#### **Quick Shots Session I**

Quick Shot 1 January 14, 2021 2:15 pm Eastern

# ENOXAPARIN TITRATED BY ANTI-XA LEVELS REDUCES VENOUS THROMBOEMBOLISM IN TRAUMA PATIENTS

Rebecca S Gates, MD, Daniel I. Lollar, MD\*, Bryan R. Collier, DO, FACS\*, Jacob R. Gillen, MD\* Carilion Roanoke Memorial Hospital

Presenter: Rebecca S Gates, MD

**Objectives:** Trauma is a major risk factor for the development of a venous thromboembolism (VTE). After observing higher than expected VTE rates within our center's TQIP data, we instituted a change in our VTE prophylaxis protocol with enoxaparin dosing titrated by anti-Xa levels. We hypothesized that this intervention would lower our VTE rates.

<u>Methods:</u> Trauma patients represented in the TQIP trauma database (male and female patients older than age 18) from March 2015 to April 2020 were examined with regards to VTE chemoprophylaxis regimen and VTE incidence. Two groups of patients were identified based on VTE protocol - enoxaparin 30mg twice daily without routine anti-Xa levels ("pre") versus enoxaparin 40mg twice daily with dose titrated by serial anti-Xa levels ("post"). A comparison of proportions was performed to define statistically significant changes in VTE rate between the two cohorts.

**Results:** There were 1709 patients within the pre group and 1412 patients within the post group. There was a statistically significant difference in mean age (56.3 vs. 57.3, p=0.02) and mean Injury Severity Score (16.2 vs. 17.0, p=0.01) between cohorts, though this was felt to be clinically insignificant. There was no difference in sex or mechanism of injury between cohorts. There was a statistically significant reduction in VTE rate (1.81% vs 0.85%, p=0.02) after implementation of the anti-Xa titrated protocol. Risk-adjusted TQIP data showed an improvement in rate of pulmonary embolism from 5th decile to 1st decile.

**Conclusions:** A protocol titrating prophylactic enoxaparin dosing based on anti-Xa levels reduced VTE rates, demonstrating that initiating chemoprophylaxis is only a starting point for VTE prevention. Implementation of this type of protocol requires diligence from the physician and pharmacist team. Further research will investigate the impact of protocol compliance on incidence of VTE.

#### Protocol for Dosing Enoxaparin Based on Anti-Xa Levels

<u>Prophylaxis</u>: Goal anti-Xa level for prophylaxis is 0.2-0.5 units/mL. All trauma patients admitted to the hospital should have anti Xa levels monitored. The first level should be obtained four hours after the third dose.

| Patient population          | Patient population Initial Enoxaparin Dose |                     |
|-----------------------------|--|---------------------|
| Normal renal function       | Enoxaparin 40mg SQ BID                     | 4hrs after 3rd dose |
| CrCl <30 ml/min or dialysis | Heparin 5000 units SQ TID                  | n/a                 |

#### DVT prophylaxis dose adjustment table

| Anti Xa level | Hold next dose     | Dose change      | Next anti Xa level | Monitoring                         |
|---------------|--------------------|------------------|--------------------|------------------------------------|
| <0.2          | No                 | Increase by 10mg | 4hr after 3rd dose | Weekly once<br>anti Xa level       |
| 0.2-0.49      | No                 | No change        | Weekly             | within range of<br>0.2 -0.5 units/ |
| 0.5-1.5       | No                 | Decrease by 10mg | 4hr after 3rd dose | mL                                 |
| 1.51-2.0      | 3 hours            | Decrease by 10mg | 4hr after 3rd dose |                                    |
| >2.01         | Until anti Xa <0.5 | Decrease by 20mg | Every 12 hours     |                                    |

#### Enoxaparin dosing protocol

|                | Pre (n = 1709) | Post (n = 1412) | P-value |
|----------------|----------------|-----------------|---------|
| Demographics   |                |                 |         |
| Mean Age (yrs) | 56.3           | 57.3            | 0.02*   |
| % Male         | 64.7%          | 64.3%           | 0.82    |
| % Female       | 35.3%          | 35.7%           | 0.82    |
| % Blunt        | 91.6%          | 90.7%           | 0.33    |
| % Penetrating  | 8.3%           | 9.3%            | 0.33    |
| Mean ISS       | 16.2           | 17.0            | 0.01*   |
| VTE Rates      |                |                 |         |
| Total VTE      | 1.81%          | 0.85%           | 0.02*   |
| DVT            | 1.35%          | 0.71%           | 0.08    |
| PE             | 0.47%          | 0.14%           | 0.10    |

\* = statistically significant, with p < 0.05

Demographics and VTE rates in "pre" and "post" groups

#### **Quick Shots Session I**

Quick Shot 2 January 14, 2021 2:21 pm Eastern

# LACTATE AS A MEDIATOR OF PREHOSPITAL PLASMA MORTALITY REDUCTION IN HEMORRHAGIC SHOCK

Stephen P Canton, MS, Waseem Lutfi, BS, Jason L. Sperry, MD, MPH\*, Brian J. Daley, MD, MBA\*, Richard S. Miller, MD\*, Brian G. Harbrecht, MD\*, Jeffrey A. Claridge, MD, MS, FACS\*, Adin Tyler Putnam, MD, FACS, FCCM\*, Therese M. Duane, MD, MBA, CPE, FACS, FCCM\*, Herb A. Phelan III, MD, FACS\*, Joshua B Brown, MD, MSc\* University of Pittsburgh Medical Center

#### Presenter: Stephen P. Canton, MS

**Objectives:** Prehospital plasma transfusion in trauma reduces mortality. However, the underlying mechanism remains unclear. Reduction in shock severity may play a role. Lactate correlates with physiologic shock severity and mortality after injury. Our objective was to determine if prehospital plasma reduces lactate, and if this contributes to the mortality benefit of plasma.

<u>Methods:</u> Patients in the PAMPer trial in the upper quartile of injury severity (ISS>30) were included to capture severe shock. Trial patients were randomized to prehospital plasma or standard care resuscitation (crystalloid +/- PRBC). Regression determined the associations between admission lactate, 30-day mortality, and plasma while adjusting for prehospital crystalloid, time, mechanism, and injury characteristics. Causal mediation analysis determined what proportion of the effect of plasma on mortality is mediated by lactate reduction (Fig).

**<u>Results:</u>** 125 patients were included (Table). The plasma group had a lower adjusted admission lactate than standard of care group (coeff -1.54; 95%CI -2.90, -0.19, p=0.03). Plasma was associated with lower odds of 30-day mortality (OR 0.27; 95%CI 0.08-0.90, p=0.03). When adding lactate to this model, the effect of plasma on 30-day mortality was no longer significant (OR 0.36; 95%CI 0.07-1.88, p=0.23), while lactate was associated with mortality (OR 1.47 per 1mmol/L increase; 95%CI 1.08-1.99, p=0.01). Causal mediation demonstrated 36.9% of the total effect of plasma on 30-day mortality was mediated by the reduction in lactate among plasma patients.

