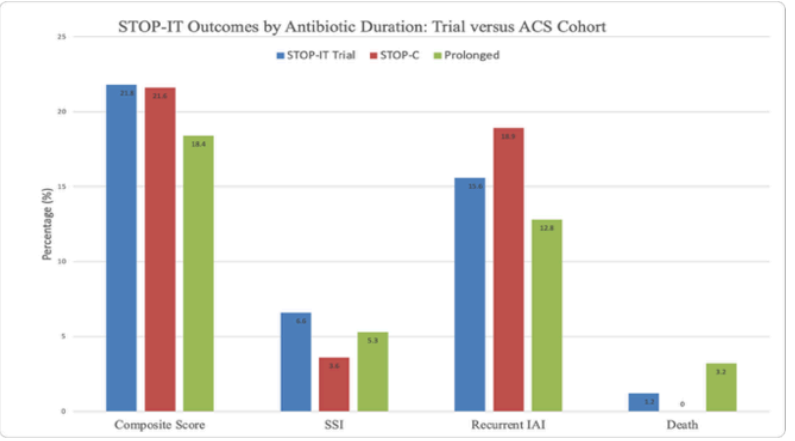
Session IX: Quickshot Session I 1-8
Quickshot 1: 1:45 PM - 1:51 PM

EXTENDING STOP-IT TO PREVIOUSLY EXCLUDED ACUTE CARE SURGERY PATIENTS

Introduction: The STOP-IT trial demonstrated non-inferior outcomes with short-course antibiotic therapy for intraabdominal infection (IAI) after source control; however, trauma and a subset of emergency general surgery (EGS) patients were excluded. We evaluated whether STOP-IT concordant (STOP -C) therapy is associated with comparable outcomes in previously excluded patients (E-STOP).
Methods: We performed a single-center retrospective cohort study at a Level 1 trauma center (Jan 2018-Aug 2025). E-STOP patients ≥16 admitted for operative source control of contamination and IAI were included. Patients excluded: early death (<72hrs) or lack of source control. STOP-C therapy was defined as 3-5 days of antibiotics. Primary outcomes were 30-day composite of surgical site infection, recurrent IAI, or death.
Results: 164 E-STOP patients (125 trauma, 39 EGS) were identified; 37 (22.6%) received STOP-C and 125 (76.2%) received prolonged therapy (PT). STOP-C achieved outcomes comparable to the original STOP-IT trial (composite score 21.6% vs 21.8%), with less SSI (3.6% vs 6.6%) and zero deaths. EGS had no difference between groups in all outcomes ($p>0.005$ for all), while trauma patients in STOP-C group had increased recurrent IAI (17.9% vs 5.3%, $p=0.047$).
Conclusion: Short-course antibiotic outcomes in previously excluded populations demonstrate non-inferior outcomes compared to STOP-IT trial. Further investigation of trauma subsets is warranted to identify trauma-specific risk factors.



Session IX: Quickshot Session I 1-8
Quickshot 2: 1:51 PM - 1:57 PM

PAROXYSMAL SYMPATHETIC HYPERACTIVITY: FORECASTING THE NEUROSTORM

Introduction: A third of patients with traumatic brain injuries (TBIs) may develop paroxysmal sympathetic hyperactivity (PSH). Sparse data exists on diagnosis, outcomes, and the clinical implications of the PSH-AM sub-scores. We aimed to examine PSH development and diagnosis with PSH-AM sub-scores on hospital LOS, ICU LOS, and ventilatory days in patients with severe TBI.

Methods: Retrospective analysis of adult severe TBI patients (GCS≤8) between 2020 and 2025. Patients were stratified by PSH diagnosis and scored with both clinical features scale (CFS) and diagnosis likelihood tool (DLT) of PSH-AM. Univariate analysis compared baseline characteristics between cohorts. Logistic regression examined predictors of PSH. Linear regressions analyzed PSH diagnosis and sub-scores on hospital LOS, ICU LOS, and ventilator days.

Results: Of 519 patients with severe TBI, 86 developed PSH (16.6%). The PSH cohort was younger (36 vs 49; p<.001) and had lower mortality (11% vs 32%; p<.001). Those with PSH had longer median hospital LOS (32 vs 6; p<.001), ICU LOS (17 vs 4; p<.001), and ventilator days (13 vs 3; p<.001). Younger age (OR 0.97; p<.001) and higher injury severity (OR 1.05; p<.001) was associated with PSH development. A 4.7-fold increase in hospital LOS, 3.8-fold increase in ICU LOS, and 3.7-fold increase in ventilator days was associated with PSH diagnosis (p values <.001). The CFS sub-score was higher in younger patients (-.036; p=.018). Each 1-point increase in the DLT was associated with a 13% increase in hospital LOS (p=.001) and a 17% increase in ICU LOS (p<.001).

Conclusion: Despite higher injury severity, patients with PSH were significantly younger with lower mortality. Increases in the DLT were associated with prolonged hospital and ICU LOS, suggesting earlier recognition and treatment may reduce resource utilization.

Session IX: Quickshot Session I 1-8
Quickshot 3: 1:57 PM - 2:03 PM

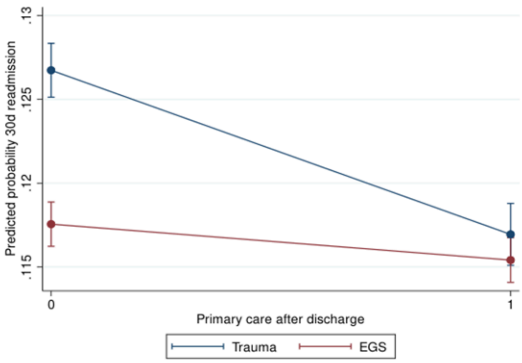
DOES PRIMARY CARE FOLLOW-UP AFTER ACUTE CARE SURGERY REDUCE 30-DAY READMISSIONS? A NATIONWIDE STUDY OF MEDICAID BENEFICIARIES

Introduction: Primary care physician (PCP) follow-up is associated with reduced 30-day readmission in select medical and surgical populations, but its impact on Acute Care Surgery (ACS) patients – admitted due to traumatic injury or emergency general surgery (EGS) conditions – is not well understood. Medicaid enrollees face higher readmission risks due to socioeconomic barriers and limited healthcare services access. We evaluated the association between PCP follow-up and 30-day readmissions among ACS Medicaid patients, hypothesizing that PCP follow-up among trauma patients would correlate with lower readmission rates.

Methods: Using nationwide 2016-2019 CMS Medicaid inpatient claims, we analyzed patients aged 18-63 years admitted for trauma or EGS (primary ICD-10 diagnoses). We excluded those with missing age, sex, in-hospital deaths, or no PCP visit in the prior year to ensure complete benefits. Our primary outcome was 30-day readmission following discharge from index admission. Univariate and multivariate analyses were performed.

Results: Among 877,707 patients, 38.4% were trauma patients vs. 61.6% EGS. Compared to EGS, a higher proportion of trauma patients were male (45.9% vs. 39.5%, standardized mean difference (SMD) 0.18), with lower proportions of PCP follow-up (41.6% vs. 49.3%, SD 0.15) and higher readmissions (12.4% vs. 11.7%, SMD 0.02). In adjusted analyses, PCP follow-up was associated with 11% reduced odds of 30-day readmission among trauma patients (OR 0.89, CI 0.88-0.92). This protective association was attenuated among EGS patients (interaction OR 1.08, 95% CI 1.06, 1.11) (Figure 1).

Conclusion: Among Medicaid ACS patients, PCP follow-up is associated with a more significant decrease in 30-day readmission among trauma patients compared to EGS. As healthcare systems adapt to evolving bundled payment models, effective follow-up strategies are essential for optimizing patient outcomes and curbing costs linked to preventable readmissions for high-risk patients.



