were successfully treated with initially with colonoscopy and rectal tube decompression. Resection for redundant sigmoid occurred an average of 8 days after initial decompression, with 4 primary anastomoses.

CONCLUSION: Primary CRC is the etiology for the majority of large bowel obstructions, but multiple other causes may lead to similar clinical presentation. Right sided obstructions were treated with surgery first, while left sided obstructions either underwent surgery or attempts at endoscopic decompression with stenting. Colonic stenting served as a bridge to surgery or for palliation when applied in obstruction due to CRC; it failed to offer decompression in cases of diverticular disease or metastatic cancer.
33. RISK FACTORS AND INFLUENCE OF SYSTEM TIME ON INCIDENCE OF ACUTE APPENDICITIS PERFORATION GIVEN THAT PATIENT’S TIME DELAY IS NOT A FACTOR
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Tucson, AZ

BACKGROUND: Several studies on acute appendicitis (AA) concluded that in-hospital delay (system time, ST) did not lead to increased complications (complication correlated with the incidence of perforation). However, many of these studies failed to control for patient time delay (patient time, PT) which played a significant role on AA perforation. In this study, we controlled PT delay and analyzed risk factors associated with AA perforation as well as how ST influenced the incidence of perforation.

METHODS: Using our prospectively maintained acute care surgery database from October 2009 through September 2013, we performed chart review on patients with AA. We collected demographic data, body mass index, presence of fecaliths, PT (i.e., time from abdominal symptom onset to time arrival in the emergency department (ED), ST (i.e., time from arrival in ED to time of surgical incision, and total time (TT) (i.e., PT+ST). We first performed logistic regression to identify risk factors associated with AA perforation after we controlled TT to < 36 hours. Subsequently, we analyzed the influence of ST at 6-hour interval on incidence of perforation after we controlled PT delay to less than 24 hours.

RESULTS: During our 4-year period, 747 patients were seen for possible AA. The incidence of perforation was 23% (n=172). When we analyzed patients whose TT<36 hours, we identified age > 50 (odds ratio [OR] 2.1; 95% confidence interval [CI], 1.4-3.1) and the presence of fecalith (OR, 2.52; 95% CI, 1.7-3.7) as significant risk factors for AA perforation. When we analyzed the influence of ST on AA perforation at 6-hours interval on patients whose PT < 24 hours, we did not observe increased risk of perforation with increased ST.

CONCLUSION: Age > 50 and the presence of fecalith place patient with AA at increased risk of perforation. ST delay did not increase incidence of AA perforation given that PT delay was eliminated. Future study that wants to analyze ST needs to look at AA patient with increased risk of perforation and presents to the hospital early.
BACKGROUND: Abdominal and pelvic fluid cultures are routinely obtained from patients during appendectomy, which are thought to help guide antimicrobial therapy. However, the utility of acquiring these cultures in patients with appendicitis is not well defined. Also, cost analysis is lacking. This study was conducted to identify if these culture results influenced management and if the costs supported antimicrobial and/or financial stewardship.

METHODS: After both university and hospital institutional review board approvals were obtained, a retrospective review was performed on all abdominal, peritoneal, and pelvic culture results from January 2008 to November 2013. Due to significant variation in antimicrobial management and limited provider documentation, cultures associated with pathology other than appendicitis were excluded. Only intraoperative, intraperitoneal cultures associated with appendicitis were included. Data collection included evaluation of the following: standard patient demographics, operative technique and details, microbiology results, how culture results influenced patient management, and costs of the cultures. Data for continuous variables are expressed as mean ± standard deviation.

RESULTS: During the study period, 70 patients with appendicitis had 140 culture samples tested. Mean patient age was 36.8 ± 25.6 years. Forty three patients were male (61%) and 27 female (39%). Appendectomies were performed via laparoscopy (5.7%), open (84.3%), and conversion from laparoscopy to open (10%) for both nonperforated (22.9%) and perforated appendicitis (72.9%). Culture results influenced management in only 4 patients (5.7%). There were 18 negative culture results. Five patients grew organisms resistant to antibiotics used; only 1 of which whom had change in his treatment as a result. On average, culture charges were $409 ± $112. Of the 5 patients with fungal cultures obtained, only 1 influenced antifungal therapy. In the 94% of patients whose cultures did not affect their management, the total culture charges were $26,764. The cost per change in management was $7,159.

CONCLUSION: Culture results from abdominopelvic fluid did not significantly influence the type or length of antibiotic/antifungal therapy. Similarly, the costs of these cultures appeared to be disproportionate to the low incidence of culture result utilization affecting patient care.
35. CAN ORAL CONTRAST COMPUTED TOMOGRAPHY SCAN AFFECT THE CLINICAL COURSE OF ADHESIVE SMALL BOWEL OBSTRUCTION?
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BACKGROUND: Deciding which adhesive small bowel obstruction (ASBO) patients need surgery remains difficult. Several studies have suggested that gastrogafin oral contrast challenge has both diagnostic and therapeutic values. So one would theoretically assume then that computed tomography (CT) scan performed with oral contrast would have a beneficial effect on the course of ASBO. This study analyzed the effect of CT oral contrast on the course of ASBO.

METHODS: Using our previously derived multi-institution prospective observational database of ASBO, we performed a separate analysis of ASBO patients whose CTs were performed with or without oral contrast. The decision to perform CT with (WC) or without oral contrast (WOC) was not protocolized in that study. Primary outcome was number of patients who underwent surgery. Secondary outcomes were duration of patients who had successful conservative treatment and hospital length of stay (HLOS).

RESULTS: There were 234 ASBO patients enrolled during 22-month study period; 5 patients had missing data, yielding 129 patients who had CT performed WC and 100 WOC. Overall, patients’ mean age was 59 ± 18 years; 52% were male, and 26% (N = 60) need surgical intervention. There was no difference between the groups on patients who need surgery (WC, 27% vs. WOC, 26%; P = 0.87). There were also no difference in duration among patients who were managed successfully with conservative treatment (WC, median 2 days; range 2-3 vs. WOC, median 2 days; range 1-3, P = 0.22) and HLOS (WC, median 4 days; range 3-8.5 vs. WOC, median 4; range 2-8, P = 0.24)

CONCLUSION: CT performed with oral contrast on ASBO patient did not have therapeutic effect in term of patients who need surgery and number of days of successful of conservative treatment. The oral contrast administered via CT may have a different quantity and quality effect than the oral contrast challenge being given in ASBO.
36. IS THE ACS NSQIP® SURGICAL RISK CALCULATOR APPLICABLE FOR BREAST CANCER PATIENTS UNDERGOING BREAST CONSERVING SURGERY?

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BACKGROUND: There has been a recent emphasis placed on the importance of the surgeon’s ethical and legal obligations to provide complete, accurate, and patient participatory informed consent discussion regarding operative risk. The ACS NSQIP® has developed a universal risk estimation tool to facilitate this process. The purpose of this study was to analyze the applicability of the NSQIP® risk calculator to patients undergoing breast conserving surgery (BCS) for breast cancer at our institution.

METHODS: After IRB approval, a prospectively maintained breast cancer registry at a community-based multidisciplinary breast center was queried to identify all patients diagnosed with breast cancer from 2010-2012. A retrospective review was performed to identify patients treated with BCS. Patients with benign or metastatic disease were excluded, as were those who had surgery elsewhere or had mastectomy. The risk calculator was applied to each patient to generate an individual risk profile. The performance of the universal risk calculator model was then evaluated using two metrics: the c-statistic and the Brier score.

