Session XIV: Quickshot Session I 1-13
Quickshot 1: 8:00 AM – 8:06 AM

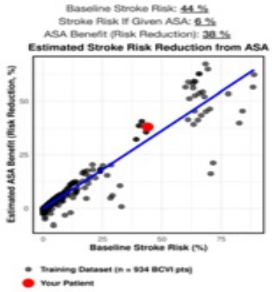
PERSONALIZED STROKE RISK IN BLUNT CEREBROVASCULAR INJURY (BCVI): AN INTERACTIVE ONLINE TOOL

Introduction: Stroke risk generally correlates to the Biffl grading system in BCVI. Although antiplatelet (AP) therapy is the mainstay of stroke prevention, no point-of-care clinical decision-support tool exists to guide optimal timing for AP therapy. We sought to develop an interactive online calculator that incorporates patient-specific demographics and injury characteristics to estimate stroke risk and risk reduction with AP administration.

Methods: BCVI patients (n=934) >15 years at a Level I Trauma Center were retrospectively collected (January 2016-December 2023) and analyzed. Machine learning methods (random forests and gradient boosting machines) were employed to predict stroke risk and AP risk reduction. The model was implemented as an R-based Shiny online application.

Results: Strongest predictors for stroke were the greatest Biffl grade of carotid (OR [95%CI] =1.89 [1.42–2.48]), the greatest Biffl grade of vertebral injuries (1.27 [1.00–1.62]), and the multifocal carotid injuries (2.71 [0.99–7.02]). Patients treated with AP were 70% less likely to have a stroke (number needed to treat = 20). Utilizing patient demographics and injury characteristics, the machine learning models provided stroke risk and risk reduction with AP, and this was successfully integrated into an interactive online tool (Figure 1).

Conclusion: We identified key stroke risk factors and developed a generalizable predictive model for personalized risk assessment. The integration of patient-specific risk-benefit assessments into clinical decision-making will guide the optimal timing of AP initiation while reducing variability in AP therapy. External validation is warranted to further predict and prepare this tool for broader clinical applicability.



Session XIV: Quickshot Session I 1-13
Quickshot 2: 8:06 AM – 8:12 AM

TO DIVERT OR NOT TO DIVERT: RETHINKING PROXIMAL DIVERSION IN ISOLATED NON-DESTRUCTIVE PENETRATING RECTAL TRAUMA

Introduction: This study evaluates the impact of proximal diversion vs primary repair and/or non-operative management on outcomes in isolated extraperitoneal penetrating rectal injuries.
Methods: Retrospective analysis of TQIP (2017-2022) was done to isolate adults with penetrating rectal trauma. Patients with other injuries of AIS≥ 3 were excluded. Patients were dichotomized into proximal diversion (PD+) and no proximal diversion (PD-). PD (+) included patients who underwent isolated PD and PD in conjunction with repair or resection while PD (-) included patients who underwent primary repair without PD or non-operative management. Propensity score matching (PSM) was performed in 1:1 ratio to adjust for age, race, sex, mechanism of injury, shock index and AAST grade of injury. In-hospital outcomes were assessed.
Results: Out of 2,396 patients, 48.3% had high grade injury and most common mechanism was firearms. 55.2 % were in PD (+) out of which 56.9% were only diversion. In PD (-) 58.7% were managed non-operatively. After PSM, there were 498 patients in each group. There was no significant difference in mortality between PD (+) and PD (-). Lower complications and higher routine discharge were seen in PD (-). Length of hospital stay was lower in PD (-).
Conclusion: While management of high grade and firearm injuries do require expert clinical judgement, the majority of patients with isolated extraperitoneal penetrating rectal injuries can be safely managed without proximal diversion.

	PD (+) (n = 498)	PD (-) (n = 498)	*p*-value*
Routine Discharge	246 (49.4%)	330 (66.8%)	<0.001
Inpatient Rehab	50 (10.0%)	38 (7.7%)	<0.001
Hospital LOS	17.48 ± 19.02	11.59 ± 13.10	<0.001
Unplanned OR	39 (7.8%)	16 (3.2%)	0.001
Sepsis	15 (3.0%)	1 (0.2%)	<0.001
AKI	20 (4.0%)	8 (1.6%)	0.021

LOS: Length of Stay, AKI: Acute Kidney Injury.
*Independent T-test and Chi-square test.