**Conclusions:** Prehospital plasma reduces 30-day mortality and lactate in severely injured patients. Over one-third of the effect of plasma on mortality is mediated by a reduction in lactate. Thus, reducing the severity of hemorrhagic shock appears to be one mechanism of prehospital plasma benefit. Further study should elucidate other mechanisms and if a dose response exists.



Causal mediation model of the relationship between plasma and 30-day mortality by the effect of lactate as a surrogate for ameliorating hemorrhagic shock.

| Table 1. Patient Characteristics (ISS > 30)              |                                 |                          |  |  |
|--|---------------------------------|--------------------------|--|--|
| Variable   | Standard-care<br>group (N = 62) | Plasma Group<br>(N = 63) |  |  |
| Median age (IQR) – yr                                    | 41 (25-60)                      | 37 (27-52)               |  |  |
| Males sex – no. (%)                                      | 50 (81.7)                       | 40 (63.5)                |  |  |
| Race – no. (%)   |                                 |                          |  |  |
| White  | 49 (79.0)                       | 57 (90.5)                |  |  |
| Black  | 7 (11.3)                        | 4 (6.4)                  |  |  |
| Other  | 4 (6.5)                         | 0 (0)                    |  |  |
| Unknown  | 2 (3.2)                         | 2 (3.2)                  |  |  |
| Any injury caused by blunt trauma – no. (%)              | 60 (96.8)                       | 57 (90.5)                |  |  |
| Any injury caused by penetrating trauma – no. (%)        | 2 (3.23)                        | 6 (9.5)                  |  |  |
| Median prehospital systolic blood pressure (IQR) – mm Hg | 67 (60-79)                      | 72 (61-84)               |  |  |
| Median prehospital heart rate (IQR) – beats/min          | 120 (99-129)                    | 120 (109-133)            |  |  |
| Lactate (IQR) – mmol/L                                   | 4.3 (2.8-7.0)                   | 3.9 (2.4-6.2)            |  |  |
| 30-day mortality, alive – no. (%)                        | 27 (43.6)                       | 38 (61.3)                |  |  |

#### Quick Shots Session I

Quick Shot 3 January 14, 2021 2:27 pm Eastern

### NEVER-FROZEN LIQUID PLASMA TRANSFUSION IN CIVILIAN TRAUMA: A NATIONWIDE PROPENSITY-MATCHED ANALYSIS

Mohamad Chehab, MD, Lourdes Castanon, MD\*, Letitia Bible, MD\*, Samer Asmar, MD, Michael Ditillo, DO, FACS\*, Muhammad Khurrum, MD, Narong Kulvatunyou, MD\*, Andrew L. Tang, MD\*, Bellal Joseph, MD, FACS\* The University of Arizona

Presenter: Mohamad Chehab, MD

**Objectives:** Never-frozen liquid plasma (LQP) was found to reduce component waste, decrease healthcare expenses, and have a superior hemostatic profile compared to fresh frozen plasma (FFP). Although transfusing LQP in hemorrhaging patients has become more common, its clinical effectiveness remains to be explored. This study aims to examine outcomes of trauma patients transfused with LQP compared to thawed FFP.

<u>Methods:</u> Adult (≥18 years) trauma patients who required transfusion within 4 hours of presentation were identified in the Trauma Quality Improvement Program 2017. Patients were stratified into those receiving LQP vs. FFP. Propensity-score matching in a 1:2 ratio was performed based on patients' age, sex, initial vital signs, injury characteristics, other blood components, and hemorrhage control surgery. Primary outcome measure was mortality. Secondary outcome measures were major complications and hospital length of stay (LOS).

**Results:** A total of 107 adult trauma patients receiving LQP across 26 trauma centers were matched to 214 patients receiving FFP. Mean age was 48±19 years, 73% were male, and median ISS was 27 [24-41]. A total of 42% of patients were in shock, 22% had penetrating injuries, and 31% required surgical intervention for hemorrhage control. Patients received a median of 4 [2,6] units of PRBC, 2 [1,2] units of LQP or FFP, and 1 [0,1] unit of platelets. Rates of 24-hour mortality (2.8 vs. 3.3%; p=0.793) and inhospital mortality (16.8 vs. 18.2%; p=0.765) were comparable in the LQP and FFP groups, respectively. Similarly, no difference in rate of major complications (16.8 vs. 24.8%; p=0.107) and hospital LOS (13 [6-21] vs. 13 [7-23] days; p=0.605) was detected.

**Conclusions:** LQP is safe and effective in resuscitating hemorrhagic trauma patients. LQP has the potential to expand our transfusion armamentarium given its longer storage time and immediate availability.

Quick Shot 4 January 14, 2021 2:33 pm Eastern

#### PREPERITONEAL PACKING FOR PELVIC HEMORRHAGE IS ASSOCIATED WITH INCREASED RISK OF VENOUS THROMBOEMBOLIC COMPLICATIONS: A PROPENSITY SCORE MATCHING ANALYSIS

Leon Naar, MD, Jonathan Parks, MD\*, Inge A.M. van Erp, BSc, Sarah Mikdad, BSc, Jason Fawley, MD, April E. Mendoza, MD, MPH\*, Noelle Saillant, MD\*, Peter J. Fagenholz, MD, David King, MD\*, Haytham Kaafarani, MD, MPH\*, George Velmahos, MD, PhD, MSEd Massachusetts General Hospital

Presenter: Leon Naar, MD

**<u>Objectives</u>**: Preperitoneal packing (PPP) is often used for control of severe pelvic hemorrhage in blunt trauma. We hypothesized that PPP leads to increased incidence of deep vein thrombosis (DVT) and pulmonary embolism (PE) due to mechanical compression of iliac veins.

<u>Methods:</u> We performed a retrospective cohort analysis of blunt trauma patients with severe pelvic fractures (Abbreviated Injury Scale  $\geq$  4) using the 2015-2017 ACS-TQIP database. Patients that arrived deceased, expired in the emergency department, underwent surgery for PPP later than 4 hours after arrival, and all transfer patients were excluded. Patients that underwent PPP within 4 hours of admission were matched to patients that did not undergo PPP using propensity score matching (PSM). Matching was performed based on demographics, comorbidities, injury- and resuscitation-related parameters, vital signs at presentation, as well as initiation of prophylactic anticoagulation. The rates of death, end-organ failure, DVT, and PE during index hospitalization were compared between the matched groups.

**<u>Results:</u>** Out of 5,129 patients with severe pelvic fractures, 158 (3.1%) underwent PPP within 4 hours. After PSM, 314 patients were included in the analysis; PSM results are shown in **Figure 1**. The 2 groups were similar in mortality and end-organ failure. However, PPP patients were significantly more likely to develop DVT (12.7% vs. 5.1%, p=0.028) and PE (5.7% vs. 0.0%, p=0.003) (**Figure 2**).