RESULTS: There were 287 patients with a median age of 65 years. 55 (19%) had DCIS and 232 (81%) had invasive cancer. 69 (24%) underwent lumpectomy alone while 218 (76%) underwent lumpectomy with surgical axillary staging. Actual observed outcomes versus NSQIP® predicted outcomes, with performance analyses (Brier score, c-statistic), are as follows (NC=Not Calculated): Serious Complication 2.4% (n=7) vs 5.0% (0.024, 0.797); Any Complication 3.8% (n=11) vs 6.7% (0.042, 0.745); Pneumonia 0.3% (n=1) vs 0.1% (0.003, 0.954); Cardiac Complication 0.0% (n=0) vs 0.1% (<0.001, NC); Surgical Site Infection 2.4% (n=7) vs 1.1% (0.024, 0.538); Urinary Tract Infection 0.3% (n=1) vs 0.2% (<0.001, NC); Venous Thromboembolism 0.0% (n=0) vs 0.1% (<0.001, NC); Renal Failure 0.0% (n=0) vs 0.0% (<0.001, NC); Return to OR 1.0% (n=3) vs 5.0% (0.013, 0.673); Death 0.0% (n=0) vs 0.1% (<0.001, NC). In addition to the 3 patients that returned to the OR for wound complications, 37 patients returned for oncologic indications. Of these, 29 patients (10.1%) had positive margins, while 8 patients (2.7%) returned due to an upstage in diagnosis. Global analysis revealed Return to OR 13.9% (n=40) vs 5.0% (0.128, 0.529).

CONCLUSION: A low rate of complications was observed. The NSQIP® risk calculator performed adequately for all complications, with Brier scores of <0.05. This suggests a strong applicability to the informed consent process. However, a return to the OR after BCS for positive margins or an upstaged diagnosis of invasive cancer is the standard of care in breast cancer treatment. When factoring in these occurrences, the observed Return to OR rate of 13.9% is significantly higher than the predicted 5.0%. This deviation must be addressed when utilizing the NSQIP® risk calculator model during preoperative risk discussion with patients undergoing BCS at our institution.
BACKGROUND: Axillary lymph node dissection (ALND) had been considered the standard of care for lymph node metastasis of breast cancer for many years. The American College of Surgeons Oncology Group (ACOSOG) clinical trial Z0011 demonstrated equivalent overall survival and disease-free survival for breast cancer patients with limited lymph node involvement. These patients were treated with breast conservation surgery (BCS), sentinel lymph node dissection (SLND) and tangential whole-breast radiation, and then compared to patients who received the same treatment along with ALND. We investigated the impact of Z0011 on early breast cancer treatment in a large community hospital.

METHODS: All patients who underwent lumpectomy and SLND from January 2008 - December 2013 were analyzed in a retrospective review. Data was collected from clinical records which included demographics, surgical procedure, and pathology results. Z0011 guidelines were implemented in May, 2011 and patients treated before and after Z0011 implementation were compared. Statistical analysis was performed using IBM SPSS Statistics, Version 21.0 with Pearson’s χ² test and Fisher’s exact test.

RESULTS: Nine hundred and thirty-five patients had BCS and SLND during this time period. All patients were female and the two groups were similar with regard to age, histology and initial presentation. Ninety-six (18.8%) of 512 patients and 28 (6.6%) of 423 patients underwent ALND before and after the implementation of Z0011 respectively (p<0.05). The odds ratio of ALND was 0.307 (95% confidence interval [CI] 0.197-0.478) after Z0011 implementation. Among patients who underwent ALND, 21 (21.9%) of 96 patients and 12 (42.9%) of 28 patients had greater or equal to 3 lymph node metastases before and after the implementation of Z0011 respectively. (p<0.05) (Odds ratio was 4.886. Pearson χ²=0.027).

CONCLUSION: ALND incidence decreased significantly after the implementation of Z0011. Among all the patients who underwent ALND, a significantly higher percentage of patients with ALND had 3 or more involved lymph nodes after Z0011 adaptation. These results indicate rapid and successful implementation of recent clinical trial results. This resulted in a significant reduction in the number of patients exposed to potential morbidities of ALND.
BACKGROUND: Approximately 132,750 lumpectomies are performed annually in the United States for breast cancer, and 26,550 women undergo re-excision for close but negative margins. The position statement by the American Society of Breast Surgeons (ASBS) streamlines the indications for margin revision. Elimination of unnecessary re-excisions offers a potential saving of $31 million per year. This study computes the rate of post-lumpectomy margin re-excisions in breast cancer before and after the publication of the position statement.

METHODS: A retrospective analysis of a prospectively maintained quality assurance database between January 2009 and October 2014 was conducted. The patient pool before and after the ASBS position statement on lumpectomy margins in January 2013, was compared for the rate of margin revision. Pearson’s one-tailed chi-squared test without Yates correction was utilized to determine the significance of difference between the two groups.

RESULTS: Out of 565 breast cancer patients, 317 underwent lumpectomy (56.1%); 280 (88.3%) had a margin width of ≥ 1 mm. Number of lumpectomy patients with > 1mm margin pre and post ASBS position statement was 221 (90.2%) and 59 (81.9%); the number of margin revisions for these groups were 49 (21.7%) and 8 (13.6%) respectively [X2 (1, N = 280) = 2.131, p=0.072]. One (1.75%) patient was found to have residual disease in the revised margin; 19 (6.0%) patient ultimately had a mastectomy. One patient that refused margin revision and adjuvant therapy in the pre-position statement group, had a mastectomy a year later for local recurrence.

CONCLUSION: The collective review of evidence leading to a position statement has reduced the rate of margin revision in breast cancer patients undergoing lumpectomy (marginally significant). Larger registry based datasets are needed to confirm the impact of this guideline.
CENTRAL VENOUS PARATHYROID HORMONE MONITORING DURING MINIMALLY INVASIVE PARATHYROIDECTOMY: DESCRIPTION OF A NOVEL, SIMPLIFIED TECHNIQUE FOR SAMPLING THROUGH THE NECK INCISION WITH VALIDATION OF RESULTS

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BACKGROUND: Clinicopathologic and biochemical data was collected and retrospectively analyzed for 55 consecutive patients undergoing minimally invasive parathyroidectomy by a single surgeon between January, 2012 and October, 2014, utilizing central venous sampling for PTH levels. A novel, standardized anatomic approach was employed for central venipuncture through the small incision, by accessing the internal jugular vein between the sternohyoid and sternothyroid muscles cranial to the parathyroid venous drainage. Samples were drawn at baseline prior to entering or manipulating the central neck tissues, and at 10 minutes post-excision of all hyperfunctioning parathyroid tissue. A second cohort of 12 patients was prospectively studied by drawing simultaneous peripheral venous values and central values obtained by this method, and comparing levels between the two sampling sites. Central and peripheral values pre- and post-excision were compared, while also comparing percent decay of central and peripheral values.

METHODS: Clinicopathologic and biochemical data was collected and retrospectively analyzed for 55 consecutive patients undergoing minimally invasive parathyroidectomy by a single surgeon between January 2012 and October 2014, utilizing central venous sampling for PTH levels. A novel standardized anatomic approach was employed for central venipuncture through the small incision, by accessing the internal jugular vein between the sternohyoid and sternothyroid muscles cranial to the parathyroid venous drainage. Samples were drawn at baseline prior to entering or manipulating the central neck tissues, and at 10 minutes post-excision of all hyperfunctioning parathyroid tissue. A second cohort of 12 patients was prospectively studied by drawing simultaneous peripheral venous values and central values obtained by this method, and comparing levels between these two sampling sites. Central and peripheral values pre and post-excision were compared, while also comparing percent decay of central and peripheral values.

RESULTS: All central values independently met criteria for biochemical cure according to the Miami criteria. This is demonstrated in the prospective cohort of 12 patients and in all 55 patients analyzed retrospectively. While the mean post-excision central value (22±8.5) was slightly higher than the peripheral value (18.3±6.7), there was no significant difference seen when comparing the percentage decay of central and peripheral values, which were 84.36±10.2 % and 84.37±8.6% respectively. Therefore central values can be reliably utilized to accurately predict operative success.