Session XIV: Quickshot Session I 1-13
Quickshot 3: 8:12 AM – 8:18 AM

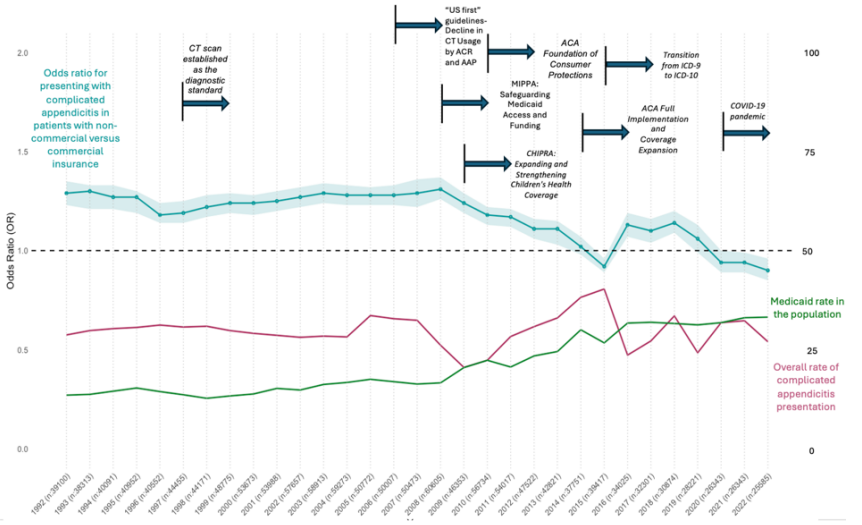
THE IMPACT OF MEDICAID POLICIES ON REDUCING INSURANCE-BASED DISPARITIES IN COMPLICATED APPENDICITIS RATES: A 30-YEAR ANALYSIS

Introduction: Complicated appendicitis (CA) is often considered a proxy for delayed care and barriers to timely healthcare access. This study examines trends in the proportion of commercially insured (CI) and non-commercially insured (NCI) patients diagnosed with CA over 30 years, along with changes in Medicaid coverage.

Methods: Using the 1992-2022 AHRQ-HCUP National Inpatient Sample databases, we identified appendicitis patients under 65, excluding those with Medicare or immunosuppression. Logistic regression with survey weights compared the annual odds of CA between CI and NCI patients, adjusting for age, sex, and comorbidities. We also analyzed Medicaid coverage trends and assessed major policy changes affecting access.

Results: We analyzed 1,360,077 patients, with the annual proportion of patients with CA ranging from 20.1% to 40%. Patients with NCI had higher odds of CA from 1992 to 2013, but this trend declined starting in 2008. By 2014, the likelihood was similar between insurance groups. Medicaid coverage increased from 13.5% to 33.2%, with the most notable increase in coverage starting in 2008, coinciding with the implementation of the MIPPA (2008), CHIPRA (2009), and ACA (2010 and 2014).

Conclusion: Over three decades, the gap in CA rates between commercially and non-commercially insured patients has narrowed, aligning with Medicaid expansion. This suggests that policy-driven healthcare improvements promote timely healthcare access.



Session XIV: Quickshot Session I 1-13
Quickshot 4: 8:18 AM – 8:24 AM

TRAUMATIC INJURY IN PREGNANCY - AN AAST-SPONSORED MULTI-INSTITUTIONAL REVIEW OF FETAL OUTCOMES

Introduction: Traumatic injury occurs in approximately 6-8.3% of pregnancies and is the leading cause of non-obstetrical maternal death, accounting for 20-46% of maternal deaths during pregnancy. Data regarding traumatic injury in this cohort is limited and lacks granularity. We sought to examine the impact of post-injury maternal-fetal risk factors on pregnancy loss.

Methods: This was an AAST sponsored multi-institutional study of traumatically injured pregnant females (TIPF) at 20 U.S. trauma centers (18 Level 1, 2 Level 2) between 2009-2024. The primary outcome of interest was pregnancy loss.