**Conclusions:** While PPP is often effective in controlling hemorrhage in severe pelvic fractures, it might be associated with higher rates of both DVT and PE and should always be followed by a high index of suspicion. Increased pelvic pressure, direct venous compression and obstruction from packing, and the resulting stasis in the lower extremities may explain these findings.

|  | No PPP (n=157)  | PPP (n=157)     | p-value |
|--|-----------------|-----------------|---------|
| Age (years), mean ± SD                         | 42 ± 19         | $44 \pm 18$     | 0.39    |
| Sex (female), n (%)                            | 50 (31.8)       | 45 (28.7)       | 0.62    |
| Hx of alcoholism, n (%)                        | 8 (5.1)         | 8 (5.1)         | 1       |
| Hx of cirrhosis, n (%)                         | 3 (1.9)         | 3 (1.9)         | 1       |
| Hx of COPD, n (%)                              | 0 (0.0)         | 0 (0.0)         | N/a     |
| Hx of CVA, n (%)                               | 1 (0.6)         | 1 (0.6)         | 1       |
| Hx of DM, n (%)                                | 8 (5.1)         | 11 (7.0)        | 0.64    |
| Hx of disseminated cancer, n (%)               | 0 (0.0)         | 0 (0.0)         | N/a     |
| Hx of CHF, n (%)                               | 0 (0.0)         | 0 (0.0)         | N/a     |
| Hx of hypertension, n (%)                      | 16 (10.2)       | 20 (12.7)       | 0.6     |
| Hx of MI, n (%)                                | 0 (0.0)         | 0 (0.0)         | N/a     |
| Hx of PAD, n (%)                               | 0 (0.0)         | 0 (0.0)         | N/a     |
| Hx of CKD, n (%)                               | 0 (0.0)         | 1 (0.6)         | 1       |
| Hx of substance use, n (%)                     | 5 (3.2)         | 5 (3.2)         | 1       |
| Hx of bleeding disorder, n (%)                 | 3 (1.9)         | 4 (2.5)         | 1       |
| Steroid use, n (%)                             | 0 (0.0)         | 0 (0.0)         | N/a     |
| Smoking (former/current), n (%)                | 14 (8.9)        | 21 (13.4)       | 0.28    |
| ED pulse > 100 bpm, n (%)                      | 103 (65.6)      | 102 (65.0)      | 1       |
| ED SBP < 90 mmHg, n (%)                        | 57 (36.3)       | 50 (31.8)       | 0.48    |
| Shock index, mean ± SD                         | $1.16 \pm 0.49$ | $1.14 \pm 0.53$ | 0.82    |
| ED GCS $\leq 8$ , n (%)                        | 78 (49.7)       | 65 (41.4)       | 0.17    |
| ISS, mean $\pm$ SD                             | 47 ± 13         | $45 \pm 13$     | 0.22    |
| AIS head >3, n (%)                             | 36 (22.9)       | 33 (21.0)       | 0.79    |
| Spinal cord injury, n (%)                      | 5 (3.2)         | 8 (5.1)         | 0.57    |
| AIS thorax >3, n (%)                           | 42 (26.8)       | 42 (26.8)       | 1       |
| Liver injury, n (%)                            | 52 (33.1)       | 49 (31.2)       | 0.81    |
| Splenic injury, n (%)                          | 51 (32.5)       | 44 (28.0)       | 0.46    |
| Kidney injury, n (%)                           | 32 (20.4)       | 30 (19.1)       | 0.89    |
| LE fracture, n (%)                             | 81 (51.6)       | 68 (43.3)       | 0.17    |
| Femur fracture, n (%)                          | 45 (28.7)       | 42 (26.8)       | 0.8     |
| Tibial fracture, n (%)                         | 42 (26.8)       | 42 (26.8)       | 1       |
| Fibular fracture, n (%)                        | 35 (22.3)       | 41 (26.1)       | 0.51    |
| Pelvic fractures                               | 157 (100.0)     | 157 (100.0)     |         |
| Pelvic arch incomplete fracture, n(%)          | 74 (47.1)       | 77 (49.0)       | 0.82    |
| Pelvic arch complete fracture, n (%)           | 83 (52.9)       | 80 (51.0)       | 0.82    |
| Acetabular fracture, n (%)                     | 66 (42.0)       | 52 (33.1)       | 0.13    |
| RBC units transfused within 4 hours, mean ± SD | $12 \pm 13$     | $14 \pm 13$     | 0.15    |
| VTE thromboprophylaxis within 48 hours, n (%)  | 33 (21.0)       | 37 (23.6)       | 0.68    |

**Figure 1:** Comparison between patients with severe pelvic fractures that had preperitoneal packing within 4 hours of admission and those who did not undergo preperitoneal packing, after propensity score matching.



**Figure 2:** Bar graph showing the different rates of deep venous thrombosis and pulmonary embolism between patients with severe pelvic fractures that had preperitoneal packing within 4 hours of admission and those who did not undergo preperitoneal packing, after propensity score matching; the asterisk signifies statistically significant differences (p-value<0.05).

Quick Shot 5 January 14, 2021 2:39 pm Eastern

# FRAIL GERIATRIC PATIENTS WITH ACUTE CALCULOUS CHOLECYSTITIS: OPERATIVE VS. NONOPERATIVE MANAGEMENT?

Samer Asmar, MD, Joseph V. Sakran, MD, MPH, MPA, FACS\*, Letitia Bible, MD\*, Molly J Douglas, MD\*, Michael Ditillo, DO, FACS\*, Lourdes Castanon, MD\*, Mohamad Chehab, MD, Muhammad Khurrum, MD, Narong Kulvatunyou, MD\*, Bellal Joseph, MD, FACS\* The University of Arizona

Presenter: Samer Asmar, MD

**Objectives:** There remains a paucity of data evaluating nonoperative management of acute calculous cholecystitis (ACC) in the frail geriatric population. The aim of our study was to examine long-term outcomes of frail geriatric patients with ACC treated with cholecystectomy compared to initial nonoperative management.

<u>Methods:</u> We conducted a (2017) analysis of the Nationwide Readmissions Database and included frail geriatric (≥65 years) patients with a diagnosis of ACC. Frailty was assessed using the 5-factor modified frailty index (mFI). Patients were stratified into those undergoing cholecystectomy at index admission (OP) vs. those receiving antibiotics only or with percutaneous drainage with no operative intervention (NOP). Primary outcomes were procedure-related complications in the OP group and 6-month failure of NOP (readmission with cholecystitis). Secondary outcomes were mortality and overall hospital length of stay (LOS).