CONCLUSION: Central venous sampling for PTH determinations utilizing this specific anatomic method closely approximates peripheral values, and accurately predict cure as the sole measurements obtained. This novel method facilitates minimally invasive parathyroidectomy by obviating the need to place, maintain, and troubleshoot peripheral venous access solely for PTH monitoring.
41. OUTCOMES AFTER PANCREATECTOMY WITH SURGICAL RESIDENT INVOLVEMENT: A NSQIP ANALYSIS
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BACKGROUND: Due to duty hour restrictions and other changes in surgical resident training, there are concerns that the presence of surgical residents may lead to poorer outcomes after certain surgical procedures. There are few large studies examining outcomes after pancreatectomy when surgical residents are involved.

METHODS: The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database from 2005-2010 was queried for all electively performed pancreatic resections. Multiple logistic regression models were constructed for outcomes such as total complications and mortality.

RESULTS: A total of 13,711 cases were identified; residents were involved in 85.0%. Total complications with and without the presence of residents were 34.3% and 32.5% respectively (p=0.11). Resident involvement was significantly protective of mortality (2.15% vs. 3.30%, p=0.01). On logistic regression, the presence of residents was not predictive of overall complications (p =0.36), while it remained protective of 30-day mortality (OR = 0.68, p = 0.01). Resident involvement was significantly associated with surgical site infections (OR = 1.21, p=0.04).

CONCLUSION: The presence of surgical residents during pancreatectomy does not increase 30-day morbidity. Mortality is decreased, although the underlying reasons for this remain to be determined. Pancreatectomy may be safely performed with surgical resident involvement.
BACKGROUND: Enhanced recovery-after-surgery (ERAS) pathways have been developed in an effort to improve overall patient outcomes. We evaluated hospital length of stay before and after an ERAS pathway implementation in order to determine its applicability/effectiveness within our institution.

METHODS: In early 2013, an ERAS pathway for the comprehensive care of patients undergoing small and large bowel operations was developed and implemented at our institution. Our hospital database was utilized for data collection on all patients undergoing colon/rectal and small bowel operations based on billing codes for small and large bowel surgeries. Data were compiled for the six months prior to and the six months following implementation of the ERAS. The post implementation data were further analyzed based on whether or not the various surgeons within our institution utilized an order set. Statistical analysis was completed using an t-test.

RESULTS: All patients undergoing small and large bowel operations within the six months prior to (n=242) and the six months post (n=328) ERAS implementation were identified. The average (median 7 days) length of stay following ERAS implementation decreased to 9.60 days from 10.90 days prior to implementation (p=0.05). The rate of compliance with ERAS as assessed by order set utilization improved from 38% to 70% during the six-month period following initiation. Overall, order set utilization was observed in 145/328 (44%) patients and for these patients the mean length of stay was 7.79 days (p<0.01).

CONCLUSION: We observed a statistically significant decrease in hospital length of stay following ERAS pathway implementation for patients undergoing small and large bowel operations within our institution. A further and more dramatic decrease in length of stay can be achieved with the addition and adherence to a standardized order set.
43. DOES SURGICAL RESECTION FOR LINITIS PLASTICA OF THE STOMACH IMPROVE OUTCOMES? ANALYSIS OF A POPULATION CANCER REGISTRY.
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Scottsdale, AZ

BACKGROUND: Gastric adenocarcinoma (GA) is a leading cause of cancer related death worldwide. A subset of gastric cancer, linitis plastica (LP), is characterized by diffuse tumor infiltration causing thickening and stiffening of the gastric wall. Traditionally, LP has been considered a fatal disease with few management options. Little evidence has been reported regarding prognostic factors and the role for surgical therapy in the treatment of LP. Our goal was to study the impact of surgery and adjuvant therapy on survival in these patients.

METHODS: We performed a retrospective review of GA patients with LP from the Surveillance, Epidemiology, and End Results (SEER) database (2004-2009). LP Patients were analyzed for differences from GA and factors associated with disease-specific survival.

RESULTS: Our study population was comprised of 29426 patients with GA, of whom 948 (3.2%) had linitis plastica. Compared to GA, patients with LP were younger (mean age 69 vs. 63, p<0.001), more likely female (37% vs. 49%, p<0.001), more likely to have metastatic disease at presentation (44.9% vs. 70.3%, p <0.001), more likely to have nodal involvement (50.6% vs 62.6%, p<0.001), and have higher tumor grade (68.1 % vs 94.1%, p<0.001). Patients with LP were less likely to undergo surgery (45.6% vs 36.9%, p<0.001) or radiation therapy (25.3% vs 17.7%, p<0.001) compared to GA. Near total or total gastrectomy was performed for 76% of LP patients compared to 51% of GA patients (p <0.001). After matching for AJCC stage, LP patients had significantly worse 5-year disease specific survival compared to GA; Stage I (27% vs. 67%), Stage II (19% vs. 49%), Stage III (6% vs. 29%), Stage IV (2% vs. 8%, all p values <0.001).

In the LP population, surgical resection (HR 0.55, 95%CI: 0.45-0.66) and radiation therapy (HR 0.71, 95%CI: 0.57-0.89) both decreased the chance of disease specific mortality, after controlling for AJCC stage, grade, race, and age. In LP patients with Stage I-III disease only, 159/260 (61%) of patients underwent surgery. The best survival outcomes in these potentially curable patients were seen in patients undergoing both surgery and radiation (median survival 25 months and 5 year disease specific survival of 16%). Patients who underwent neither surgery nor radiation had a median survival of 5 months.

CONCLUSION: The presence of linitis plastica is a marker of poor long term survival in gastric adenocarcinoma, independent of traditional prognostic factors such as T and N classification. Although selection bias may play a part, the best oncologic outcomes in these patients are achieved with multimodal therapy combining surgical resection with radiation therapy.
44. ENERGY-BASED HEPATIC RESECTION PROMOTES HYPOXIA INDUCIBLE FACTOR-1A-MEDIATED METASTASIS IN A MURINE MODEL OF PANCREATIC ADENOCARCINOMA
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BACKGROUND: BACKGROUND:

Electrocautery is a commonly employed energy-based surgical device used during hepatic resection. Post-resection, tumor recurrence and intrahepatic metastasis may be due to resection mediated-hepatic injury although the mechanism is unclear. Hypoxia inducible factor-1α (HIF-1α) is a transcription factor that modulates numerous cellular functions critical to tumor growth and metastasis and is upregulated in hepatic injury. We hypothesize that electrocautery induced hepatic injury promotes tumorigenesis via HIF-1α and inhibition of hepatic-tumor HIF-1α interaction will abrogate hepatic metastasis.

METHODS: METHODS:

The Pan02 murine pancreas adenocarcinoma cell line was modified using short-hairpin RNA targeting HIF-1α via lentiviral transduction to create Pan02-SH+ cells lacking HIF1α activity. Knockdown of HIF-1α activity by >80% was confirmed using polymerase chain reaction prior to injection of the tumor cells. C57/Bi6 mice underwent splenic injection of 200,000 Pan02 or Pan02-SH+ cells followed by hemisplenectomy to create intraabdominal metastatic tumor dissemination. Partial hepatectomy was performed using electrocautery removing a 4 x 20 mm portion of the right hepatic lobe. At 4 weeks, mice were euthanized and necropsy performed by blinded observers. Tumor burden was quantified by volume (calculated as height x width2) and discrete metastases. Statistical analysis was performed using one-way ANOVA and Kruskal-Wallis tests, with significance determined as α<0.05.

RESULTS: RESULTS:

Following hepatic resection, all mice developed metastases at the resection border. Mice injected with Pan02-SH+ cells lacking HIF-1α activity had decreased liver tumor volume (p = 0.0010) and reduced liver metastases (p = 0.0079) as compared to mice injected with Pan02 cells. Hepatectomy with electrocautery resulted in increased tumor volume (p = 0.0464) as compared to mice without partial hepatectomy. Additionally, the number of discrete liver metastases was higher in mice that receiving hepatectomy via electrocautery compared to mice without hepatectomy (p = 0.0038).