Session IX: Quickshot Session I 1-8
Quickshot 4: 2:03 PM - 2:09 PM

MECHANORECEPTOR REGULATION OF STORED RED BLOOD CELL AGGREGABILITY IS CALCIUM DEPENDENT

Introduction: Transfused red blood cells (RBCs) contribute to post-injury hemostasis and thrombosis due to storage-induced phosphatidylserine (PS) exposure on the RBC surface. We hypothesized that aging stored RBCs would exhibit a calcium-driven increase in PS exposure via PIEZO1 mechanoreceptor activation of the phospholipid scramblase.

Methods: Five units of type O whole blood were obtained for analysis at days 21 and 42 of storage. RBC PS was quantified by annexin V staining on flow cytometry at increasing extracellular $CaCl_2$ concentrations (0, 0.5, 1.0, 2.0, and 5.0 mmol/L), with and without the PIEZO1 agonist Yoda1 (2 mM), protein kinase-C agonist PMA (6 mM), and the scramblase antagonist niclosamide (2 mM). Data were analyzed by ANOVA.

Results: At day 21, PS exposure increased in a Ca^{2+}-dependent manner ($p < 0.001$), but PIEZO1 stimulation did not augment this response. At day 42 of storage, RBCs demonstrated a similar Ca^{2+}-dependent increase in PS exposure ($p < 0.001$), but Yoda1-mediated PIEZO1 activation further enhanced PS expression ($p = 0.01$). Compared to day-42 RBCs with 2 mmol/L $CaCl_2$ alone, RBC PS exposure was increased (% change) by treatment with Yoda1 (61%, $p = 0.001$), PMA (61%, $p = 0.001$), and Yoda1 + PMA (51%, $p = 0.005$). However, pretreatment with scramblase antagonist niclosamide abolished the Yoda1 mediated effect (–4.6%, $p = 0.99$).

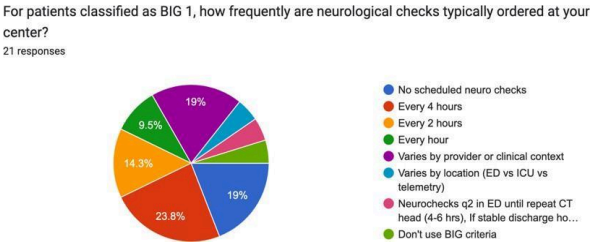
Conclusion: Stored RBCs exhibit a calcium-dependent increase in PS externalization. PIEZO1 stimulation, used to mimic trauma-induced mechanical stress, induces greater Ca-driven PS exposure response in aged RBCs. While similar responses to PMA and Yoda1 imply convergence on protein kinase C signaling, inhibition of PIEZO1 activation by niclosamide identifies scramblase activity as the critical mediator of PS externalization, thereby potentially modulating transfused RBC aggregability after injury.

Session IX: Quickshot Session I 1-8
Quickshot 5: 2:09 PM - 2:15 PM

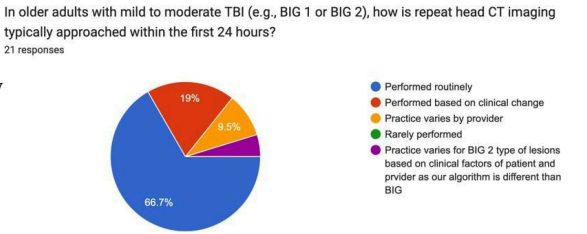
OPTIMIZING NEURO-CHECK FREQUENCY TO REDUCE DELIRIUM RISK IN OLDER ADULTS WITH TRAUMATIC BRAIN INJURY: A MULTI-CENTER SURVEY

Introduction: Older adults with mild to moderate traumatic brain injury (TBI) are at high risk for delirium and other geriatric syndromes, yet the current care model is often driven by neurological monitoring rather than geriatric-informed risk stratification. Frequent neurological monitoring and repeat imaging increase delirium risk through sleep disruption while providing limited clinical benefit. Evidence guiding optimal monitoring in this population is limited and practice patterns vary widely across trauma centers.

Methods: A multi-center survey of trauma centers assessing institutional practices related to neuro-check frequency, repeat head CT imaging, and geriatric considerations in older adults with TBI. Survey items included use of Brain Injury Guidelines (BIG), neuro-check frequency stratified by injury severity, repeat imaging practices, frailty assessment, and perceived drivers of practice variation. Descriptive statistics were used to summarize responses.



Results: Twenty-one trauma centers participated (18 Level I, 3 Level II), representing a 95.5% response rate. BIG implementation was highly variable, with only one-third of centers reporting routine use. Fifteen centers (71%) reported routine delirium assessment. For mild TBI (BIG-1) injuries, 12 centers (52%) reported scheduled neuro-check monitoring (q1–q4 hours), while 5 centers (24%) reported provider- or location-dependent frequency. Routine repeat CT imaging in BIG-1 and BIG-2 injuries was common despite low reported clinical yield, with most centers reporting management changes in ≤5% of cases. Only 9 centers (43%) reported geriatric medicine involvement in TBI care, and frailty was not routinely assessed at 14 centers (67%). Key drivers of variation included provider practice patterns, nursing comfort levels, and lack of standardized protocols.



Conclusions: Monitoring practices for older adults with mild to moderate TBI vary substantially across trauma centers and are often more intensive than their reported clinical yield would suggest.

Standardizing neuro-check frequency using geriatric-informed practices may reduce delirium risk and resource utilization while maintaining patient safety.

Session IX: Quickshot Session I 1-8
Quickshot 6: 2:15 PM - 2:21 PM

PRE-CLINICAL DATA TO ADDRESS ETHANOL INTOXICATION: ETHANOL AND ACETALDEHYDE KINETICS FOLLOWING ENZYMATIC TREATMENT (ADH386) COUPLED WITH SEQUESTERING FORMULA (SF26) IN A PORCINE MODEL

Introduction: Alcohol intoxication is a common challenge in the care of trauma patients, due to neurologic and physiologic impairment. Further, ethanol (EtOH) clearance is capacity-limited. While accelerated EtOH clearance may shorten intoxication and improve impairment, acetaldehyde (AcH) accumulation may prevent resolution. This animal study evaluated EtOH and AcH kinetics following intravenous enzymatic administration (ADH386) with/without adjunctive SF26 after established intoxication.
Methods: Healthy pigs (n=20) received single oral EtOH (1.2 or 2.5 g/kg). ADH386 was administered at 90 min post-gavage; SF26 was given at 105 min in the combination arm. Blood EtOH and AcH were measured serially through 480 min. Post-intervention kinetics were summarized using AUC, Cmax, and Tmax. Hematologic and biochemical safety parameters were monitored.
Results: At 1.2 g/kg, ADH386 reduced EtOH $AUC_{(90–480)}$ by 62.4% vs control; combination therapy preserved enhanced clearance. AcH $AUC_{(90–480)}$ increased markedly with ADH386 and was reduced by combination treatment. At 2.5 g/kg, EtOH $AUC_{(90-480)}$ declined by 50.7% with ADH386, while combination therapy attenuated cumulative and late-phase AcH exposure. Laboratory assessments demonstrated improved hepatic and metabolic recovery with combination therapy, without treatment-related toxicity.
Conclusion: ADH386's markedly accelerated EtOH elimination is preserved with co-administration of SF26, while limiting AcH accumulation and supporting biochemical recovery. This integrated strategy has translational relevance for trauma and emergency care across a wide range of intoxication severities, without inducing secondary toxicity.