**Results:** A total of 53,412 geriatric patients with ACC were identified, of which 27,263 (51.0%) were frail: 16,791 (61.6%) in OP group and 10,472 (38.4%) in NOP group. Patients were comparable in terms of age (76±7 vs. 77±8 years;p=0.082) and mFI (0.47 vs. 0.48;p=0.132). Rate of procedure-related complications in the OP group was 9.3%, while rate of 6-month failure of NOP was 18.9%. Median time to failure of NOP management was 36[12-78] days. Mortality was significantly higher in the frail NOP group (5.2 vs. 3.2%;p<0.001). Patients in the NOP group had a significantly greater number of hospitalized days (8[4-15] vs. 5[3-10];p<0.001). NOP was independently associated with increased mortality (OR 1.7[1.4-2.0];p<0.001).

**Conclusions:** NOP of frail geriatric patients with ACC was associated with increased mortality. One in five patients failed NOP and subsequently had complicated hospital stays. Early cholecystectomy may offer better outcomes in managing ACC in the frail geriatric population.



Management of Frail Geriatric Patients With Acute Calculous Cholecystitis

Quick Shot 6 January 14, 2021 2:45 pm Eastern

### THE ROLE OF PERIOPERATIVE ANTIBIOTICS: ANALYSIS OF THE EAST MULTICENTER RETAINED COMMON BILE DUCT STONE STUDY

Brett M. Tracy, MD\*, Brett M. Tracy, MD\*, Cameron Paterson, MD, Denise Torres, MD, Katelyn Young, BS, Jonathan M. Saxe, MD\*, Daniel Kinstedt, BS, Martin D. Zielinski, MD, FACS\*, Maraya N. Camazine, BS, D. Dante Yeh, MD, MHPE, FACS, FCCM, FASPEN\*, Rondi Gelbard, MD\*, Emory University School of Medicine

Presenter: Brett M. Tracy, MD

**<u>Objectives</u>**: There is wide variation in perioperative antibiotic (abx) use in choledocholithiasis (CDL) and gallstone pancreatitis (GSP). We sought to determine the effect of prolonged abx treatment on outcomes for CDL or GSP.

<u>Methods</u>: We performed a prospective observational study of patients undergoing same admission cholecystectomy for CDL and GSP between 2016 and 2019 at 12 U.S. centers. Patients with a history of endoscopic retrograde cholangiopancreatography (ERCP) or diagnosis of cholangitis were excluded. Outcomes including infectious and non-infectious complications were compared among patients receiving prophylactic (<24 hours) and prolonged (> 24 hours) abx.

**<u>Results:</u>** There were 917 patients in the cohort; 54% (n=499) received prolonged abx. Patients receiving prolonged abx were older (55.5 vs 46.1 y, p<.001), and more often tachycardic (14% vs 7%, p<.001). On multivariable regression, a gangrenous gallbladder (OR 3.7, 95% CI 1.2-11.9, p=.03), WBC > 13 (OR 2.7, 95% CI 1.7-4.2, p<.001), HR > 100 (OR 2.2, 95% CI 1.2-4.0, p=.01), and CDL [vs GSP] (OR 2.1, 95% CI 1.1-4.1, p=.03) predicted prolonged use. Hospital length of stay was significantly longer (5 vs 3 d, p<.001) in the prolonged group as were rates of non-home discharge (7% vs 2%, p<.001). Infectious complications were similar between groups (0.8% vs 1.9%, p=.14). Patients with acute kidney injury (AKI) received a longer abx course (5 vs 2 d, p=.003). After adjusting for age, gender, operative duration, and preoperative diagnosis, receiving >2 days of postoperative abx predicted AKI (OR 9.0, 95% CI 1.0-80.5, p=.04).

**<u>Conclusions</u>**: Patients with CDL, gangrenous gallbladder, and systemic signs of inflammation are more likely to receive prolonged abx. After correcting for potential selection bias and confounders, we were unable to identify a benefit associated with prolonged abx.

Quick Shot 7 January 14, 2021 2:51 pm Eastern

#### DO SURGICAL EMERGENCIES STAY AT HOME? OBSERVATIONS FROM THE FIRST US COVID EPICENTER

Caroline T Dong, MD, Anna Liveris, MD\*, Erin Lewis, MD, Edward Chao, MD, FACS\*, Smita Mascharak, MD, Srinivas H Reddy, MD\*, Sheldon H. Teperman, MD\*, John McNelis, MD\*, Melvin E. Stone Jr, MD\* Jacobi Medical Center

#### Presenter: Caroline T Dong, MD

**Objectives:** During the COVID-19 pandemic, New York instituted a statewide stay-at-home mandate to lower viral transmission. While the disruption of safety-net healthcare and public fear have been proposed as factors resulting in delays in presentation, public health guidelines advised continued provision of timely surgical care for patients. We hypothesized that admissions for emergency general surgery (EGS) diagnoses would decrease during the pandemic, but that mortality would be unchanged.

<u>Methods:</u> Multicenter observational study comparing EGS admissions from January-May 2020 to 2018 and 2019 across 15 New York City hospitals in the largest public healthcare system in the US. EGS diagnoses were defined using ICD-10 codes and grouped into the 7 most common diagnosis categories: appendicitis, cholecystitis, small/large bowel, peptic ulcer disease, groin hernia, ventral hernia, and necrotizing soft tissue infection. Baseline demographics were compared including age, race/ethnicity, and payor status. Outcomes included COVID status and mortality.

**<u>Results:</u>** 1,376 patients were admitted for EGS diagnoses from January-May 2020, a decrease compared to both 2018 (1,789) and 2019 (1,668) (p <.0001). This drop was most notable after the stay-at-home mandate (March 22, 2020; week 12). The number of incidentally COVID+ EGS patients peaked in April 2020 at 19.2% compared to 3.3% in March and 6.0% in May. Mortality increased in March-May 2020 compared to 2019 (2.2 vs 0.7%); this difference was statistically significant between April 2020 vs April 2019 (4.1 vs 0.9%, p=0.045).

<u>Conclusions</u>: The COVID-19 pandemic and subsequent New York stay-at-home mandate were associated with decreased EGS admissions from March-May 2020 compared to prior years. Contrary to our initial hypothesis, there was a statistically significant increase in EGS patient mortality during this time, which peaked at the height of COVID infection rates in our population.



Figure 1. EGS admissions January-May 2018-2020, rolling 7 day average. EGS admissions in 2020 decreased after the New York stay-at-home mandate on March 22, 2020 (week 12).



Figure 2. Mortality and COVID status in EGS admissions. Mortality (primary y-axis) in EGS patients was increased in 2020 compared to 2019 with peak in April 2020. Percent COVID+ EGS patients (secondary y-axis) from March-May 2020 with peak in April 2020.

Quick Shot 8 January 14, 2021 2:57 pm Eastern

# BENZODIAZIPINES INCREASE THE LIKELIHOOD OF BOTH INFECTIOUS AND THROMBOTIC COMPLICATIONS

Edward Skicki, DO, Eric H. Bradburn, DO, MS, FACS\*, Madison Morgan, BS, Frederick Rogers, MD, MS, FACS\* Penn Medicine Lancaster General Health

Presenter: Edward Skicki, DO

**<u>Objectives</u>**: Benzodiazepines (BZDs) modulate peripheral  $\gamma$ -amino-butyric acid type A on macrophages causing immunomodulation. They inhibit pro-inflammatory cytokines increasing infections. Prior studies have also shown that infections can increase thrombotic complications. We sought to examine this relationship in trauma patients. We hypothesized that the presence of BZDs on admission urine drug screen (UDS) would increase rates of both complications.