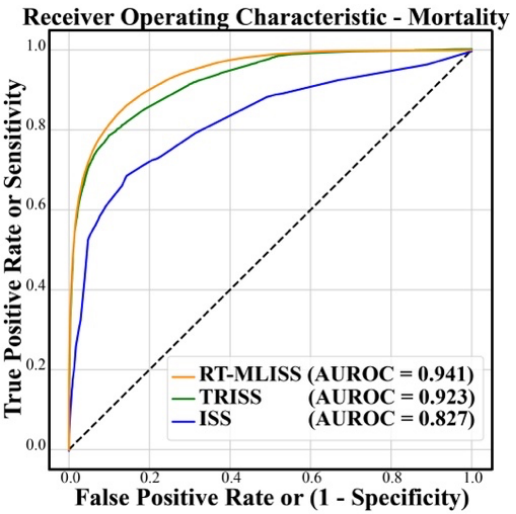
Results: 2,034 TIPF with a mean maternal age of 26.6 (±6.3) years were included. Mean gestational age was 29 (±9.3) weeks and injury during the 3rd trimester was most frequent (44.1%). The most common injury mechanisms were MVC (70.8%), falls (10.1%), assaults (6.5%), and gunshot wounds (4.6%). Pregnancy loss occurred in 4.7% of patients. Risk factors for pregnancy loss on multivariate logistic regression are demonstrated in Table 1.

Conclusion: Traumatically injured pregnant females are at high risk of adverse outcomes. Identification of key risk factors for pregnancy loss may guide future trauma care protocols and improve outcomes.

Session XIV: Quickshot Session I 1-13
Quickshot 5: 8:24 AM – 8:30 AM

IS IT TIME TO RETIRE THE INJURY SEVERITY SCORE (ISS)? ISS IS OUT, REAL-TIME MACHINE LEARNING-ISS (RT-MLISS) IS IN

Introduction: Injury Severity Score (ISS) standardizes traumatic injury severity but does not account for patient physiology and is not available in real-time. Augmented scoring systems such as RTS and TRISS also have limitations and cannot be computed in real-time. We hypothesized that machine learning (ML) techniques could derive a score which can be computed in real-time and better predicts mortality than ISS or TRISS.
Methods: The American College of Surgeons Trauma Quality Improvement Project Databank (2017-2021) was reviewed, excluding burns, mechanism of injury of "other", and patients with missing data for trauma type, mortality, ISS or TRISS. A preliminary ML model determined the eight most influential variables: age, initial GCS, SBP, heart rate, temperature, weight, ISS, and mechanism. A final Real-Time, Machine Learning Injury Severity Scoring model (RT-MLISS) was then created using only these eight variables while substituting ISS with "number of injuries," and optimizing for area under the receiver operator curve (AUROC). This was compared to both ISS and TRISS predictions using paired bootstrap testing.
Results: Among 4,521,790 patients (3.5% mortality), RT-MLISS (AUROC 0.941 [95% CI 0.940-0.942]) outperformed ISS (AUROC 0.827 [95% CI 0.824-0.829]) and TRISS (AUROC 0.923 [95% CI 0.921-0.924]) in the prediction of in-hospital mortality ($p < 0.0001$, Figure 1).
Conclusion: RT-MLISS has higher discriminatory ability than ISS and TRISS in the prediction of mortality and can be derived in real-time, offering potential early risk stratification in trauma populations.



Session XIV: Quickshot Session I 1-13
Quickshot 6: 8:30 AM – 8:36 AM

HAVE WE LEVELED THE PLAYING FIELD IN ACCESS TO PELVIC ANGIOEMBOLIZATION IN PATIENTS WITH PELVIC FRACTURE ASSOCIATED HEMORRHAGE? A MULTICENTER AAST STUDY

Introduction: Time to angioembolization (PAE) for pelvic fracture related hemorrhage may be associated with worse outcomes. It has been suggested in the literature that patients admitted during nights and weekends may have a significant increase in time to PAE compared to those admitted during weekdays. This delay in intervention has also been correlated with increased mortality. However, these studies were performed prior to the creation of a standard criterion in 2014 by the American College of Surgeons regarding interventional radiology response time. We hypothesized that patients presenting during nights and weekends would have similar time to intervention and mortality, compared to those who arrive during the weekday (Monday-Friday 7am to 7 pm).