CONCLUSION: CONCLUSIONS:

Hepatectomy using electrocautery induced local tumorigenesis and increased metastasis in a murine pancreatic adenocarcinoma model. Inhibition of the HIF-1α tumor-hepatic interaction markedly reduced tumor progression. Based on these data, further investigation of HIF-1α mediated tumor progression is warranted.
BACKGROUND: Current NCCN guidelines for patients with locally advanced esophageal adenocarcinoma include neoadjuvant chemoradiotherapy (NAC) and surgical resection. Overall survival is significantly better in patients who obtain pathologic complete response (pCR) after NAC. Reported pCR rates range from 10-49% but are difficult to interpret as most studies have combined histologies and many different NAC regimens. Complete clinical response after NAC can be hard to evaluate and ranges from 0-59%. Controversy exists on the need for surgical resection after apparent complete clinical response. This study aims to identify the rate of pCR in patients treated with NAC and the need for surgical resection.

METHODS: A retrospective chart review was performed on patients with adenocarcinoma of the distal esophagus or gastroesophageal junction from Jan 2005 to Dec 2013 who received NAC with subsequent surgical resection. Data collected included demographics, preoperative clinical stage, and type of neoadjuvant therapy. Surgical data included timing of surgery, type of resection, and postoperative morbidity and mortality. Pathologic data included pathologic response, pathologic staging, and margin status. Pathologic response was classified as downstaged, upstaged, or unchanged.

RESULTS: 40 patients fit inclusion criteria of which 35(87.5%) were male. Median age at diagnosis was 60 (range 33-83). Preoperative clinical staging revealed stage 1 – 3(7.5%), stage 2 – 18(45%), stage 3 – 19(47.5%). 39(97.5%) received NAC with a platinum based agent (cis-platin-67.5%, carboplatin-27.5%, oxilplatin-2.5%). After neoadjuvant therapy 24(60%) were downstaged, 5(12.5%) were upstaged and in 11(28%) stage was unchanged. Surgical resection consisted of transhiatal esophagectomy in 25(62.5%) and Ivor-Lewis esophagectomy in 13(32.5%). Final pathology revealed 5(12.5%) with pCR, and 35(87.5%) with residual disease. 4(10%) had residual disease in lymph nodes only (T0N1).

CONCLUSION: Trimodality therapy (NAC followed by surgical resection) is best for curative treatment of esophageal adenocarcinoma. Surgical resection is indicated regardless of apparent clinical response, as almost 90% of patients will have residual disease after neoadjuvant therapy. Regional lymph node dissection is important, as up to 10% of patients will have residual disease in lymph nodes only.
BACKGROUND: Post-operative pain management is a major challenge in CRS/HIPEC. Inadequate pain control can contribute to complications and extend recovery time. The safety and efficacy of regional pain control (epidural catheters) has not been described in CRS/HIPEC. Likewise, EC safety with Dextran prophylaxis has never been reported. VTE risk without prophylaxis approximates 30-50%, and with contemporary prophylaxis the incidence ranges from 10-20% in CRS/HIPEC. Balancing bleeding risks with VTE is one of the many challenges in this patient population.

METHODS: Retrospective analysis was performed on 76 CRS/HIPEC patients. Epidurals were placed prior to dextran which was started in the OR preceding surgery. The duration of epidural, time to pain control, complication, need for additional analgesics, and median LOS were collected. Also perioperative bleeding and VTE rates in-hospital and 30-days were determined.

RESULTS: All patients tolerated dextran and EC therapy. Pain was well controlled with EC alone in 70% of patients, and optimal pain control was reached within 1 hour post-op. No complications were observed with EC, and median duration of therapy was 5 days. LOS was 11 days, and VTE occurred in 5.3% of patients at 30-days. There were 2 lower extremity DVTs, 1 catheter related upper extremity DVT, and 1 DVT/PE in a patient with previous VTE.

CONCLUSION: EC regional pain control is a safe and effective option for CRS/HIPEC patients. This is the first report to demonstrate that Dextran is safe to use with epidural catheters, and observed VTE events are consistent with heparin based prophylaxis.
BACKGROUND: Sentinel lymph node (SLN) biopsy is the standard procedure to stage the lymph node basin in patients with melanoma. Recent reports have demonstrated the addition of single photon-emission computed tomograph/computed tomography (SPECT-CT) improves SLN detection and subsequent survival. We evaluated the impact SPECT-CT has on our melanoma population.

METHODS: We performed a retrospective analysis on a prospectively maintained melanoma SLN database for patients treated between 1997-2013. All patients underwent lymphoscintigraphy. Beginning in 2006, SPECT-CT was added to the pre-operative lymph node evaluation for all patients. Outcome measures included local-regional recurrence, recurrence-free survival, overall survival, and melanoma-specific survival.

RESULTS: A total of 745 patients were studied, of whom 429 underwent standard lymphoscintigraphy and SLN biopsy and 316 had additional SPECT-CT. Between the two groups, there was no significant difference in age (p=0.15), gender (p=0.53), location of primary tumor (p=0.89), depth (p=0.60), mitotic rate (p=0.20), or rate of SLN metastases (p=0.85). The number SLNs removed by the surgeon (p=0.61) and the number of lymph node basins dissected per patient (p=0.71) was not significantly different between the groups. There was a difference in melanoma-specific survival at five years that approached statistical significance (87% vs. 96%, 95% CI 0.29 – 1.02; p=0.06) favoring patients who underwent SPECT-CT. There was no difference in local-regional recurrence, (88% vs. 91%, 95% CI 0.65–1.65; p=0.9), recurrence-free survival (60% vs. 78%, 95% CI 0.83–1.52; p=0.45), and overall survival (65% vs. 85%, 95% CI 0.76–1.53; p=0.67). Evaluation of the patients based upon melanoma location (head and neck, trunk, or extremity) also did not demonstrate a significant difference in outcomes.

CONCLUSION: Unlike other reported series, SPECT-CT in addition to lymphoscintigraphy did not significantly impact outcomes among the melanoma patients in this cohort. The perception of the surgeons that it facilitates identification and removal of the sentinel lymph node especially in the head and neck area were not reflected in these outcomes but could impact other unmeasured factors such as operative time or morbidity.
BACKGROUND: The prognosis and management of rectal carcinoma depends largely on the stage of the tumor. Imaging plays a crucial role in the preoperative staging and thus, management of rectal carcinoma. Staging is important to distinguish patients that require local excisions from those that require a more radical excision as well as identify those that require preoperative neoadjuvant therapy to downstage the tumor. Currently, various combinations of imaging modalities are used in the preoperative staging of rectal cancer. The aim of this study is to analyze the use of MRI as the sole imaging modality for rectal cancer staging.

METHODS: Using the University of Oklahoma Health Science Center EMR (Meditech), all patients with a biopsy-proven rectal adenocarcinoma who were diagnosed between 2008 and 2013 were identified. Patients were then placed into two groups: those who received only preoperative MRI and those who received a combination of preoperative imaging. The combination group includes any combination of CT, EUS, or MRI. Eighteen patients received MRI alone and forty-one patients received combination imaging. A total of fifty-nine patients were identified for this study, 28 of which received neoadjuvant therapy.

Pre-Operative classification of tumor location, staging and CRM involvement by MRI alone and combination imaging were compared to post-operative findings. This study also compared MRI to other imaging modalities in the ability to differentiate between TII and TIII tumors. Cohen's kappa coefficient statistic was used to calculate agreement between Pre- and post-operative classification of tumor. SAS 9.3 was used to do the analysis.

RESULTS: It was found that MRI alone was equal to combination imaging in regards to determining tumor location, n-stage and t-stage, including distinguishing between T2 and T3. Combination Imaging was found to be superior to MRI alone at determining tumor distance from the anal verge. After excluding patients who received neoadjuvant therapy, MRI alone was equal to Combination Imaging in predicting tumor size.