**Methods:** All patients submitted to the Pennsylvania Trauma Outcome Study database from 2003-2018 were queried. Those with a positive UDS for BZDs were analyzed. Infectious complications were defined as: pneumonia, UTI, sepsis, wound and soft tissue infection; thrombotic complications were defined as the presence of pulmonary embolism or deep vein thrombosis. Logistic regressions controlling for demographic and injury covariates assessed the adjusted impact of BZDs on infectious and thrombotic complications.

**<u>Results:</u>** 9,394 (1.56%) patients had infectious complications and 8,794 (1.46%) had thrombotic complications. 33,260 (5.52%) patients had a positive UDS for BZDs on admission. Univariate analysis showed that those positive for BZDs had higher rates of infectious (3.33% vs 1.45%, p<0.001) and thrombotic (2.84% vs 1.38%, p<0.001) complications. Multivariate analysis revealed that BZDs significantly increased the odds of infectious and thrombotic complications. Patients who tested positive for BZDs and subsequently developed infection had dramatically increased odds (AOR: 5.17, p<0.001) of developing thrombotic complications.

**Conclusions:** Trauma patients with a positive UDS for BZDs had higher odds of both infectious and thrombotic complications. Moreover, odds of thrombotic complications were higher in those with infections. This supports that BZD use is associated with more infections which may lead to more thrombotic events in trauma.

|  | Infectious Complications<br>(n=9,394) |               | Thrombotic Complications<br>(n=8,794) |          |
|--|---------------------------------------|---------------|---------------------------------------|----------|
|  |                                       |               |                                       |          |
| Variable   | Adjusted Odds<br>Ratio (95% CI)       | p-value       | Adjusted Odds<br>Ratio (95% CI)       | p-value  |
| + UDS for Benzodiazepines                              | 1.41 (1.32-1.51)                      | < 0.001       | 1.24 (1.16-1.33)                      | < 0.001  |
|  | AUI                                   | ROC:0.76      | AU                                    | ROC:0.78 |
| *adjusted for injury severity s<br>gender, injury type | score, systolic blood                 | l pressure, ( | Glasgow coma score,                   | , age,   |

Table 1. Multivariate analysis of infectious and thrombotic complications in the PTOS database

Quick Shot 9 January 14, 2021 3:03 pm Eastern

#### SEVERE TRAUMA AND CHRONIC STRESS LEAD TO CHANGES IN THE INTESTINAL MICROBIOME DOMINATED BY RUMINOCOCCUS AND BACTEROIDES

Lauren Kelly, MD, Chase Thompson, BS, Kolenkode Kannan, PhD, Raad Gharaibeh, PhD, Ryan Thomas, MD, Alicia M. Mohr, MD\* UF Health Shands Hospital

Presenter: Lauren Kelly, MD

**Objectives:** Despite advances in critical care, severe trauma remains a major cause of morbidity and the altered intestinal microbiome may influence outcomes. We hypothesized that rats who underwent severe trauma would experience a change in intestinal microbiota and when chronic stress was induced to mimic the post-trauma events seen during hospitalization, this would provide insight into the failure of some patients to recover during critical illness without the influence of antibiotics and transfusion.

<u>Methods:</u> Male Sprague-Dawley rats aged 8 weeks were randomized (n=6/group) to naïve, lung contusion with hemorrhagic shock (LCHS), and LCHS with chronic stress in a restraint cylinder for 2 hours/day (LCHS/CS). Stool was collected on days 0, 3, and 7 for bacterial whole genome DNA isolation. The V3-V4 hypervariable region was amplified, 16S rRNA gene sequencing performed, and cohorts were compared. Alpha diversity was assessed using Chao1 and Shannon indices using rarefied counts and beta diversity was assessed by principle coordinate analysis (PCoA) between cohorts. False discovery rate correction for cage effect was performed.

**<u>Results:</u>** LCHS demonstrated a significant difference in alpha and beta diversity at day 7 (Fig 1; FDR=0.01 [alpha], <0.01 [beta]) that was dominated by genera *Ruminococcus*. Further taxa analysis revealed a ~10x reduction in genera *Bacteroides* abundance in the LCHS/CS cohort vs LCHS (FDR<0.01) at day 3 and 7. There was no difference in alpha or beta diversity at the intergroup level at day 3 or 7 following LCHS+/-CS.

**Conclusions:** While inter-cohort microbiome changes were not evident based on exposure to LCHS+/-CS, individual genera may be responsible for phenotypic changes in these groups. Further studies of these microbiome alterations with transcriptomic changes are needed to identify bacteria which may be responsible for increased morbidity following severe trauma.



Fig 1. Changes in alpha (A) and beta (B) microbial diversity in rats after trauma

#### Quick Shots Session II

Quick Shot 10 January 14, 2021 2:15 pm Eastern

#### IS MORE BETTER? DO STATEWIDE INCREASES IN TRAUMA CENTERS REDUCE INJURY-RELATED MORTALITY?

Evelyn I Truong, BS, Evelyn I Truong, BS, Vanessa P. Ho, MD, MPH, FACS\*, Colette Ngana, Jacqueline Curtis, PhD, Eric Curfman, BS, Jeffrey A. Claridge, MD, MS, FACS\*, Esther S. Tseng, MD\* MetroHealth Medical Center

#### Presenter: Evelyn I Truong, BS

**Objectives:** Trauma centers (TC) are inconsistently distributed throughout the US. It is unclear if new TC improve access to trauma care and decrease trauma mortality. We theorized that increases in TC would be associated with decreases in injury-related mortality at the state-level.

<u>Methods:</u> We used data from the American Trauma Society to geolocate every state-designated or ACS-verified TC in all 50 states and DC from 2014-2018. These data were merged with publicly available injury-related mortality (IRM) data from the Centers for Disease Control and Prevention. We used geographic information systems methods to map and study the relationships between TC locations and state-level IRM over time. Repeated measures regression analysis, accounting for state-level fixed effects, was used to calculate effect of changes in TC with same-year IRM and 1-year lag IRM; results shown as beta-coefficient (95% CI, p-value).

**<u>Results:</u>** Nationwide between 2014 and 2018, the number of TC increased from 2039 to 2153. There was notable interstate variation, from 1 TC (Rhode Island, Vermont) to 284 TC (Texas). Four patterns in the number of TC growth within states emerged: static (12), increased (29), decreased (5), or variable (4) (Figure 1). Of states with TC increases, 26 (90%) had increased IRM between 2014 and 2017, while the remaining 3 saw a decline. A weakly negative association was seen between the number of trauma centers and IRM overall (Figure 2). Using regression, TC increases were not associated with IRM (same-year 0.06 (-0.10 - 0.22, p=0.4); 1-year lag -0.04 (-0.28 - 0.19, p=0.7).