Methods: We conducted a multicenter prospective (2018-2022) observational study of patients with blunt pelvic fracture related hemorrhage who underwent PAE. Patients were divided into those who were admitted during nights and weekends versus those who arrived during the weekday (Monday-Friday 7am to 7 pm). Our primary outcomes were time to intervention and mortality. We performed an additional subgroup analysis on patients at greatest need of an emergent intervention by excluding patients not transfused within 24 hours of arrival and those who underwent angiography >4 hours from arrival.

Results: Of 381 included patients, 236 (61.9%) arrived during nights or weekend and 145 (38.1%) arrived during weekdays. There was no difference between the groups in time to angiography (195.0 min vs 188.0 min; p=0.34) or mortality (17.8% vs 15.2%; p=0.5). On subgroup analysis of the 199 patients most in need of PAE there was again no difference in mortality in the cohorts (p=0.76).

Conclusion: Evolving standards for trauma center verification continue to strengthen the care of the injured patient as this study demonstrated similar time to intervention and mortality regardless of when patients arrived to the trauma center.

Session XIV: Quickshot Session I 1-13
Quickshot 7: 8:36 AM – 8:42 AM

TRANEXAMIC ACID ADMINISTRATION FOLLOWING SHOCK: PROTECTIVE OR INJURIOUS EFFECTS ON THE MICROCIRCULATION?

Introduction: The glycocalyx is an extracellular matrix which has significant prognostic implications for the microcirculation. Tranexamic acid (TXA) reduces fibrin degradation, thus may be protective of the glycocalyx. We assessed if early TXA administration would be protective of the glycocalyx in a shock-induced cellular microfluidic model.
Methods: Human umbilical vein endothelial cells (HUVEC) were established in microfluidic flow devices and subjected to control or shock conditions (1% O_2 + epinephrine; Shock) in whole blood labelled with fluorescent fibrinogen. TXA was added at 1hr or 3 hr after shock. Glycocalyx integrity was indexed by shedding syndecan-1(Syn-1) and glycocalyx thickness. We assessed A Disintegrin and Metalloproteinase-17 (ADAM-17) and matrix metalloproteinase (MMP) activities. Fibrin deposition assessed clot formation.
Results: Syn-1, glycocalyx thickness, ADAM-17 activity, MMP activity, and Fibrin deposition were all significantly different among groups (Table 1).
Conclusion: TXA reduces proteinase activity and protects the glycocalyx. However, TXA's effect is more profound with earlier administration. The administration of TXA at 3 hours following shock did not prevent clot formation (fibrin deposition) in our microfluidic flow model.

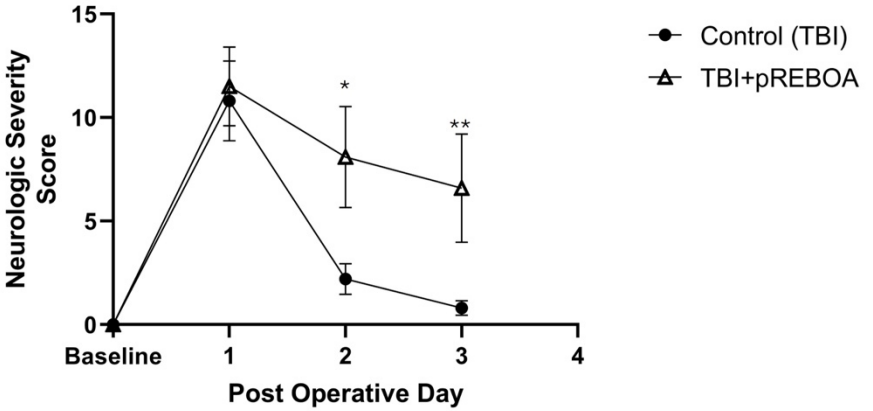
Table 1: Mean ± SD, N = 6 for each group, *p<0.05 vs. Control, #p<0.05 vs Shock (No TXA), $p<0.05 vs. Shock + TXA 1h