CONCLUSION: MRI alone was as accurate as combination imaging in distinguishing between T2 and T3, which is an important determinant of neoadjuvant therapy. Since MRI Alone is equal to Combination Imaging, it seems unnecessary to undergo the extra cost and time of additional imaging studies. In addition to decreased cost and a decreased number of visits, MRI also has less radiation than CT. MRI has several known benefits to CT including the ability to visualize the peritoneal reflection, the CRM, and liver metastases less than 5mm. Using MRI alone for the staging of rectal adenocarcinoma allows multidisciplinary teams to establish a "common language" to avoid issues such as misinterpretation and miscommunication.
50. CONGESTIVE HEART FAILURE IS ASSOCIATED WITH INCREASED RISK OF PNEUMONIA, RE-INTUBATION, AND DEATH FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY: A NSQIP DATABASE REVIEW
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BACKGROUND: Laparoscopic cholecystectomy (LC) is the gold standard operation for gallbladder disease in patients of all ages with a variety of medical conditions. Elective LC has been performed as an outpatient operation for nearly 15 years. Few studies have examined the impact of specific co-morbidities on outcomes after LC and determined if certain co-morbidities may benefit from post-operative admission. Congestive heart failure (CHF) is a common co-morbidity that necessitates appropriate peri-operative management. This study aims to quantify adverse events after LC and determine if patients with CHF should be admitted following LC.

METHODS: This is a retrospective review of all adult patients undergoing laparoscopic cholecystectomy recorded in the NSQIP database between 2005-2012. Exclusion criteria were pregnancy, disseminated cancer, recent chemotherapy or radiation, and liver disease. Included patients were categorized into elective and emergent populations. Bivariate and multivariate analyses determined the impact of CHF on post-operative complications.

RESULTS: Laparoscopic cholecystectomies were performed electively in 131,081 patients and emergently in 12,680 patients. Congestive heart failure was more common in older patients and accounted for 0.38% of elective and 0.62% of emergent operations. Pneumonia, re-intubation and death occurred in 9% of elective and 17% of emergent operations in CHF patients. Bivariate analysis revealed a relative risk for pulmonary complications of 16.6 in the elective and 12.98 in the emergent populations. The multivariate analysis demonstrated patients with CHF were nearly four times more likely to suffer from these outcomes. Other co-morbidities contributing to respiratory complications included age, BMI, COPD and dyspnea.

CONCLUSION: Laparoscopic cholecystectomy is a safe operation, but patient co-morbidities affect surgical outcomes. Congestive heart failure is associated with potentially severe pulmonary complications after LC, including pneumonia, re-intubation and death. This study demonstrates that patients with CHF need appropriate pre-operative counseling and management to improve outcomes after laparoscopic cholecystectomy. Patients with CHF may benefit from post-operative admission following LC for prevention of pulmonary complications.
BACKGROUND: The use of oral anticoagulants is pervasive in the elderly. However upon injury these patients often require urgent reversal of anticoagulation due to life threatening hemorrhage or surgery. Little has been reported on efficacy of 3-factor (Bebulin) vs. 4-factor (KCentra) prothrombin complex concentrates (PCC). The objective of this study was to compare efficacy, adverse effects and cost-effectiveness of 3-factor vs. 4-factor PCC product.

METHODS: This retrospective review identified trauma patients with coagulopathy secondary to oral anticoagulants with an INR ≥ 1.5 who received 3-factor PCC or 4-factor PCC from 2012 to 2014. Data assessed were demographics, mechanism of injury, anticoagulants, INR, blood products administered, adverse drug events, indication for anticoagulants, efficacy and cost. Efficacy was determined by assessing the first INR post-PCC administration and successful reversal was defined as INR < 1.5. Adverse effects included any thrombotic episode post-administration and cost-effectiveness was determined using cost (drug acquisition price) per successful reversal.

RESULTS: There were 64 patients: 46 patients received 3-factor and 18 patients received 4-factor PCC. Patient demographics were similar. The baseline INR was 3.1 ± 2.3 and 3.4 ± 3.7 for 3- and 4-factor PCC, respectively (p=.520). The average unit dose was 30 ± 13 for 3-factor and 26 ± 6 units/kg for 4-factor PCC (p=.198). A second dose was required for 17% of 3-factor PCC patients and 0% of 4-factor PCC patients (p=.093). INR post administration was 1.6 ± 0.6 (3-factor PCC) vs. 1.3 ± 0.2 (4-factor PCC), p=.001. Successful reversal occurred in 50% and 83% of 3- and 4-factor PCC patients respectively (p .022). Thrombotic event rates were not statistically different between in both groups (15% vs. 0%, p=.177). Cost-effectiveness favored 4-factor PCC ($5382 vs. $3797).

CONCLUSION: The 4-factor PCC was more efficacious than 3-factor PCC for urgent reversal of anticoagulation in injured patients without an increase in thrombotic events. 4-factor PCC was more cost-effective. Hospitals and patients may benefit when providers replace 3-factor PCC with 4-factor PCC for this indication. Future prospective and long term follow-up studies are needed to validate our observations.
53. POST-EXTUBATION STRIDOR IN TRAUMA PATIENTS: A BREATHTAKING PROBLEM
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BACKGROUND: Extubation failure is a common complication in intensive care units (ICUs), leading to increased time on the ventilator, longer hospital stays, and higher rates of morbidity and mortality. Risk factors for extubation failure have been reported in the medical ICU literature; however, there is relatively little literature specifically examining causes of extubation failure in the trauma ICU. Post-extubation stridor (PES) has been identified as an infrequent cause of extubation failure. We hypothesized that PES is a more frequent cause of extubation failure than previously thought. The purpose of this study was to better define the causes of extubation failure (including for PES) and their risk factors in trauma patients.

METHODS: A retrospective review of all intubated patients was performed at an ACS verified level 1 trauma center from 5/07-5/14. Patients were divided into 3 categories: failed extubation with stridor (FS), failed extubation without stridor (FE), or successful extubation (SE). Patients in the stridor group were matched with successfully extubated patients for age, gender, and injury severity score (ISS). Data collected included patient demographics, injury related information, and details of intubation and extubation. Statistical analysis was performed using paired t-tests, independent t-tests, and Chi-square tests. Significance was attributed to a p value < 0.05.

RESULTS: During the seven year study period, there were 3127 intubated trauma patients; 1400 were excluded due to intubation less than 24 hours, death, transfer, or tracheostomy prior to an extubation attempt. 1597 patients were successfully extubated during the initial attempt, but 130 (7.5%) required reintubation following their initial extubation and 42 (32.3%) of these failed extubations were due to stridor.

Comparing FS with SE, patients in the FS group were significantly more likely to have been intubated for ≥5 days prior to first extubation (FS=71%, SE=44%, p=0.02). Patients that failed extubation for PES had longer ICU lengths of stay (FS=15±6, SE=8±8; p<0.001) and more days on the ventilator (FS=14±7, SE=5±4; p<0.001) than the SE group. Comparing FS to FE, the stridorous patients were more likely to be female (FS=45%, FE=22%, p=0.008) or under the age of 18 (FS=76%, FE=4%, p=0.001). There were no differences in abbreviated injury score for head/neck, abdomen or extremities between groups, and no difference in endotracheal tube size.

CONCLUSION: PES in trauma patients constitutes a significantly larger proportion of total reintubations than previously reported. This group represents an at-risk population and an opportunity for intervention to reduce reintubation rates. A prospective study is being undertaken to further delineate and mitigate specific risk factors for PES.
54. FACTORS ASSOCIATED WITH CLINICAL DECOMPENSATION REQUIRING RAPID RESPONSE TEAM ACTIVATION WITHIN 24 HOURS OF EMERGENCY DEPARTMENT ADMISSION
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BACKGROUND: Rapid Response Teams (RRT) have been utilized to provide expert assessment, early intervention, and rapid stabilization of patients to prevent clinical deterioration or arrest. We reviewed all patients undergoing RRT evaluation on a Medical-Surgical (MedSurg) unit within 24 hours (hrs) of admission from the Emergency Department (ED) to determine factors associated with early clinical decompensation and identify opportunities for improvement in patient placement and outcomes.