Session IX: Quickshot Session I 1-8
Quickshot 7: 2:21 PM - 2:27 PM

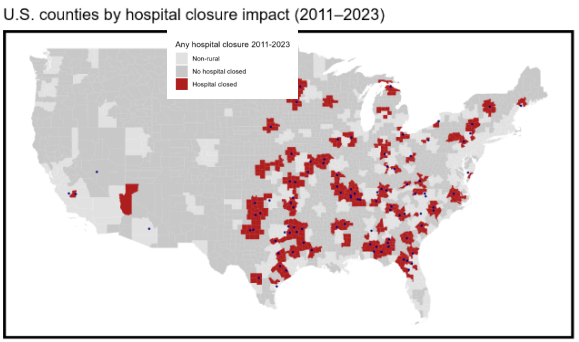
TRANSITION FROM LAPAROSCOPIC TO ROBOTIC CHOLECYSTECTOMY ON AN ACADEMIC ACUTE CARE SURGERY SERVICE

Introduction: The robotic platform offers enhanced dexterity and visualization that have potential to improve cholecystectomy (CCY) outcomes. The acute care surgery (ACS) service at our academic institution made a policy decision to adopt robotic CCY (RCCY) as the default approach. We hypothesize that adoption of RCCY is safe, does not increase operative time in a teaching environment, and decreases rate of unplanned conversion to an open procedure.
Methods: Patient demographics, operative approach, operative times, and clinical outcomes were extracted from the electronic medical record for all adult patients undergoing CCY between 10/1/2020 and 7/31/2025. All cases involved resident surgeons with appropriate supervision, usually in a single-console setting. Primary outcomes included operative approach, case length, and conversion to open.
Results: The study group included 586 patients, 361 (62%) underwent laparoscopic cholecystectomy (LCCY), 212 (36%) RCCY, 4 (0.7%) planned open cholecystectomy (OCCY), and 9 (1.5%) were LCCY converted to OCCY. No RCCY cases were converted to OCCY. Over the study period, the rate of RCCY increased from 0% to 89%, and LCCY declined from 93% to 11%. Median case duration for LCCY was 112 minutes (IQR 86, 144) compared to 117 minutes (IQR 97, 150) for RCCY (p-value < 0.001). Median duration for RCCY was 166 minutes in 2022, dropping to 117 minutes in 2025. There were no common bile duct injuries in the RCCY cohort.
Conclusion: Over a 5-year period, the rate of RCCY on this ACS service increased from 0% to 89%. Median length of RCCY cases was 5-minutes longer than LCCY cases, however RCCY duration decreased markedly over the study period. RCCY can be safely adopted on an academic ACS service, with only a modest increase in operative time and significantly decreased rates of OCCY.

Session IX: Quickshot Session I 1-8
Quickshot 8: 2:27 PM - 2:33 PM

CHARACTERIZING THE IMPACT OF RURAL HOSPITAL CLOSURES ON TRAUMA SYSTEMS AND INJURY MORTALITY

Introduction: Nearly 200 rural hospitals have closed in the last two decades across the US. Although treatment in a designated trauma center is optimal, where distances are long, rural non-trauma centers may perform an important stabilizing role for injured patients. We hypothesized that rural hospital closure would be associated with trauma mortality rates.
Methods: We obtained data on rural hospital closures, county-level mortality rates, and county characteristics from the UNC Sheps Center, Centers for Disease Control, and the American Community Survey. Counties were defined as rural if they had an NCHS Urban-Rural Classification of 5 or 6. We defined affected counties as those for which a hospital closed within a 60 minute drive time of the population-weighted county centroid. Using difference-in-differences (DiD) analyses that account for timing of closures, we compared injury mortality before and after closure in affected counties to injury mortality in unaffected counties. We performed a subgroup analysis focused on counties within 60 minutes of a Level 1 or 2 trauma center.
Results: From 2011 to 2023, 2,282 counties were included with **158** hospitals closures affecting 535 counties with 546,254 injury-related deaths over the study period. Counties affected by closure had lower per capita incomes [median, inter-quartile range] ($22,396 [20,157, 25,144] vs. $24,871 [21,652, 28,210], $p < 0.01$), higher poverty rates (18.2% vs. 15.2%, $p < 0.01$) and more Black residents (4.9% vs. 1.0%, $p < 0.01$). The cumulative mortality rate across all counties was 53.8 deaths/100,000 person-years. The unadjusted mortality rate increased from 45.8 deaths/100,000 persons in 2011 to 63.7 in 2023. DiD analyses revealed no significant effect of hospital closure, regardless of trauma center access.
Conclusion: Trauma mortality has increased over time in rural counties. Although 1 in 4 rural counties lost a hospital during the study period, there was no association with county-level injury mortality. As the healthcare landscape continues to shift, comprehensive trauma system development should address the access needs of rural Americans.



Session XIV: Quickshot Session II 9-26
Quickshot 9: 8:00 AM - 8:06 AM

DOES THE COMBINATION OF WHOLE BLOOD AND TXA INCREASE VTE RATE?

Introduction: In severely injured patients, tranexamic acid (TXA) administered with component (COMP) transfusion has demonstrated benefit without evidence of increased risk of venous thromboembolism (VTE). However, the effect of TXA in combination with whole blood (WB) on VTE risk is unknown. We hypothesized that the coadministration of WB and TXA would increase risk of VTE.

Methods: We retrospectively reviewed all adult trauma patients presenting to a single Level 1 Trauma Center from 2015 to 2024 who received massive transfusion (MT), defined as 2 units within 1 hour or 10 units in 24 hours. Patients were stratified into 4 groups: COMP/no TXA, COMP/TXA, WB/no TXA, WB/TXA. Multivariate analysis determined independent risk factors for VTE. Model covariates included age, mechanism of injury (MOI), Injury Severity Score (ISS), Glasgow Coma Score (GCS), and Shock Index (SI).

Results: 2,414 patients were included. Mean ISS was 26.3 (±15.5) and mortality rate was 36.5%. Overall DVT, PE, and VTE rates are reported in Table 1. When controlled for confounders, there was no significant difference in VTE, DVT, or PE rate between WB/TXA and COMP/TXA and between WB/TXA and WB/no TXA. However, there was a trend towards increased odds of DVT (OR 1.965, 95% CI: 0.974-3.964), with WB/TXA vs WB/no TXA, although this failed to reach statistical significance. WB/TXA was associated with 73.9% increased odds of DVT (OR 1.739, 95% CI 1.018-2.97) compared with COMP/no TXA.

Conclusions: In hemorrhaging patients who receive MT, the combination of WB and TXA conveys a higher risk of VTE. The improved hemostatic potential of resuscitation with WB may limit the benefit of concurrent TXA administration due to the development of a prothrombotic state. Increased vigilance in detection of VTE may be appropriate with the combination of WB and TXA

Groups n=2414	COMP – TXA n=1720	COMP + TXA n=347	WB – TXA n=227	WB + TXA n=120	P
VTE Rate	11.9%	17.0%	12.3%	20.8%	0.01
DVT Rate	8.8%	14.1%	8.8%	17.5%	0.00
PE Rate	5.4%	6.9%	5.3%	6.7%	0.88

Table 1.

Session XIV: Quickshot Session II 9-26
Quickshot 10: 8:06 AM - 8:12 AM

CARBOXYPEPTIDASE B1: A NOVEL, TARGETABLE CONTRIBUTOR TO THROMBOEMBOLIC COMPLICATIONS IN SEVERE ACUTE PANCREATITIS?

Introduction: Severe acute pancreatitis (SAP) is highly morbid and associated with increased thrombotic risk. Systemic release of multiple pancreatic proteases and enzymes occurs in SAP, some of which may alter fibrin and susceptibility to endogenous fibrinolysis, but this concept remains unexplored. Pancreatic carboxypeptidase B1 (CPB1), a pancreatic protease activated by trypsin with the same cleavage specificity as thrombin-activatable fibrinolysis inhibitor, can cleave the N-terminal lysine residues off fibrin, removing the binding sites for co-localization of tissue-plasminogen activator (tPA) and plasminogen and rendering clots that form resistant to natural clearance mechanisms. We hypothesized that circulating CPB1 levels would be elevated in SAP patients and that fibrinolytic resistance would be observed in SAP that could be attenuated by a CPB1 inhibitor.