	Syn-1 (pg/ml)	Glycocalyx thickness (Fluor intensity)	ADAM-17 activity (RFU/µg/protein)	MMP activity (RFU/min))	Fibrin deposition (Fluor intensity)
HUVEC control (TXA 1hr)	29.8 ± 5.5	260 ± 22	2.15 ± 0.9	44.3 ± 4.4	65 ± 12
Shock(1hr)	94.9 ± 5.4*	119 ± 14*	8.79 ± 1.9*	205.8 ± 16.3*	705 ± 26*
Shock (3hr)	91.9 ± 5.8*	130 ± 18*	8.25 ± 1.4*	201.2 ± 15.4*	690 ± 27*
Shock+ TXA 1 hr.	39.3 ± 4.3#	253 ± 21#	2.75 ± 0.4#	62.5 ± 6.1*	82 ± 15#
Shock+ TXA 3hr.	62.9 ± 4.4*#$	182 ± 14*#$	6.23 ± 1.3*#$	96.6 ± 6.2*#$	600 ± 33*#$

Session XIV: Quickshot Session I 1-13
Quickshot 8: 8:42 AM – 8:48 AM

PROLONGED PARTIAL AORTIC OCCLUSION WORSENS NEUROLOGIC OUTCOMES WITHOUT AFFECTING BRAIN LESION SIZE IN A SWINE MODEL OF TRAUMATIC BRAIN INJURY AND HEMORRHAGE

Introduction: Traumatic brain injury (TBI) and hemorrhagic shock are the leading causes of death in trauma. The partially occluding resuscitative endovascular balloon occlusion of the aorta device (p-REBOA) has emerged as a tool for hemorrhage control with reduced ischemic consequences, allowing for prolonged use. Prior studies in swine show no increase in brain lesion size with prolonged p-REBOA use, but long-term neurologic outcomes remain unknown. We hypothesized that prolonged p-REBOA deployment would worsen neurological outcomes.
Methods: Female Yorkshire swine (n=5/group; 37-42 kg) were subjected to a controlled cortical impact plus common iliac artery injury and randomized to either: 1) p-REBOA for two hours (p-REBOA group) followed by vascular repair, or 2) immediate vascular repair with no p-REBOA for 2-hours (control). Daily neurologic severity scores [NSS; 0 (normal)-32 (comatose)]), and brain lesion size on day 3 were compared.
Results: Blood loss, resuscitation, and physiologic parameters were similar between both the groups. While the brain lesion size did not differ between the two groups (p= 0.55), NSS were significantly worse in the p-REBOA group compared to controls (*, p=0.048 at 48 hours and **, p=0.006 at 72 hours, respectively).
Conclusion: This is the first study to show that prolonged p-REBOA is associated with worse neurologic outcomes, independent of the brain lesion size.



Session XIV: Quickshot Session I 1-13
Quickshot 9: 8:48 AM – 8:54 AM

TBI IN MICE AND PIGS INCREASES SUSCEPTIBILITY TO BACTERIAL PNEUMONIA BY MODULATING THE INNATE IMMUNE RESPONSE

Introduction: Traumatic brain injury (TBI) leads to immune dysregulation that is known to predispose patients to infections. We hypothesize that tissue injury increases the presence of Danger Associated Molecular Pattern (DAMP) molecules that result in this immune dysregulation, and further, that free heme is particularly deleterious. To test this, we developed both murine and porcine models of TBI with subsequent bacterial lung inoculation to study the role of tissue injury on susceptibility to lung infection.

Methods: C57Bl6 mice (n=4-6 per group) or Yucatan mini swine underwent sham or a mild TBI with standardized cranial weight drop. 24 hours later (mice), or immediately post (pigs), animals underwent intratracheal inoculation with 10^4-10^6CFU of *S. aureus*. 24 hours after bacterial inoculation, animals were euthanized, and lungs were harvested for further analyses. Plasma from mice, pigs and human TBI patients were analyzed for the presence of free heme.

Results: In mice, pigs and humans, TBI leads to elevated plasma free heme compared to uninjured controls (data not shown). In both mice and pigs, TBI decreased the ability to clear bacteria from the lungs as compared to infection (Figure 1A). In mice, this corresponded with increased neutrophil infiltration and TNF expression (Fig 1B). However, neutrophils from human TBI patients exhibited decreased phagocytosis and chemotaxis as compared to healthy controls(Fig1C).