<u>Conclusions</u>: Adding new trauma centers is not associated with decreases in state-level IRM, suggesting that more trauma centers alone is not the best strategy to reduce IRM. More work should be done to identify the optimal number and location of trauma centers.



Figure 1. Changes in trauma center distribution by state between 2014 and 2017.



Figure 2. Mortality vs number of trauma centers between 2014 and 2017 in states with increased trauma centers

Quick Shot 11 January 14, 2021 2:21 pm Eastern

### POLICE TRANSPORT OF FIREARM-INJURED PATIENTS - MORE OFTEN AND MORE INJURED

Zoë Maher, MD\*, Jessica H Beard, MD, MPH\*, Elizabeth Dauer, MD\*, Madeleine Carroll, MD, Steven Forman, BS, Gena Topper, BS, Abhijit S. Pathak, MD\*, Thomas A. Santora, MD\*, Lars Ola Sjoholm, MD\*, Huaqing Zhou, PhD, Amy J. Goldberg, MD\* Temple University School of Medicine

#### Presenter: Zoë Maher, MD

**Objectives:** Police transport (PT) of penetrating trauma patients decreases the time between injury and trauma center arrival. Our study objective was to characterize trends in the rate of PT and its impact on mortality. We hypothesized that PT is increasing and that these patients are more injured.

<u>Methods</u>: We conducted a single-center, retrospective cohort study of adult ( $\geq$  18 years) patients presenting with gunshot wounds (GSWs) to a Level 1 center from 2012-2018. Patients transported by police or ambulance (EMS) were included. The association between mode of transport (PT vs. EMS) and mortality was evaluated using chi-square, t-tests, Mann-Whitney u tests, and multiple logistic regression.

**<u>Results:</u>** Of 2,007 patients, there were 1,357 PT patients and 650 EMS patients. Overall in-hospital mortality was 23.6%. The rate of GSW patients arriving by PT increased from 48.9 to 67.6% over the study period (p < 0.001). Compared to EMS patients, PT patients were sicker on presentation with lower initial SBP (98 vs. 110, p < 0.001), higher ISS (median [IQR], 10 [2-75] vs 9 [1-17], p < 0.001) and more bullet wounds (3.5 vs. 2.9, p < 0.001). PT patients more frequently underwent resuscitative thoracotomy (19.2% vs 10.0%, p < 0.001) and immediate surgical exploration (31.3% vs. 22.6%, p < 0.001). When excluding patients arriving in cardiac arrest, there was no difference in adjusted in-hospital mortality between transport groups. Of patients surviving to discharge, PT patients trended toward higher ISS (9.6 vs. 8.3, p=0.068) and had lower SBP on arrival (126 vs. 130, p=0.002) than EMS patients.

**Conclusions:** Police transport of GSW patients is increasing at our Level 1 center. Compared to EMS patients, PT patients are more severely injured and, excluding patients arriving in cardiac arrest, have similar in-hospital mortality. Further study is necessary to understand the impact of PT on outcomes in specific subsets in penetrating trauma patients.

#### **Quick Shots Session II**

Quick Shot 12 January 14, 2021 2:27 pm Eastern

#### **GEOSPATIAL ASSESSMENT OF AIR MEDICAL OVERTRIAGE**

Andrew-Paul Deeb, MD, Heather Phelos, MPH, Andrew B. Peitzman, MD\*, Timothy Billiar, MD, Joshua B Brown, MD, MSc\* University of Pittsburgh Medical Center

Presenter: Andrew-Paul Deeb, MD

**Objectives:** Despite evidence of benefit after injury, air medical transport (AMT) overtriage (OT) remains high. Efforts to reduce OT are crucial given the risks and significant cost of AMT. Scene and transfer OT are distinct, as decisions are made by EMS and referring physicians respectively. It is unclear if OT is associated with specific geographic patterns or patient characteristics. Our objective was to identify geographic hot spots and patient-level predictors of OT for scene and interfacility AMT.

**Methods:** Patients age>15 undergoing scene or interfacility AMT in PTOS were included. OT was defined as discharge within 24hr of arrival. Patients were mapped to population weighted zip code centroid and rates of OT per 100 AMT patients transported were calculated. Hot spot analysis was performed to identify regions of high and low OT rates across the state. Logistic regression determined patient characteristics associated with OT. All analyses were performed for scene and transfer patients separately.

**<u>Results:</u>** 85,572 patients were included (37.4% transfers). OT was more common in transfer (11.8%) versus scene (5.5%) AMT (p<0.01). Hot spot analysis of scene AMT showed high OT rates in central and northeast regions (Fig 1), while high OT rates for transfers were in the southwest (Fig 2). Some areas had low scene but high transfer OT rates and vice versa. For scene patients, OT was associated with distance (OR 1.03; 95%CI 1.01-1.06 per 10mi, p=0.04), neck injury (OR 1.27; 95%CI 1.01-1.60, p=0.04), and single system injury (OR 1.37; 95%1.15-1.64, p<0.01). For transfer patients, OT was associated with rural area (OR 1.64; 95%CI 1.22-2.21, p<0.01), facial injury (OR 1.22;95%CI 1.03-1.44, p=0.02), and single system injury (OR 1.35; 95%CI 1.18-2.19, p<0.01).

<u>Conclusions</u>: Geographic OT rates vary significantly for scene and transfer AMT. Coupled with unique patient profiles these findings can target areas for individualized process improvement initiatives to reduce AMT OT.



Geospatial hot spot analysis of air medical overtriage rates among patients transported from the scene of injury. Red indicates significantly higher than average rates; blue indicates significantly lower than average rates. Black asterisk are helicopter EMS bases, White on blue hospital symbols are level 1 or 2 trauma centers, Blue on white hospital symbols are level 3 or 4 trauma centers.



Geospatial hot spot analysis of air medical overtriage rates among patients transferred from a referring hospital. Red indicates significantly higher than average rates; blue indicates significantly lower than average rates. Black asterisk are helicopter EMS bases, White on blue hospital symbols are level 1 or 2 trauma centers, Blue on white hospital symbols are level 3 or 4 trauma centers.

Quick Shot 13 January 14, 2021 2:33 pm Eastern

#### RACIAL DISPARITIES IN TRIAGE OF ADOLESCENT PATIENTS AFTER BULLET INJURY

Erin G Andrade, MD MPH\*, Emily J Onufer, MD, MPH, Melissa Thornton, MD, Martin Keller, MD\*, Douglas J.E. Schuerer, MD, FACS\*, Laurie J. Punch, MD, FACS\* Washington University in Saint Louis

Presenter: Erin G Andrade, MD MPH

**<u>Objectives</u>**: The optimal care environment for traumatically injured adolescents remains controversial. We hypothesized that race influences whether adolescents are treated at pediatric trauma centers (PTCs) versus adult trauma centers (ATCs) after bullet injury.