Methods: Plasma and clinical data were prospectively collected from SAP patients with organ failure (n=10), matched critically ill controls without pancreatitis (n=8), and healthy controls (n=4) with IRB approval and informed consent. Circulating CPB1 levels were measured via ELISA. Clot lysis assays were performed on plasma to measure fibrinolysis in response to tPA with or without DS-1040, a CPB1 inhibitor. Transition midpoints (TMs) were defined as time to >50% clot lysis. Clinical data was analyzed using Mann-Whitney U and Fisher's exact tests, and clot lysis assay results were analyzed using Kruskall-Wallis test. Significance was set at $p< 0.05$.

Results: Demographics were similar between groups. SAP patients had markedly elevated CPB1 levels (521.2 +/-272.7 ng/mL) compared to sick (22.7 +/-29.9 ng/mL, $p< 0.0001$) and healthy controls (5.7 +/-2.7, $p< 0.001$). SAP patients had the highest resistance to tPA-induced fibrinolysis, with significantly higher baseline TMs compared to healthy controls (42.3+/-18.5 vs. 21.4+/-2.7 mins, $p< 0.05$). Treatment of plasma with DS-1040 significantly reduced TMs in SAP compared to healthy controls (14.1+/-7.2 vs. -7.4+/-5.5 % reduction, $p< 0.01$).

Conclusions: Patients with SAP have uniquely elevated circulating levels of CPB1, which may contribute to thromboembolism in SAP via fibrinolysis resistance. Given that DS-1040 has already demonstrated safety in Phase 1 clinical trials for other diseases, CPB1 could readily be targeted if further study corroborates a causative contribution to thromboembolism in SAP.

Session XIV: Quickshot Session II 9-26
Quickshot 11: 8:12 AM - 8:18 AM

TREATMENT OF BLUNT SOLID ORGAN INJURY: HIGHER RELATIVE IR UTILIZATION IS ASSOCIATED WITH IMPROVED TRAUMA CENTER OUTCOMES

Introduction: Interventional radiology (IR) is widely used for hemorrhage control after blunt solid-organ injury, yet center-level use varies substantially. We evaluated whether treatment at high IR-utilization centers is associated with improved outcomes compared with high operative (OR)-utilization centers among patients with blunt splenic, liver, or kidney injuries requiring hemorrhage-control intervention.

Methods: Using ACS-TQIP (2017–2020), we identified adults with blunt splenic, liver, or kidney injury (injured-organ AIS 2–4) who underwent an initial hemorrhage control intervention (IR or OR) and were treated at IR-capable hospitals. For each hospital, IR share was calculated as IR/(IR+OR) among eligible cases and hospitals were assigned to quartiles. Outcomes were compared between high IR-utilization centers (Q4) and high OR-utilization centers (Q1). The primary outcome was in-hospital mortality. Secondary outcomes were massive transfusion within 24 hours (≥10 units PRBCs), transfusion ≥4 units PRBCs within 4 hours, ICU admission, non-home discharge, infectious complications, and composite complications. Multivariable logistic regressions adjusted for demographics, physiology, comorbidity, injury burden, hospital characteristics, and total hospital procedural volume. We performed a sensitivity analysis restricting to hospitals with ≥10 eligible cases.

Results: Among 13,655 patients (IR-first n=5,247; OR-first n=8,408), treatment at high IR-utilization centers versus high OR-utilization centers was associated with lower adjusted in-hospital mortality (9.3% vs 13.0%; aOR 0.60, 95% CI 0.44–0.82) and lower odds of transfusion escalation, including both 24-hour massive transfusion (25.0% vs 35.4%; aOR 0.56, 95% CI 0.37–0.85) and ≥4 units of PRBCs within 4 hours (aOR 0.64, 95% CI 0.50–0.83), but higher ICU admission (91.3% vs 88.3%; aOR 1.48, 95% CI 1.11–1.96). Organ-specific analyses showed mortality benefit for splenic and liver injuries with no benefit for kidney injuries. Findings were unchanged in sensitivity analysis restricting to hospitals with ≥10 eligible cases.

Conclusion: These findings emphasize the importance of interdisciplinary approach to trauma; future work should standardize hemorrhage-control pathways across trauma centers and define the patient and injury characteristics that identify who benefits most from IR-first versus operative hemorrhage control.

Session XIV: Quickshot Session II 9-26
Quickshot 12: 8:18 AM - 8:24 AM

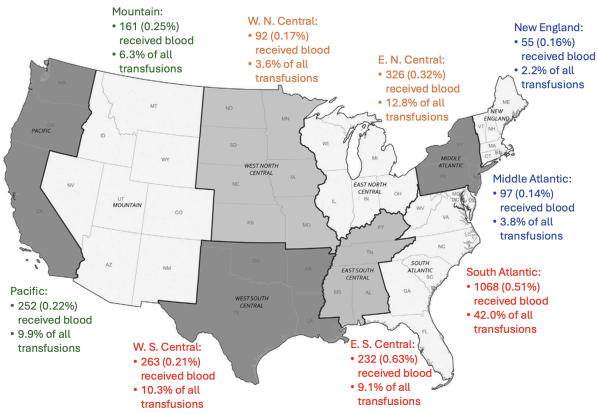
REGIONAL VARIABILITY IN PRE-HOSPITAL BLOOD PRODUCT ADMINISTRATION FOR HEMODYNAMICALLY UNSTABLE TRAUMA TRANSPORTS: NEMSIS STUDY

Introduction: The first hour following traumatic injury—commonly termed the "Golden Hour"—is critical to patient survival. In many settings, particularly those influenced by varying degrees of urbanicity, this interval is dominated by emergency medical services (EMS) transport, a process that varies substantially across agencies, trauma systems, and geographic regions. Despite increasing emphasis on early resuscitation, regional variation in the prehospital administration of blood products has not been comprehensively evaluated at a national level.

Methods: The U.S. National Emergency Medical Services Information System (NEMSIS), a national repository of voluntarily reported EMS encounters, was queried to identify all primary trauma transports in 2024. Prehospital blood product utilization was examined by US Census region for trauma transports overall, and in the hemodynamically unstable subset (SBP< 90mmHg or shock index >1).

Results: In 2024, NEMSIS recorded 6,328,114 trauma-related transports, of which 3,183 (0.05%) received prehospital blood. In the hemodynamically unstable subset (12.9%, 817,001), blood utilization was 0.32% (2,612). There were marked disparities in utilization overall, and in the hemodynamically unstable subset (Figure 1). The South Atlantic region accounted for 42.0% of all transfusions, whereas the New England region contributed only 2.2% of transfusions.

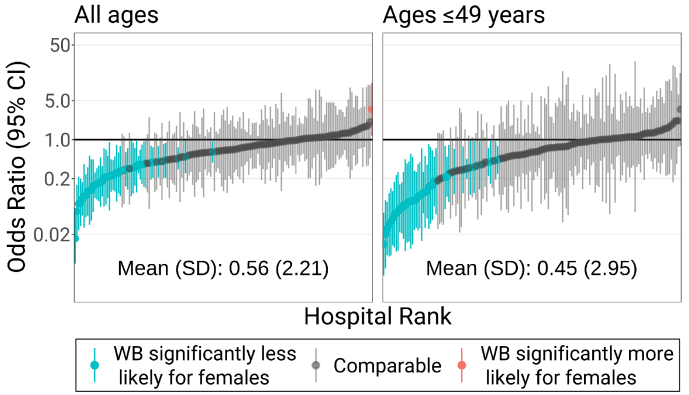
Conclusion: Substantial regional variation exists in the prehospital administration of blood products across the U.S., with overall utilization remaining exceedingly low—even among hemodynamically unstable trauma patients. These findings highlight a critical gap in early resuscitation practices and underscore the need for standardized protocols, improved resource allocation, and further investigation into barriers and outcomes associated with prehospital transfusion.