METHODS: This study included all patients undergoing an RRT within 24 hrs of MedSurg unit admission from the ED over an 18 month period (January 2013 through June 2014) in one tertiary community hospital. All cases were reviewed on a monthly basis by our hospital's Emergency Response Team. Cases were then forwarded for review by a designated ED physician and ED RN to determine whether the patient was mistriaged and whether this affected patient outcomes. We reviewed each case for indication for RRT, whether patient required transfer to a higher level of care or increased monitoring.

RESULTS: There were a total of 125 RRTs within 24 hours of MedSurg unit admission from the ED with 65 (52%) requiring transfer to a higher level of care. From January through June 2013, there were 61 RRTs within 24 hrs of MedSurg unit admission from the ED with 31 (51%) requiring transfer to a higher level of care and 5 (8%) progressing to code blue status. From July through December 2013, there were 43 RRTs within 24 hrs of MedSurg unit admission from the ED with 21 (49%) requiring transfer to a higher level of care and 7 (16%) progressing to code blue status. From January through June 2014, there were 21 RRTs within 24 hrs of MedSurg unit admission from the ED with 13 (62%) requiring transfer to a higher level of care and 1 (5%) progressing to code blue status. Indications for RRT were categorized for each patient with up to two reasons noted per patient: acute mental status change in 80 (22.9%), bradycardia (HR<40) in 12 (3.4%), chest pain in 10 (2.9%), fall in 3 (0.9%), concern by RN in 61 (17.5%), desaturation (SpO2 < 90%) in 51 (14.6%), failure to respond to treatment in 7 (2.0%), hypopnea (RR<8) in 2 (0.6%), hypotension (SBP<90mmHg) in 58 (16.6%), seizure in 6 (1.7%), significant hemorrhage in 6 (1.7%), tachycardia (HR>130) in 34 (9.7%), and tachypnea (RR>24) in 19 (5.4%).

CONCLUSION: We have seen a significant decrease in RRT activations within 24 hrs of MedSurg unit admission from the ED with diligent physician review and feedback of cases. The most common causes of RRT activation within 24 hrs of admission from the ED are acute mental status change, concern by RN, hypotension, and desaturation. Thorough ED evaluation for disease processes that can lead to acute mental status change, hypotension and desaturation may lead to earlier treatment and ICU admission, avoiding mistriage to lower levels of inpatient care.
55. HANDOFFS IN THE INTENSIVE CARE UNIT: WORSE DURING OFF HOURS?
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BACKGROUND: Communication failures during handoffs are common and associated with adverse events and patient harm. Operating room (OR) to intensive care unit (ICU) handoffs are especially complex, involving simultaneous communication between multiple teams (anesthesia, surgery, and critical care) in addition to patient and equipment transfer. We hypothesized that bedside handoff quality diminishes during night and weekend hours, and that bedside handoff practices are similar in high and moderate volume ICUs of the same health system.

METHODS: OR-to-ICU bedside handoffs were assessed in two surgical ICUs (ICU1 = high volume, 210 admissions/month; ICU 2 = moderate volume, 125 admissions/month) within the same tertiary care university health system. Trained research staff directly observed and scored bedside handoffs at all times of day using an assessment metric evaluating: duration and number of people in room during the encounter; number of content items omitted from reports; quality of transmitter delivery, teamwork, and professionalism; number of passive/active listening skills of receiving provider; and existence of a receiving provider physical exam. Within each ICU, weekday (0700-1700, M-F) and night/weekend scores were compared using t-test and Chi square analyses. Overall scores were also compared between the ICUs.

RESULTS: In ICU1, good transmitter delivery scores (satisfactory or better) were significantly more common during nights and weekends (91%) than weekdays (65%, p<0.01). Other metrics tended to also be better on non-weekday than weekday hours. In ICU2, there were no significant differences between weekday and non-weekday hours in any of the measures. ICU1 scored significantly better than ICU2 across all but one handoff quality measure at all times, particularly in teamwork (rated satisfactory or better 5.9 times more often, p<0.001), content omissions (49% fewer, p<0.001) and encounter length (144% longer, p<0.01).

CONCLUSION: Contrary to the hypotheses, bedside handoff practices appear to be equal or slightly better on nights and weekends in a high volume surgical ICU and dissimilar between ICUs in the same health system. In a higher volume ICU this could indicate an emphasis on the bedside handoff during off hours, and a higher vigilance during times when resources are restricted. Lower volume ICUs with presumably fewer resources may not be adequately equipped to conduct proper bedside handoffs. Specific handoff practices merit evaluation and training implementation to ensure consistent ICU practices at different times and different locations.
BACKGROUND: Avoiding unnecessary administration of blood products is difficult in the trauma patient, as transfusion of blood products when there is concern for bleeding is advocated. However, aggressive use may lead to transfusion of blood products in patients who do not necessarily need them. There are risks to the use of blood for patients for whom it is not indicated. We sought to identify trauma patients who received a low volume transfusion at our hospital to identify whether there is room for improvement by potentially avoiding transfusions.

METHODS: We queried the trauma registry at our level I trauma center from 2011-2013 for patients who received 1 to 3 units of packed red blood cells (PRBC) during their hospitalization. We performed an individual chart review to identify patient data including the hematocrit level (hct) and reason for transfusion decisions. We also analyzed the timing of the transfusion and the nadir hct during the hospital stay and the last hct prior to discharge. Timing of transfusion was divided into early (E, <24 hours) and late (L, >24 hours after admission).

RESULTS: Over a two year period we identified 74 trauma patients who met criteria and all analysis was done on these. Average age of these patients was 59 years. Average ISS was 14.9. Just prior to transfusion 63 patients (85%) had a systolic blood pressure (SBP) >90 mmHg, and 40 (54%) had a heart rate (HR) of less than 90 beats per minute. The mean hct prior to discharge was 30.7.

For the thirty E patients the average hct was 32% at the time of transfusion. None of these patients had a low hct (< 21%) recorded during their admission and were discharged with a mean hct of 31%. Of the forty-four patients in L (59%) the mean pre-transfusion hematocrit was 25% and the discharge hct was 31%. Transfusion reason was listed as a low hematocrit in 51 (69%) patients, hypovolemia in 19 (26%) with other for the remaining four patients.

Complications occurred in 24 (32%) with the majority, 19, infectious. Most (68%) of these infectious complications were in patients over age 50. One patient developed a transfusion associated acute lung injury (TRALI). There were no deaths.

CONCLUSION: Most trauma patients in our trauma center who received low volume red blood cell transfusion had normal vital signs, a hct > 21%, and received their transfusion more than 24 hours after arrival. These data suggests that many of these low volume transfusions were potentially unnecessary and should remind us to be more critical in future transfusion decisions.
BACKGROUND: In recent years, trampoline recreation parks have increased in popularity. However, the American Academy of Pediatrics has long cautioned against the recreational use of trampolines. Despite safety guidelines and supervision, trampoline parks are facing litigation for injuries occurring at their facilities. The purpose of this study is to compare trampoline-related injuries occurring at home to those occurring at sports/recreation parks to determine if presumed safety measures and supervision results in less severe injuries.

METHODS: The National Electronic Injury Surveillance System (NEISS) was used to examine all cases of trampoline-related injury treated in U.S. emergency rooms from 2006-2012. Injuries sustained at home were compared to those occurring at sports/recreation parks in terms of demographics, hospitalization, and injury type and location.