**Methods:** Two institutional trauma databases from an American College of Surgeons verified level one PTC and ATC located next to each other in an urban center were queried for gunshot wounds in adolescent patients (15-18 years old) from 2015 to 2017. PTCs and ATCs were compared in terms of patient demographics, services offered, and clinical outcomes. Results were analyzed using univariate analysis and logistic regression.

**<u>Results:</u>** Of 315 patients meeting inclusion criteria, 183 were treated in an ATC versus 132 in a PTC. Patients at PTCs were significantly more likely to be younger (16.1 vs 17.5 years old, p<0.01), Caucasian (16% vs 5%, p<0.01) and privately insured (41% vs 30%, p<0.01). Stratified by age, the proportion of Caucasians treated at PTCs exceeded the proportion of African Americans treated at PTCs (Figure 1). Following treatment in a PTC emergency room, patients are more likely to be admitted (58% vs 46%, p=0.04), to receive inpatient (94% vs 28%, p<0.01) and outpatient social work follow-up (89% vs 1%, p<0.01), and less likely to return to the emergency department within 30 days (21% vs 8%, p<0.01). No significant difference in mortality existed. On multivariate logistic regression, African American adolescents were significantly less likely to be treated at a PTC (OR=0.28, 95% CI 0.10, 0.80, p=0.02) after controlling for age and insurance status.

**Conclusions:** Race served as a significant factor in triage of adolescent trauma patients to ATC in this study. Patients at ATCs received less social work follow up and had increased emergency room utilization following treatment of bullet injury, potentially contributing to racial disparity in outcome.



Proportion of Gunshot Wounds Treated at Pediatric Trauma Centers out of all Adolescent Gunshot Wounds Triaged Stratified by Race and Age

| Variable         | Odds Ratio | 95% Confidence Interval | p-value |
|------------------|------------|-------------------------|---------|
| African-American | 0.28       | 0.10, 0.80              | 0.02    |
| Age, years       | 0.13       | 0.08, 0.21              | <0.01   |
| Uninsured        | 0.35       | 0.15, 0.82              | 0.82    |

Logistic Regression: Impact of Race, Age, and Insurance Status on the Treatment of Adolescent Gunshot Wounds at a Pediatric Trauma Center Quick Shot 14 January 14, 2021 2:39 pm Eastern

#### COMPARING FATAL CHILD ABUSE INVOLVING BIOLOGICAL AND SURROGATE PARENTS

Maxwell J Presser, Hallie Quiroz, MD, Eduardo Perez, MD, Juan Sola, MD, Nicholas Namias, MBA, MD\*, Chad Thorson, MD, MSPH University of Miami Miller School of Medicine

#### Presenter: Maxwell J. Presser

**Objectives:** Nearly half of pediatric homicides under age 5 are attributable to child abuse. Parents are most commonly the perpetrators, but less is known about incidents involving biological vs. surrogate parents. We seek to evaluate the characteristics of fatal child abuse involving biological and surrogate parents using the [STATE] National Violent Death Reporting System (NVDRS).

<u>Methods</u>: This database was used to examine all homicides of children under age 18 from 2011-2017. Demographic and incident characteristics were analyzed using existing NVDRS variables and incident narratives. Chi-squared and nonparametric tests were used to compare fatal child abuse incidents involving biological and surrogate parents (e.g., adoptive, foster, step-parents, intimate partners of biological parent).

**Results:** There were 452 pediatric homicides and 219 cases of fatal child abuse. Of all cases of fatal child abuse, 60% involved biological and 29% involved surrogate parents. Compared to children killed by biological parents, children killed by surrogate parents were older (4.0 vs. 3.1 year old, p<0.05), more often male (71% vs. 51%, p<0.05), more likely to survive the initial injury and present to the emergency department prior to death (96% vs. 69%, p<0.05), and less likely to have a medical comorbidity (2% vs 11%, p<0.05). Surrogate parents were more likely to be male (90% vs. 48%) and use a firearm (20% vs. 13%, p<0.05) to inflict the injury. The race/ethnicity of the child was not associated with the relationship of the parent.

**Conclusions:** Pediatric homicide by biological parents occurs more frequently, but surrogate perpetrators are almost exclusively male and more likely to use firearms. Most children survive the initial injury and present to the emergency department prior to death, leaving an opportunity to intervene on potentially preventable deaths if abuse is identified in a timely fashion.

#### Quick Shots Session II

Quick Shot 15 January 14, 2021 2:45 pm Eastern

# DRIVER'S EDGE: AN OUTCOME EVALUATION OF A YOUNG DRIVER ADVANCED TRAINING PROGRAM

Laura Gryder, MA, Samantha A Slinkard, MPH, Deborah A. Kuhls, MD\* University of Nevada Las Vegas School of Medicine

#### Presenter: Laura Gryder, MA

**Objectives:** Young drivers (YD; 15-20 years) are disproportionately injured and killed in motor vehicle crashes throughout the US. Driver's Edge (DE) is an advanced driver training program for YD that aims to reduce YD traffic injuries and fatalities in NV through hands-on training with professional drivers. The program curriculum covers YD risk factors and crash facts, emergency maneuvers to avoid a collision, and basic car maintenance for safe driving. The purpose of this outcome evaluation was to determine if the DE program was achieving its stated objectives to improve safe driving behaviors in their YD participants and to measure the program's effectiveness, efficiency, and value to participants.

<u>Methods</u>: The evaluation team was provided with a retrospective database of pre- and post-test responses from YD participants, questionnaire responses from parent participants, and 1 year follow-up survey responses from young drivers and parents for events held in 2018 and 2019. The pre-/post-tests measured changes in safe driving knowledge, attitudes, and behaviors. Quantitative statistical (descriptives and Pearson's Chi-square; significance set at p=.05) and qualitative content analyses were conducted.

**<u>Results</u>**: Responses from YD participants (n=649), parent participants (n=683), and 1 year follow-up survey responses from YD (n=86) and parents (n=195) were provided for analysis. Aggregate YD participant knowledge of safe driving behaviors increased from a mean of 39% (pre-test) to 77% (post-test). 1 year follow-up demonstrated YD participants felt DE helped them avoid a collision (91.9%), and became a safer, more aware driver (mean score of 4.62/5.00).

<u>Conclusions</u>: DE YD participants improved knowledge of safe driving behaviors, which resulted in selfassessed safer driving behavior at one year follow-up.