Session XIV: Quickshot Session II 9-26
Quickshot 13: 8:24 AM - 8:30 AM

ON THE BASIS OF SEX: WHOLE BLOOD RESUSCITATION DISPARITIES

Introduction: There is increasing use of whole blood (WB) vs. component therapy (CT) for civilian trauma resuscitation, but access to WB has not been equal. Due to alloimmunization concerns, some hospitals bar females of childbearing age from receiving WB or prefer CT for these patients. This study examined the distribution of the sex disparity in receipt of WB.
Methods: Adult (≥18 years) patients in shock (systolic pressure <90 or shock index >0.9) who received WB or CT within 4h of arrival to level I or II trauma centers that had WB available in the 2022-2023 Trauma Quality Improvement Program database were included. To examine sex differences, risk- and reliability-adjusted odds ratios (ORs) describing the relationship between sex and receipt of WB were calculated for each hospital.
Results: The sample included 20,421 patients at 165 trauma centers, 74% were male and 54% received WB. As indicated by ORs frequently deviating from 1.0, known confounds could not fully explain sex differences in receipt of WB. The figure shows 124 hospitals (75%) had ORs <1, meaning females were at least descriptively less likely than males to receive WB; this difference was significant at 44 hospitals (27%; blue). Females were significantly more likely to receive WB at one hospital (red). These differences were more pronounced among patients ≤49 years.



Conclusion: Even after accounting for differences in presentation, females were significantly less likely to receive WB at many hospitals. This may represent an unjust allocation of a potentially life-saving resource based on sex that is disproportionate to alloimmunization risks.

Session XIV: Quickshot Session II 9-26
Quickshot 14: 8:30 AM - 8:36 AM

WRONG HOSPITAL, WRONG OUTCOME: IMPACT OF CARE FRAGMENTATION FOLLOWING TRAUMA LAPAROTOMY

Introduction: Care fragmentation (CF), defined as readmission to a non-index admission hospital, has been identified as a predictor of poor outcomes after traumatic injury. Trauma laparotomy (TL) is a common procedure with risk of complications and readmission. Risk factors for CF following TL and its effects on outcomes are unknown. We hypothesized that CF after TL is associated with increased mortality during readmission compared with continuity of care (CC).

Methods: The National Readmissions Database (2016 - 2022) was queried for adult patients with primary ICD-10 diagnosis codes for traumatic injury, an ICD-10 procedure code for laparotomy, and 90 day readmission. Patients with CF were compared to patients with CC. Demographics, mechanism of injury, severity of injury (Trauma Mortality Prediction Model), procedures, and discharge disposition were collected. The primary outcome was in-hospital death during readmission. Univariate comparisons of patients with CC versus CF were performed for index and readmission visits. Multivariate logistic regression was used to determine predictors of in-hospital death during readmission.

Results: A total of 18,095 TL patients were identified. From these, 2346 (13.0%) were readmitted within 90 days. The average age of readmitted patients was 43 (SD 18) years, and the majority (66%) were male. Of these readmissions, 482 (20.5%) experienced CF. Compared to CC, patients with CF were more likely to have a non-home discharge from index admission (21.2% vs 13.2%, $p = 0.003$), a longer time to readmission (28.8 vs 19.6 days, $p < 0.001$), and a higher Elixhauser comorbidity score (2.0 vs 1.4, $p < 0.001$). The most common diagnosis at readmission was surgical site complication (surgical site infections, seroma, wound dehiscence, fascia dehiscence; 24%), followed by bowel obstruction (18%). On multivariate regression analysis, CF was the only predictor of in-hospital death during readmission (OR 3.86, 95% CI 1.24-12.04, $p = 0.02$).

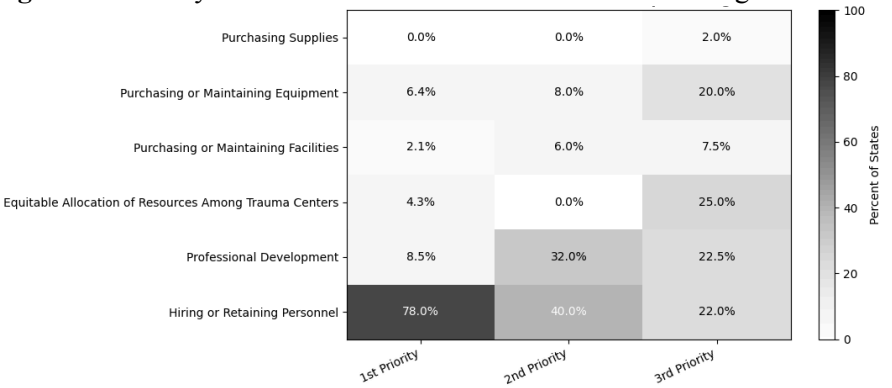
Conclusions: CF is common following TL and is associated with an increased risk of death on readmission. Patients who have non-home discharge from the index admission are more likely to experience CF. This population may benefit from targeted post-discharge care planning and follow-up to reduce the incidence of CF and delays to readmission.

Session XIV: Quickshot Session II 9-26
Quickshot 15: 8:36 AM - 8:42 AM

FROM SIRENS TO SYSTEMS: MAPPING EMS AND TRAUMA CARE ACROSS AMERICA

Introduction: Variation in state EMS and trauma system organization may contribute to inequities in access, timeliness, and outcomes of trauma care.
Methods: We surveyed state EMS and trauma system leaders from all 50 states and the District of Columbia using a 52-item instrument. We collected state-level data about pre-hospital trauma triage and treatment protocols, legislation, financial resources, and trauma center oversight.
Results: We achieved a 100% response rate (N=51). Most EMS and trauma systems operate within state public health programs (80%) or public safety agencies (8%). Most states (84%) reported standardized pre-hospital trauma triage protocols that mirrored national recommendations, but pre-hospital treatment protocols varied widely. Nearly all (98%) state EMS leaders reported insufficient resources to fulfill their system mission. Most states would prioritize hiring, retention, and professional development if they received additional funding for their EMS systems (Figure 1).
Conclusions: State EMS and trauma systems in the U.S. vary markedly in organization, resources, and pre-hospital capabilities. Inadequate financial resources result in EMS workforce shortages, which may exacerbate inequities in access to trauma care. National efforts to standardize system organization and fund services may improve outcomes.

Figure 1. EMS System Priorities For Use of Additional Funding



Session XIV: Quickshot Session II 9-26
Quickshot 16: 8:42 AM - 8:48 AM

EFFECT OF INTRAOPERATIVE HEPARIN DOSE ON OUTCOMES AFTER THORACIC ENDOVASCULAR AORTIC REPAIR IN BLUNT THORACIC AORTIC INJURY

Introduction: Thoracic endovascular aortic repair (TEVAR) is widely used for blunt thoracic aortic injury (BTAI), but the optimal intraoperative heparin dosing strategy remains uncertain due to competing risks of thrombosis and hemorrhage. We examined the association between heparin dose and clinical outcomes in polytrauma patients.
Methods: Adult patients with BTAI undergoing TEVAR over a 10-year period were identified from the database of a Level I trauma center. Heparin strategy was categorized as no heparin (NH), low-dose heparin (LDH, <100 IU/kg), and high-dose heparin (HDH, ≥100 IU/kg). Thrombotic events, major bleeding, and net adverse events were analyzed across heparin dose categories using multivariable logistic regression adjusted for injury severity, solid organ injury, and intracranial hemorrhage.
Results: Of 100 patients with blunt thoracic aortic injury, 57 underwent TEVAR. Of these, 12 (21.1%) received NH, 20 (35.1%) LDH, and 25 (43.9%) HDH. Net adverse events significantly differed across dose categories (75.0% NH vs 25.0% LDH vs 48.0% HDH; p=0.022). Thrombotic events were lowest in the LDH group (50.0% NH vs 15.0% LDH vs 24.0% HDH; p=0.088), while major bleeding rates were similar across groups (41.7% NH vs 20.0% LDH vs 36.0% HDH; p=0.362). Compared with NH, LDH was associated with significantly lower risk of net adverse events (OR 0.13, 95% CI 0.03-0.66), whereas HDH showed no statistically significant reduction (OR 0.34, 95% CI 0.08-1.53; p=0.159). LDH was associated with lower adjusted odds ratio of net adverse events compared with HDH (OR 0.33, 95% CI 0.08-1.32; p=0.117), though not statistically significant. Administration of heparin showed similar associations compared with no heparin.
Conclusion: In patients undergoing TEVAR for BTAI, low-dose heparin was associated with fewer thrombotic and net adverse events without increased bleeding, suggesting a more favorable risk profile in selected trauma patients.