RESULTS: An estimated 690,013 (95% CI: 574,147 to 805,879) trampoline-related injuries were treated in emergency rooms in the U.S. during the study period. The majority of injuries occurred in males (53.58%) and children 16 years old and younger (90.30%) with a mean age of 9.98 years old. The majority of injuries occurred at home (63%), and 3.34% of injuries occurred at sports/recreation centers; however, the incidence of injuries occurring at sports/recreation parks increased by 203% (1,635 in 2006 to 4,958 in 2012) over the study period. When comparing patients whose injuries occurred at home to those whose injuries occurred at sports/recreation parks, patients were younger (age ≤16 90.5% vs 84.8%, OR: 1.70, 95% CI: 1.38-2.11, p<0.0001) and more likely to be male (54.13% vs 49.86%, OR: 1.19, 95% CI: 1.02 to 1.38, p: 0.026). Hospital admission rates were the same in both groups (5.62% vs 5.20%, OR: 1.09, 95% CI: 0.77-1.52, p: 0.64). When comparing the types of injuries, the rate of lacerations differed between the two groups (10.67% at home vs 8.29% at sports/recreation facilities, OR: 1.32, 95% CI: 1.01 to 1.74, p: 0.04), whereas the rate of fractures, dislocations, soft tissue injuries, internal organ injuries, and concussions were not significantly different.

CONCLUSION: Discussion: Comparison of injuries occurring at home to those occurring at sports/recreation parks shows a similar injury pattern, despite presumed safety regulations and supervision. The recreational use of trampolines has been discouraged by physicians for many years because of the alarming rates of injuries associated with their use. Trampoline recreation parks are no safer than privately owned recreational trampolines. Therefore, the use of these trampoline parks should also be discouraged until better oversight can be established.
HYPOALBUMINEMIA AT ADMISSION IS ASSOCIATED WITH INCREASED INCIDENCE OF IN-HOSPITAL COMPLICATIONS IN GERIATRIC PATIENTS SUSTAINING SEVERE INJURIES

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BACKGROUND: Elderly patients are at an increased risk of protein-energy malnutrition (PEM) which is associated with impaired wound healing, increased infectious morbidity, multi-organ dysfunction, prolonged hospitalization and disproportionate mortality. Despite a high incidence of multi-system and non-extremity injuries in the elderly, most prior studies on nutritional predictors of outcomes in older patients have narrowly focused on those with hip fractures. Studies addressing nutritional risk factors in geriatric patients sustaining severe single or multisystem injuries are lacking. We evaluated the association between hypoalbuminemia at admission (as a marker of pre-injury PEM) and 30-day incidence of in-hospital infectious and non-infectious complications.

METHODS: This was a nested case-control with incidence density sampling conducted within a prospective cohort study of geriatric trauma patients 55 years and older treated at a Level I trauma center between May 2013 and March 2014. Eligibility criteria included hospital length of stay of at least 3 days and at least 1 day stay in the intensive care unit. Exposure of interest was albumin level at admission dichotomously defined as either PEM (albumin <3.6g/dl) or NO PEM (albumin >=3.6g/dl). The outcome of interest was 30-day incidence of complications. Covariates of interest included patient demographics, body mass index, mechanism of injury, initial ED vital signs, EMS/ED intubation, tube feeding status, injury pattern and severity, and pre-existing comorbidity.

RESULTS: A total of 130 patients met study eligibility. Of these, 86 (66%, 95%CI: 58-74%) had hypo-albuminemia at admission and were therefore considered to be protein energy malnourished. Unadjusted comparisons showed no significant (p>0.05) differences by PEM status in the distribution of age, gender, BMI, race, mechanism of injury, EMS/ED intubation, initial ED vital signs, injury severity scores (ISS), multisystem trauma, and comorbidity. However, compared to the NO PEM group, patients in the PEM group were significantly (p<0.05) more likely to be taken to the OR from the ED, had disproportionately more severe abdominal injuries and, were predominantly female (p<0.09) and more likely to be tube fed (p<0.05). After adjusting for tube feeding and ISS, PEM at admission was associated with a two-fold increase in the risk of 30-day overall hospital complications (OR=2.2, 95%CI: 1.2-4.1) and an even higher risk of infectious complications (OR=2.5, 95%CI: 1.2-5.1).

CONCLUSION: Serum albumin level at admission is a significant predictor of in-hospital complications especially, of infectious complications in geriatric patients sustaining severe injuries. This relatively low-cost, easily obtainable test should be used more often as a prognostic tool to detect malnutrition and to predict risk of in-hospital complications, particularly in the geriatric patient population in whom comorbid conditions are relatively frequent.
BACKGROUND: Non-operative management (NOM) of blunt splenic injury has success rates from 93%-98%. Controversy exists over the safe period of observation for NOM prior to discharge. Published guidelines in 2008 included a normal physical exam, hemoglobin checks every 6 hours for 24 hours for all grades, and then every 12 hours until stable for grades 2-5. The success rate using these guidelines was 96%, but the study was predominantly grades 1 and 2 injuries. The purpose of this study was to investigate the safety and efficacy of these guidelines in a larger group of patients, including a large number of patients with grades 3-5 injuries.

METHODS: A retrospective review of all trauma patients with blunt splenic injuries was performed at an ACS verified Level 1 Trauma Center from 7/2007-5/2014. Patients who did not require emergent laparatomy were included in this study. Patients who died or were transferred to another hospital prior to the resolution of their splenic injuries were excluded from analysis. Data collected included patient demographics, injury related information, hospital length of stay, and initial spleen management outcomes. Statistical analysis was performed using 2-tailed independent t-tests and one-way analysis of variance. Significance was attributed to a p-value < 0.05.

RESULTS: During the study period, there were 708 patients with blunt splenic injury. 235 were excluded (OR=141, transfers=5, death=79), leaving 473 NOM patients. 44% (192/435) of these patients had grades 3-5 splenic injuries. Using our guidelines, NOM was successful in 95% of all patients and 93% of grades 3-5 injuries. 55% of patients that failed NOM did so within the first 72 hours and 77% failed within 5 days. 20/22 of these patients failed NOM during the initial hospital stay. The risk factors associated with failed NOM were older age (44 vs 35) and higher injury severity score (26 vs 19) (p=0.037; p=0.001, respectively). NOM was successful in 97% of patients (62/64) with isolated splenic injuries. Hospital length of stay differed between splenic grades in patients with isolated injury (p=0.001), with higher grade injuries having longer hospital stays (grade 1=1.6 days; grade 5= 4.5 days).

CONCLUSION: NOM following our institutional guidelines had a 95% success rate which included 192/435(44%) of high grade injuries. All but 2 patients failed NOM during their initial hospital stay. Therefore, patients undergoing NOM for splenic injury may be safely discharged if they have stable hemoglobins and a normal physical exam including patients with higher grade splenic injuries.
60. A NEGATIVE URINALYSIS IS ASSOCIATED WITH AN EXTREMELY LOW LIKELIHOOD OF INTRA-ABDOMINAL INJURY AFTER BLUNT ABDOMINAL TRAUMA
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BACKGROUND: The utility of routine urinalysis (UA) after blunt abdominal trauma (BAT) remains controversial, particularly with increased use of computed tomography. The purpose of this study was to determine the diagnostic significance of a UA after BAT. We hypothesize that a normal UA will be associated with a very low risk for both genitourinary (GU) injury and intra-abdominal (IA) injury.

METHODS: This is a retrospective review of all patients ≥18 years old admitted for blunt abdominal trauma from January 2011 to January 2013 at a level I trauma center. Patients with a UA within 12 hours of arrival were included. Patients with gross hematuria, initial trauma workup at another facility, or no UA results were excluded. The presence of any red blood cell or hemoglobin in the specimen was considered a positive study. The sensitivity (SN), specificity (SP), predictive values and likelihood ratios of UA were calculated for GUI, IAI and those injuries that required intervention.

RESULTS: We identified 1795 patients meeting inclusion criteria. The majority (64%) were male with a mean age of 44±21 years and mean Injury Severity Score of 13±10. Eight hundred and ten patients (45.1%) had a negative UA. Only two of these patients (2/810 patients, 0.2%) had GU injuries and none (0%) required intervention. Thirty-two of these patients (32/810, 4%) had an IA injury and two (2/810 patients, 0.2%) required an intervention.