Table 1. Comparison of Results of YD Pre-/Post-tests

| Selected Driver Knowledge<br>Question Topics            | Pre-test Score<br>(% of students<br>selecting<br>correct answer<br>only) | Post-test Score<br>(% of students<br>selecting<br>correct answer<br>only) | X² (p-value)     |
|---|--|---|------------------|
| Knowledge of contact patches of tires of passenger cars | 61.9%  | 98.3%   | 23.1 (p=.001)    |
| Threshold braking                                       | 6.3%   | 56.7%   | 122.328 (p<.001) |
| Regaining control after a skid                          | 45.6%  | 79.8%   | 42.878 (p<.001)  |
| Drunk driver fatal crash statistics                     | 68.7%  | 87.5%   | 44.148 (p<.001)  |
| What is understeering?                                  | 23.3%  | 63.0%   | 65.336 (p<.001)  |
| What is oversteering?                                   | 18.8%  | 66.3%   | 57.486 (p<.001)  |
| Object avoidance - proper<br>maneuvers                  | 47.5%  | 82.1%   | 31.176 (p<.001)  |
| Stopping distance                                       | 32.2%  | 68.3%   | 88.125 (p<.001)  |

Table 1. comparison of Results of YD Pre-/Post-tests

Quick Shot 16 January 14, 2021 2:51 pm Eastern

#### EFFECT OF INJURY LOCATION AND SEVERITY ON OPIOID USE AFTER TRAUMA

Craig Brown, MD, MSc, Rachel Baker, MD, John Montgomery, MD, MSc, Charles Mouch, MD, Brooke Kenney, MPH, Michael Englesbe, MD, Jennifer Waljee, MD, MPH, MSc, Mark R. Hemmila, MD\* University of Michigan

Presenter: Craig Brown, MD, MSc

**Objectives:** Recent data have suggested that persistent opioid use is prevalent following trauma. The effect of type of injury and total injury burden is not known. We sought to characterize the relationship between injury location and severity and risk of new persistent opioid use (NPOU).

<u>Methods:</u> We investigated post-discharge opioid utilization among patients who were admitted for trauma between January 2010-June 2017 using the Optum Clinformatics<sup>™</sup> Database. NPOU was defined as one of the following scenarios: 1) Two separate opioid prescription fills between 0-14 days post-discharge and having 1+ fills in the 91-180 days following discharge or 2) Filling a prescription in the 15-90 days following discharge in addition to a filling in the 91-180 day post-discharge period. Multivariable logistic regression was used to assess the relationship between injury type and severity with new persistent opioid use development.

**<u>Results</u>**: A total of 26,437 opioid-naïve patients were included in the analysis. Overall, 2,277 (8.6%) patients met the criteria for NPOU. After adjustment for confounding, NPOU was significantly more common for patients with injury to the extremities (aOR 1.75, 95% CI 1.57-1.94) or abdomen (aOR 1.42, 95% CI 1.22-1.64). Importantly, patients with maximum AIS  $\geq$  2 for any body region had 1.49 fold odds of NPOU compared to patients with score of 1 (95% CI 1.28-1.73), while no difference was seen across groupings of total injury burden based on Injury Severity Score.

**Conclusions:** NPOU is common among patients suffering from trauma. Additionally, patients suffering from extremity and abdominal injuries are at highest risk. Maximum individual region injury severity predicts development of new persistent use whereas total injury severity does not.

#### Proportion of Patients Within Each Body Region with New Persistent Opioid Use



Heatmap Detailing Proportion of Patients within Each Injury Location and Severity Score Category with New Persistent Opioid Use. AIS = Abbreviated Injury Scale

Quick Shot 17 January 14, 2021 2:57 pm Eastern

#### DEXMEDETOMIDINE AND PARALYTIC EXPOSURE AFTER DAMAGE CONTROL LAPAROTOMY: RISK FACTORS FOR DELIRIUM? RESULTS FROM THE EAST SLEEP-TIME MULTICENTER TRIAL

Cassandra Krause, MD, MA, Eugenia Kwon, MD, Kaitlin McArthur, BS, Xian Luo-Owen, MD PhD, Meghan Cochran-Yu, MD, Lourdes Swentek, MD\*, Sigrid Burruss, MD FACS, David Turay, MD, PhD\*, Chloe Krasnoff, BS, Areg Grigorian, MD, Jeffry Nahmias, MD, MHPE, FACS\*, Ahsan Butt, BS, Adam Gutierrez, MD, Aimee LaRiccia, DO\*, Michelle Kincaid, MD\*, Michele N Fiorentino, MD, Nina E Glass, MD\*, Samantha Toscano, BS, Eric Ley, MD, Sarah R Lombardo, MD, MSc\*, Oscar D. Guillamondegui, MD, MPH\*, James M. Bardes, MD\*, Connie DeLa'O, MD\*, Salina M. Wydo, MD\*, Kyle Leneweaver, DO\*, Nicholas T Duletzke, M.D., Jade Nunez, MD\*, Simon Moradian, MD, Joseph Posluszny, MD\*, Leon Naar, MD, Haytham Kaafarani, MD, MPH\*, Heidi Kemmer, DO, Mark J. Lieser, MD\*, Alexa Dorricott, MD, Grace Chang, MD\*, Zoltan Nemeth, MD PhD Loma Linda University Medical Center

#### Presenter: Cassandra Krause, MD, MA

**Objectives:** The use of deep sedation and chemical paralysis has been noted to be associated with increased incidence of delirium. There is limited data on the effects of sedation on patients after a damage control laparotomy (DCL). Therefore we sought to evaluate factors associated with ICU delirium in patients who underwent DCL.

<u>Methods:</u> We reviewed retrospective data from 15 centers in the EAST SLEEP-TIME registry, including age, Charlson Comorbidity Index (CCI), total 24-hour fluid balance, number of takebacks after DCL, duration of paralytic infusion, duration and type of sedative and opioid infusions as well as daily CAM-ICU and RASS scores to analyze risk factors associated with proportion of delirium-free/coma-free ICU days during the first 30 days (DF/CF-ICU-30) using multivariate linear regression.

**Results:** 181 patients (59% trauma) from the overall 567-patient cohort had complete delirium data. Mean age was 47.5±18.6 yrs, mean CCI was 2.8±3.5 and mean number of take backs was 1.5±1.2. Mean DF/CF-ICU-30 was 63.5±35.5%. The mean duration of propofol was 56.2±75.4 hrs while for dexmedetomidine it was 16.9±41.8 hrs. Mean durations of opioid and benzodiazepine infusions were 93.7±122 hrs and 13.6±52.4 hrs respectively and mean duration of paralytic infusion was 6.6±22.0 hrs.

Each hour of dexmedetomidine exposure decreased DF/CF-ICU-30 by 5.63%(95%CI 0.106-9.42%,p=0.044) while each hour of paralytic exposure decreased the DF/CF-ICU-30 by 7.58%(2.94-21.5%,p=0.010). Age, CCI, number of takebacks, and opioid, propofol and benzodiazepine exposure were not significantly associated with DF/CF-ICU-30.

**Conclusions:** Although the relationship between paralytic use and delirium is well-established, the observation that dexmedetomidine exposure is independently associated with decreased proportion of delirium-free/coma-free ICU days is novel and bears further study.