Session XIV: Quickshot Session II 9-26
Quickshot 17: 8:48 AM - 8:54 AM

SHAPING RISK: AORTIC ARCH TYPES AND THEIR IMPACT ON BLUNT THORACIC AORTIC INJURY PREVALENCE AND OUTCOMES

Introduction: Blunt thoracic aortic injury (BTAI) is a leading cause of trauma death, with thoracic endovascular aortic repair (TEVAR) favored for reduced morbidity and mortality. Although arch morphology and bovine variants influence elective endovascular repair, their impact in BTAI remains unclear.

Methods: We performed a retrospective analysis of the Aortic Trauma Foundation registry (2014–2025). Patients with documented aortic arch type and bovine arch status were included. Comorbidities, injury characteristics, and intervention outcomes were compared.

Results: Of 1,376 patients, 758 (55.1%) had documented arch type and 729 (53.0%) had documented bovine arch status. Arch Type II and III patients were older than Type I ($p < 0.01$) but similar age-adjusted comorbidities. Overall injury severity was comparable; however, type III patients had more moderate chest trauma ($p=0.05$) and higher rates of grade II BTAI ($p=0.03$). Among patients undergoing TEVAR, arch type III had higher intraoperative blood loss ($p=0.04$), more transfusions ($p<0.01$), and increased type 1 endoleak ($p<0.01$). Injury location varied, with Type I more frequently affecting the lesser curvature and Type III the greater curvature ($p<0.01$). Of 729 patients, 135 (18.5%) had a bovine arch. These patients were similar in age, comorbidities, and thoracic injury severity. However, patients with bovine arch were more likely to sustain severe BTAI (grade IV/V, $p=0.01$), require TEVAR ($p<0.01$), and trended towards increased type 1 endoleak ($p=0.09$).

Conclusion: Arch morphology is associated with distinct injury patterns in BTAI. Type III arches showed more moderate injuries yet were underrepresented in the cohort suggesting survivorship bias. Injury location varied by arch geometry. Bovine arches were linked to more severe injury and higher repair complication rates, demonstrating that arch anatomy significantly influences injury risk and clinical outcomes after BTAI.

Session XIV: Quickshot Session II 9-26

Quickshot 18: 9:20 AM - 9:26 AM

IMPROVING SURVIVAL PREDICTION IN PEDIATRIC TRAUMA: DEVELOPMENT AND COMPARATIVE PERFORMANCE OF PREDICTIVE MODELS IN A MAJOR TRAUMA CENTER

Introduction: Accurate survival prediction is essential for trauma system benchmarking and quality improvement. Although the Pediatric Trauma Score (PTS) remains widely used, multivariable models may offer greater precision. We compared PTS with two new survival models in a high-acuity pediatric trauma population.

Methods: We conducted a retrospective cohort study of 1,047 injured children (<18 years) treated at a Level I trauma center (2011–2019). Three approaches were evaluated: PTS; an age-adjusted TRISS model (Peds-TRISS); and a Glasgow-adjusted ICISS. Discrimination was assessed using AUROC with global comparison via DeLong's test, and calibration with Hosmer–Lemeshow testing. Internal validation used bootstrap resampling. Survival benchmarking for Peds-TRISS was performed using M and Z statistics.

Results: Overall mortality was 5.9%, predominantly among adolescents with intentional injuries. PTS demonstrated good discrimination (AUROC 0.93). Peds-TRISS and Glasgow-adjusted ICISS achieved superior discrimination (AUROC 0.98) with good calibration. Global comparison showed significant differences in predictive performance (p=0.004). Peds-TRISS demonstrated appropriate benchmarking performance (M=0.93; Z=0). Continuous age modeling and incorporation of Glasgow Coma Scale improved predictive accuracy.

Conclusion: In this high-acuity pediatric trauma cohort, multivariable survival models significantly outperformed PTS and enabled robust benchmarking. Model optimization improves trauma system performance assessment and supports international comparisons.

Session XIV: Quickshot Session II 9-26
Quickshot 19: 9:26 AM - 9:32 AM

LOW-DOSE TIE2 AGONIST MODULATES EARLY GROWTH-FACTOR SIGNALING AND IMPROVES LUNG MORPHOLOGY AFTER THERMAL INJURY IN MICE

Introduction: Thermal injury disrupts endothelial homeostasis and contributes to pulmonary complications. We observed an early rise in angiopoietin-2 (Ang-2), a Tie2 antagonist implicated in vascular leak and capillary permeability in sepsis and ARDS. In a murine burn model, plasma Ang-2 increases along with pulmonary congestion, inflammation, neutrophil infiltration, and tissue edema. We utilized a well-established burn model to test the hypothesis that a Tie2 agonist AV-001 modifies growth-factor signaling and lung architecture 24 h after burn.
Methods: Male C57BL/6 mice (8-10 weeks) underwent sham or 12.5% TBSA scald burn injury and received placebo or AV-001 (17.5 or 35 μg). At 24 h, heparinized plasma and lung homogenates were analyzed using the Mouse Angiogenesis & Growth Factor 16-Plex Discovery Assay. Lungs were inflated, fixed, stained with H&E, and quantified in QuPath (v0.6.0) and ImageJ for (infiltration, alveolar airspace, and pneumocyte counts). An automated ImageJ macro was used as a secondary pipeline. Statistics: one-way ANOVA with Tukey; morphometrics vs burn placebo by Welch t-tests with Holm adjustment (Prism v10.6.1).
Results: Burn injury increased plasma EGF ($p<0.05$) which was attenuated with low dose AV-001 ($p<0.01$) EGF decreased ($p=0.007$). Burn increased plasma Ang-2 concentration versus sham ($p < 0.0001$); Ang-2 did not differ significantly between burn placebo and AV-001 groups. For QuPath/ImageJ morphology, low-dose AV-001 increased air area and reduced total cells ($p<0.0001$for each). The automated macro showed a consistent increase in air percent Burn 45.84±4.80 vs Burn-LD 52.34±1.46.
Conclusions: Twenty-four hours after thermal injury, low-dose AV-001 produced significant growth-factor balance and improved lung morphology. Future studies will evaluate whether AV-001 reduces post-burn pneumonia/ARDS.

Session XIV: Quickshot Session II 9-26
Quickshot 20: 9:32 AM - 9:38 AM

WHOLE-BLOOD ELISPOT DETECTS EARLY MYELOID IMMUNE DYSFUNCTION IN SEVERELY INJURED TRAUMA PATIENTS

Introduction: Increased injury severity is associated with more secondary infections and worse outcomes after trauma, reflecting early immune dysregulation. Severe injury (ISS≥25) carries particularly high infectious risk, with ICU sepsis rates approaching 50%, underscoring the need to define mechanisms of immune dysfunction. The ELISPOT assay enables near real-time (~24h) quantification of myeloid & lymphoid cell function from whole blood. We sought to determine whether targeting innate or adaptive immune function within one week of injury can improve outcomes.
Methods: Whole blood was obtained (N=15) from trauma patients (43% female, mean age=52±19y) at 4 & 7 days (D) after hospital admission. Next, ELISPOT was conducted as previously described without diluting the blood. Assays included LPS stimulation (myeloid cell TNF-α production) and CD3/28 stimulation (lymphocyte IFN-γ production). Analyses included the number of spot-forming units (SFU)/well (# of cells producing cytokine) and spot size (amount of cytokine per cell).
Results: ISS≥25 patient myeloid cells did not respond to LPS stimulation regarding TNF-α SFUs at D4 & 7 while ISS<25 patients did ($p<0.05$). D 7 ISS≥25 patients also did not have an increase in TNF-α spot size after stimulation. IFN-γ production remained intact to CD3/28 stimulation in both cohorts at D4 & 7 ($p<0.05$).
Conclusion: After severe trauma, myeloid cell dysfunction predominates subacutely in leukocytes. Altering myeloid cell differentiation & function may be a preferable target to improving severely injured patients' outcomes in the ICU. ELISPOT also allows precision medicine by identifying those patients that have altered myeloid cell function who may benefit from therapeutics.