The sensitivity (SN), specificity (SP), positive and negative predictive values (PPV and NPV respectively) of a UA after BAT were calculated. The characteristics of a UA for any IAI are as follows: SN 0.85, SP 0.45, PPV 0.175, NPV 0.96. The characteristics of a UA for an IAI requiring intervention are as follows: SN 0.96, SP 0.46, PPV 0.05, NPV 0.99. The characteristics of a UA for any GUI injury are as follows: SN 0.98, SP 0.46, PPV 0.05, NPV 0.99. The characteristics of a UA for any GUI requiring intervention are as follows: SN 0.98, SP 0.46, PPV 0.05, NPV 0.99.

CONCLUSION: A negative UA indicates low risk for genitourinary or intra-abdominal injury, and even lower risk for injury requiring intervention. Without other indications for imaging, observation of patients with a negative UA after blunt abdominal trauma should be considered and may decrease the number of negative radiographic studies obtained after blunt abdominal trauma.
61. THE IMPACT OF METHAMPHETAMINE USE ON TRAUMA PATIENTS AT A LEVEL 1 TRAUMA CENTER: A 10-YEAR RETROSPECTIVE REVIEW
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BACKGROUND: Methamphetamine (MA) users have a disproportionate number of traumatic injuries compared to the general population. The effects of MA on trauma outcomes have been evaluated, but many of the results have been discordant and may represent geographically limited populations. Further study is needed to assess the impact of MA use on hospital and ICU length of stay (H-LOS and I-LOS), ventilator use, and mortality.

METHODS: A retrospective review was performed of all adult patients presenting at a level 1 trauma center between 1/1/2004 and 12/31/2013 who received a urine drug screen (UDS). Demographics, Injury Severity Score (ISS), UDS results, I-LOS, H-LOS, duration of ventilator use (V-days), discharge disposition, and mortality were extracted from the database. Patients were categorized into four groups: negative test results (NTR), positive for MA only (MA), positive for poly-substance use without MA (PS), positive for poly-substance use with MA (PS/MA). Logistic regression analysis was used to identify factors associated with mortality.

RESULTS: Among the 2,321 subjects included in the final analysis, 75.1% (n=1,744) were male, 81.9% (n=1,896) were Caucasian, and the average age was 38.5 ± 14.8 years. The majority of patients were in the PS group (n=1,573, 67.8%), followed by NTR (n=522, 22.5%), PS/MA (n=188, 8.1%) and MA only (n=38, 1.6%). The majority of patients had an ISS <15 (n=1,710, 73.7%). Compared to the NTR group, PS had a significantly lower risk of mortality (OR 0.50, CI 0.32, 0.80) and significantly longer H-LOS (p=0.0003), however, neither the MA nor the PS/MA group were associated with mortality (OR 0.95, CI 0.23, 3.99 and OR 0.32, CI 0.21, 1.34 for MA and PS/MA, respectively). The MA group had the longest mean I-LOS (3.3 ± 5.4 days) and V-days (2.8 ± 5.3 days), but neither differed significantly from NTR (p=0.11 and p=0.10, respectively). Using ISS< 15 as a reference, higher ISS significantly increased the risk of mortality (ISS 16 to 24: OR 3.04, CI 1.48, 6.28; ISS >25: OR 41.7, CI 25.21, 68.98). The overall in-hospital mortality rate was 5.6% (n=130). Mortality among the four groups was highest in the PS group (n=78, 60.0%), 42 (32.3%) in the NTR group, 7 (5.4%) in the PS/MA group with 3 (2.3%) deaths in the MA group. Each 5-year increase in age was associated with an increased risk of in-hospital mortality across groups (OR 1.1, CI 1.1, 1.2).

CONCLUSION: The results of this study suggest, as compared to NTR group, that methamphetamine use does not significantly increase the risk of in-hospital mortality. While patients who tested positive for drugs other than MA demonstrated lower risk of in-hospital mortality, they also experienced the longest H-LOS, I-LOS and V-days compared to the NTR group. Increased age and ISS were associated with increased odds of mortality.
62. PEDIATRIC TRAUMA PATIENTS; BENEFITS FROM FREE STANDING PEDIATRIC HOSPITALS WITH TRAUMA CENTERS
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BACKGROUND: Differences in the care of pediatric trauma patients at combined adult and pediatric trauma centers versus stand-alone pediatric trauma centers remains unclear with regard to complications and outcomes. While pediatric trauma centers are becoming more common, only 36% of states have designated pediatric trauma centers and less than 24% are Level 1 status. The goal of this study is to compare the treatment of pediatric trauma patients at a tertiary level I trauma center before and after the institution of a free-standing pediatric trauma center with level 2 status.

METHODS: This is a retrospective review, from 2008 to 2014, comparing the outcomes and management of pediatric trauma patients at our ACS-verified Level 1 adult/pediatric trauma center and ACS-verified Level 2 free standing pediatric trauma center. Descriptive statistics were calculated for all variables of interest in the data set. Chi square test is used to compare the distribution of categorical variables between the two hospitals. The Kruskal-Wallis test is used to compare the distribution of numeric variables between the two hospitals.

RESULTS: A total of 2,823 patients were evaluated between 2008-2014, with 1630 at the Level 1 center and 1193 patients at the Level 2 center. Median ISS was higher at adult trauma center hospital, with a median score of 9 vs 4 (p=0.0017). Eighty nine percent of patients evaluated had GCS of 15, with no significant difference noted between the two institutions. Length of emergency room stay was significantly shorter at the pediatric hospital (p=0.0017), however, total length of stay was longer at the pediatric hospital (p=0.0108). The pediatric trauma center volume was made up of more transfers (72% vs 60%, (p=0.0017)). Complication rates were similar between the two institutions - 2.02% at the adult trauma center versus 3.64% at the pediatric trauma center(p=0.0515).

CONCLUSION: Conclusion: Pediatric trauma patients presenting to a free standing pediatric trauma center had shorter length of stay in the emergency room and lower average ISS, but with overall longer length of stay. Complication rates were similar between the adult and pediatric trauma centers. Based on our data, pediatric trauma centers may have some advantage in terms of process, but outcomes do not appear different.
BACKGROUND: We previously demonstrated that an elevated shock index, pediatric age adjusted (SIPA) accurately identifies severely injured children following blunt trauma. We aimed to determine if SIPA could better identify children with traumatic brain injury (TBI) compared to hypotension alone.

METHODS: We performed subset analysis of those children with TBI among a cohort of patients 4-16 years old admitted following blunt trauma with an injury severity score (ISS) >15 from 1/07-6/13. Ability of hypotension on presentation versus elevated SIPA to predict outcomes were compared. SIPA was defined by maximum normal HR and minimum normal SBP by age. Cutoffs included SI >1.22 (age 4-6), >1.0 (7-12), and >0.9 (13-16).

RESULTS: Hypotension was present in 24/392 (6.1%); elevated SIPA was present in 106/392 (27%). The presence of hypotension alone was associated with a statistically significant (p<0.05) increase in the risk of requiring blood transfusion in the first 24 hours (20% of children requiring transfusion were hypotensive at presentation), need for mechanical ventilation (10%), discharge to rehabilitation (9%) and in hospital mortality (42%). Elevated SIPA alone was associated with a significantly increased risk of requiring blood transfusion in the first 24 hours (53% of children requiring blood transfusion had an elevated SIPA), need for ICU admission (32%), need for mechanical ventilation (40%), discharge to rehabilitation (42%), and in hospital mortality (71%). Elevated SIPA identified a greater percentage of patients with each complication than did hypotension alone.

CONCLUSION: Among blunt injured children with TBI, elevated SIPA identifies the most severely brain injured children at risk for requiring mechanical ventilation, prolonged hospital stay, discharge to rehabilitation, and/or death with greater sensitivity than does the presence of hypotension alone. Severe neurologic injury in children results in an elevated SIPA and may mimic hemorrhagic shock.