Session XIV: Quickshot Session II 9-26
Quickshot 21: 9:38 AM - 9:44 AM

PALLIATIVE SERVICE CONSULTATION CRITERIA IMPLEMENTATON IMPROVES TIMELY GOAL CONCORDANT CARE IN TRAUMA PATIENTS

Introduction: Incorporating palliative services into trauma care helps ensure patient-centered goals. In 2022, we established a palliative service, trainee didactics, and a palliative rotation for fellows. Our study aims to evaluate the documentation of code status, surrogate decision-makers (SDM), need for invasive procedures, and outcomes after implementation.
Methods: We conducted a retrospective study from 1/1/2021 to 5/31/2024. Patients were stratified into groups: PRE- and POST-palliative services implementation. A one-year period (7/2022-6/2023) was excluded to allow for integration. We used screening criteria to trigger consultation (age >75 years; age 65-74 years with $\geq$2 comorbidities; >18U of blood transfused; or TBI requiring neurosurgical intervention); however, consult was at the attending's discretion. We compared patients who met criteria in PRE and POST groups. We performed a separate analysis of POST cohort to assess timing of consult (<3 days[EARLY] vs. >3 days[LATE]) on outcomes.
Results: Of 2,887 patients included (1,467 PRE; 1,420 POST), 684 met screening criteria: 343 PRE-criteria and 341 POST-criteria. Documentation of code status (37% vs. 59%, p <0.0001) and SDM (7% vs. 63%, p <0.0001) was higher in the POST-criteria group. The initial code status differed between groups (p=0.02), with more patients full code in the PRE-criteria cohort. There was no difference in tracheostomy or long-term enteral access. ICU length of stay (LOS) (6 vs. 5 days, p=0.05) and LOS (10 vs. 8 days, p=0.01) were decreased in the POST-criteria cohort, though mortality was higher (18% vs. 26%, p=0.007). Of the 1,420 patients in the POST cohort, 271 (19%) received a consultation: 174 EARLY and 124 LATE. The LATE cohort was younger (71 vs. 58 years, p=0.003), more severely injured (ISS 20 vs. 22, p=0.02), had longer time to code status (1 vs. 6 days, p<0.0001), and SDM documentation (1 vs. 5 days, p<0.0001). They received more tracheostomies (22 vs. 36%, p=0.01) and long-term enteral access (14% vs. 24%, p=0.03), had longer ICU LOS, ventilator days, and LOS (p<0.0001).
Conclusion: The implementation of palliative services, education, and training creates a "halo effect" among providers, leading to improved documentation of code status and SDM. Pre-defined criteria may improve goal-concordant care. Refining the criteria for palliative services may help identify patients who would benefit from early consultation.

Session XIV: Quickshot Session II 9-26
Quickshot 22: 9:44 AM - 9:50 AM

CEREBRAL VENOUS SINUS THROMBOSIS AS A MARKER AND POTENTIAL TARGET FOR MANAGEMENT OF CRITICAL INTRACRANIAL HYPERTENSION IN BLUNT HEAD TRAUMA

Introduction: Cerebral venous sinus thrombosis (CVST) is a recognized complication of traumatic brain injury (TBI), yet its clinical implications remain unknown. By obstructing cerebral venous outflow, CVST may exacerbate intracranial hypertension ultimately necessitating surgical decompression. Clarifying this relationship could establish CVST not only as a diagnostic marker of elevated intracranial pressure (ICP) but also as a potential therapeutic target for intervention. We hypothesized that TBI patients with CVST present with higher initial ICPs and require higher rates of decompressive surgery compared to those without CVST.

Methods: This was a retrospective review of blunt TBI patients with skull fractures presenting to a Level I trauma center from 2012–2022 who underwent CT or MR venography to evaluate for CVST. Patients were stratified by the presence of CVST. Penetrating injuries were excluded. Patient demographic and injury characteristics were collected. The primary outcome was initial ICP following placement of an ICP monitor (bolt or external ventricular drain). Secondary outcomes included surgical decompression (craniectomy or craniotomy), hospital and intensive care unit length of stay, and in-hospital mortality. Student's t-test, Wilcoxon rank-sum, and chi-square tests were used for univariate analysis as appropriate. Multivariate regression was performed to adjust for potential confounders and assess the independent effect of CVST on initial ICP.

Results: 428 patients met inclusion criteria, 281 (66%) without CVST and 147 (34%) with CVST. Patients with CVST were younger (40.3 vs 45.6 years, $p=0.006$) and more likely to have severe or critical head abbreviated injury scale scores (78.9% vs 54.1%, $p<0.001$), subdural hematomas (76.9% vs 63.3%, $p=0.005$), and larger midline shift (2.6 ± 5.2 vs 1.6 ± 4.6 cm, $p=0.04$). Median initial ICP was significantly higher in the CVST group (30 [16-30] vs 19 [10-25] cm H_2O, $p=0.001$). In unadjusted analyses, CVST patients underwent surgical decompression more frequently (33.3% vs 21.0%, OR = 1.9, 95% CI 1.2 – 3.0, $p=0.005$), with higher rate of craniectomy (27.9% vs 10.7%, $p<0.001$). Patients presenting with CVST had a 7-fold higher risk of an initial critical ICP (>30 cmH_2O) than those without when controlling for age, the presence and size of subdural or epidural hematoma, and amount of midline shift (OR 6.8, 95% CI 1.8–25.8, $p=0.04$).

Conclusion: Traumatic CVST is independently associated with severe intracranial hypertension and increased need for surgical decompression, specifically craniectomy, suggesting that CVST may serve as a critical diagnostic marker for patients at risk of refractory ICP elevation. Moreover, these findings raise the possibility that CVST itself contributes to elevated ICP. Routine screening for CVST in severe TBI may enhance early identification of patients at risk for critical ICP and guide targeted therapeutic interventions to mitigate secondary brain injury and reduce surgical decompression. Future studies are needed to better elucidate the nature of this relationship and to guide management strategies.

Session XIV: Quickshot Session II 9-26
Quickshot 23: 9:50 AM - 9:56 AM

COLORECTAL TRAUMA IN THE SETTING OF PANCREATIC INJURY: IS OPERATIVE STRATEGY ASSOCIATED WITH POSTOPERATIVE OUTCOMES?

Introduction: Optimal management of colorectal trauma in the setting of concomitant pancreatic injury remains controversial. We hypothesized that resection with primary anastomosis would not be associated with worse infectious or mortality outcomes compared to ostomy creation.
Methods: Adult trauma patients with pancreatic injury who also underwent colon resection were identified in the National Trauma Data Bank (2019-2023). Patients were stratified by operative strategy; resection with primary anastomosis (n=421) versus ostomy creation (n=379). Outcomes were compared in unmatched and propensity score–matched cohorts (n=546). Multivariable logistic regression was used to evaluate predictors of organ space surgical site infection (SSI) and mortality.
Results: In the unmatched cohort (n=800), the ostomy group (n=421) had higher rates of penetrating trauma and greater pancreatic injury severity ($p \leq 0.02$). After matching (n=546), groups were similar with respect to admission injury severity, abdominal AIS, and pancreatic injury grade. In the matched cohort, organ space SSI rates were comparable between groups (7.7% vs 9.2%, p=0.54), while in-hospital mortality was higher among ostomy patients (13.9% vs 7.3%, p=0.01). On multivariable analysis, operative strategy was not independently associated with organ space SSI, though early transfusion requirement predicted infection (p=0.012). Ostomy creation was independently associated with mortality (OR 2.27, 95% CI 1.23–4.17), as was increasing Injury Severity Score (p=0.03).
Conclusion: For patients with colorectal trauma and concomitant pancreatic injuries, resection and anastomosis did not have worse outcomes when compared to ostomy creation.

Session XIV: Quickshot Session II 9-26
Quickshot 24: 9:56 AM - 10:02 AM

DEEP LEARNING FOR TRAUMATIC ABDOMINAL SOLID ORGAN INJURY DETECTION: A COMBINED MULTI-CENTER DATASET TRAINING APPROACH

Introduction: The heterogeneity of Computed Tomography (CT) scans across different institutions and scanner manufacturers poses a significant challenge for the generalizability of artificial intelligence (AI) models in trauma care. To address this, we developed a 3D deep learning system trained on a diverse, combined dataset comprising images from both a single tertiary center and a large-scale international multi-center registry. This study aims to validate the robustness and diagnostic accuracy of this mixed-training approach for detecting injuries of the liver, spleen, and kidney.

Methods: We established a comprehensive training dataset by combining venous-phase CT scans from Chang Gung Memorial Hospital (CGMH, Taiwan) and the RSNA Abdominal Trauma Detection AI Challenge dataset (representing 23 institutions from 14 countries). The model architecture utilized a 3D nnU-Net framework for organ segmentation followed by injury detection. The training process leveraged this heterogeneous data to learn scanner-agnostic features. Model performance was evaluated on an independent, held-out test set to assess its diagnostic capability. Performance metrics included Area Under the Receiver Operating Characteristic Curve (AUROC), sensitivity, specificity, and accuracy, determined at the optimal Receiver Operating Characteristic (ROC) cutoff.

Results: The model trained on the combined dataset demonstrated robust diagnostic performance. For splenic injury detection, the system achieved an AUROC of 0.961, with an accuracy of 92.5%, sensitivity of 89.7%, and specificity of 93.0%. For liver injury, the model yielded an AUROC of 0.899, accuracy of 87.3%, sensitivity of 81.4%, and specificity of 89.0%. Renal injury detection showed an AUROC of 0.892, with a high accuracy of 96.1% and specificity of 97.7%, while maintaining a sensitivity of 80.0%. Visual explainability maps confirmed that the model correctly localized the injured organ, consistent with expert annotations.

Conclusion: Training a deep learning model on a mixed dataset derived from both single-center and diverse multi-center sources yields a robust diagnostic tool for abdominal solid organ injuries. The system maintains high specificity and accuracy across organs, validating the efficacy of large-scale, heterogeneous data training in improving model reliability for clinical acute care applications.

Session XIV: Quickshot Session II 9-26
Quickshot 25: 10:02 AM - 10:08 AM

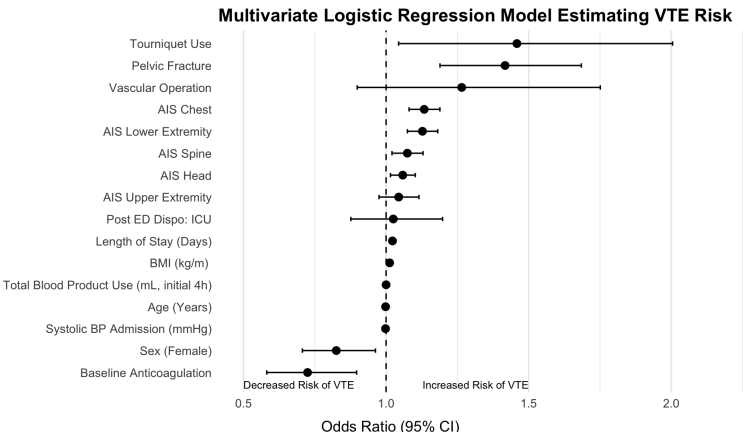
STOP THE BLEED - SPOT THE CLOT: THE ASSOCIATION BETWEEN POST-INJURY TOURNIQUET USE AND VENOUS THROMBOEMBOLISM

Introduction: Patients with extremity injuries treated with tourniquets have all elements of Virchow's triad that predispose one to venous thromboembolism (VTE): endothelial injury, hypercoagulability, and venous stasis. We hypothesized that post-injury tourniquet use is associated with VTE events.

Methods: The Pennsylvania Trauma Outcomes Registry was used to create a cohort of patients with injured extremities evaluated using extremity vascular ultrasound. Multivariate logistic regression and a propensity score matched cohort were used to define the association between post-injury tourniquet exposure and VTE while controlling for clinically relevant covariates.

Results: Our cohort contained 369 patients who had a post-injury tourniquet applied and 11,990 patients with extremity injury who did not have a tourniquet placed. Using the entire cohort and controlling for clinically relevant covariates (listed on figure y-axis) with multivariate logistic regression modeling the odds ratio of VTE event with tourniquet use was 1.46 (95% CI: [1.04, 2.00], p=0.023). The propensity score-matched cohort contained 364 tourniquet and 364 non-tourniquet patients and the proportion of VTE events in each group was 15% and 9.9%, respectively (p=0.043).

Conclusions: Post-injury tourniquet use is associated with VTE events. We recommend routine extremity vascular ultrasound screening for patients who have had a tourniquet applied as part of their post-injury care and continued education regarding appropriate indications for tourniquet use.



Session XIV: Quickshot Session II 9-26
Quickshot 26: 10:08 AM - 10:14 AM

CREATING DEADLY HABITS: THE CROSS-STATE INFLUENCE OF WEAKER PERSONAL SAFETY DEVICE LAWS ON MOTOR VEHICLE MORTALITY

Introduction: Motor vehicle safety devices such as seatbelts and helmets are proven to save lives, and laws mandating their use increase compliance and reduce mortality. Yet, it remains unclear whether an individual's home-state safety laws influence their behavior when traveling in states with different requirements. We hypothesized that motor vehicle occupants from states with less stringent or no mandatory seatbelt or helmet laws would have higher odds of dying while not using these safety devices when injured in states that require their use.
Methods: This retrospective cross-sectional study examined fatal adult motor vehicle crashes (cars and motorcycles) occurring outside an occupant's home state from 2017–2023, using the National Highway Traffic Safety Administration's Fatality Analysis Reporting System. The primary outcome was death while unrestrained or unhelmeted. The primary exposure was the driver's home-state safety laws, categorized as primary vs. secondary seatbelt enforcement or mandatory vs. no helmet laws. Multivariable logistic regression adjusted for confounders including demographics, crash environment, vehicle factors, driver characteristics, and the crash state's laws.
Results: Among 146,655 eligible car crashes and 26,301 motorcycle crashes, 16,210 (8.6%) and 2,473 (9.4%) occurred outside the occupants' home state. Of these out-of-state crashes, 7,370 (45.5%) car occupants and 1,018 (41.2%) motorcyclists died unrestrained or unhelmeted, respectively. Adjusted analysis demonstrated occupants from states with secondary seatbelt laws (OR 1.21, 95% CI 1.10–1.33; $p< 0.001$) or no helmet laws (OR 1.91, 95% CI 1.54–2.38; $p< 0.001$) had significantly higher odds of dying without using safety devices in states with stricter laws.
Conclusions: Motor vehicle occupants injured outside their home state were significantly more likely to die unrestrained or unhelmeted if they resided in states with less stringent safety laws, suggesting that safety behaviors may be shaped more by home-state legislation than the state in which the crash occurs. Similar to the federal standardization of blood alcohol concentration limits during the 1990s, a unified national approach to seatbelt and helmet legislation may be necessary to meaningfully improve compliance and reduce preventable deaths across state lines.