Conclusion: TBI leads to elevated plasma free heme in mice, pigs, and humans, which is correlated with significantly decreased lung bacterial clearance after mild TBI. Further studies are required to understand the link between brain injury, heme and a dysfunctional immune response that prevents these cells from effectively clearing bacteria.

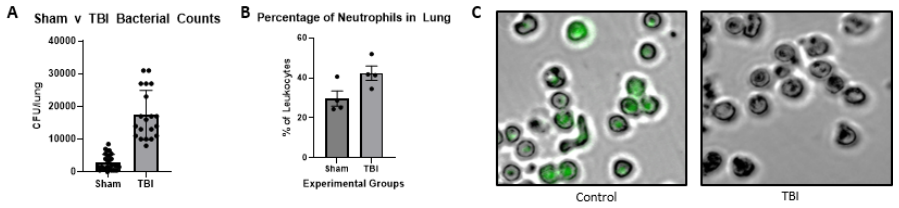


Figure 1: A. TBI mice have significantly higher bacterial counts 24h after inoculation compared to sham. B. Neutrophil percentage in lung is increased after TBI alone. C. Human TBI neutrophils exhibit less phagocytosis as compared to controls using pHrodo fluorescence assay.

Session XIV: Quickshot Session I 1-13
Quickshot 10: 8:54 AM – 9:00 AM

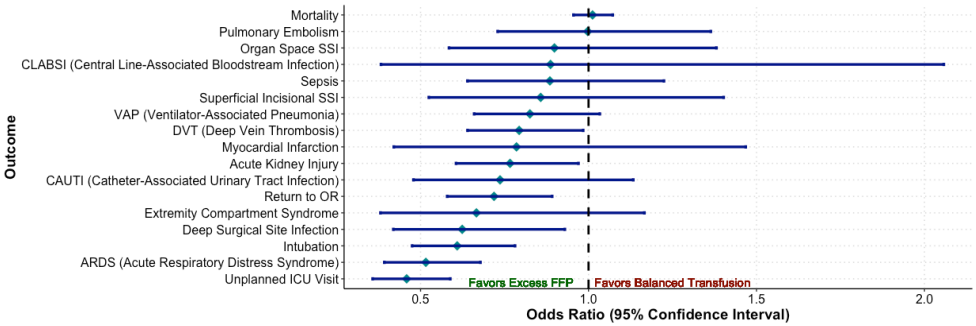
HIGH FFP: PRBC RATIOS ARE ASSOCIATED WITH LOWER RATES OF AKI AND ARDS IN TQIP: A PROPENSITY SCORE MATCHED ANALYSIS

Introduction: Balanced transfusion with (1:1:1) ratios of fresh frozen plasma (FFP), packed red blood cells (PRBC), and platelets is a core tenet of management in traumatic hemorrhagic shock. However, pre-clinical data suggest that PRBCs contribute to endothelial dysfunction while FFP may be protective. We compare clinical outcomes of excess FFP (>1.1:1) against balanced transfusion.

Methods: Trauma patients (>18 years) in TQIP (2017-2022) who received ≥1U FFP and 1U PRBC within 4h were included. Those with whole blood or FFP: PRBC < 0.9 were excluded. Balanced Transfusion (BT) group received FFP: PRBC 0.9-1.1 and excess FFP (xFFP) received FFP:PRBC >1.1. Comparison groups were propensity matched based on odds of mortality and compared by multivariable regression.

Results: 50,594 patients were analyzed (75% male, median age 38, ISS 25). 31,960 (63%) were BT and 18,634 (37%) xFFP. Propensity matching generated 16,939 pairs (mean standard difference < 0.05). After multi-variable adjustment, xFFP was associated with 49% decreased odds of ARDS (p< 0.001), and 24% decreased odds of acute kidney injury (p=0.027) compared to BT. There was no difference in hospital mortality (OR 1.01, 95% CI 0.95-1.07).

Conclusions: We found that early excess FFP (FFP:PRBC ratio >1.1) was associated with lower odds of ARDS and AKI compared to balanced transfusion (FFP:PRBC ratio 0.9-1.1).



Session XIV: Quickshot Session I 1-13
Quickshot 11: 9:00 AM – 9:06 AM

DELAYED-PHASE CT IN HIGH-GRADE RENAL TRAUMA: INCREASED INTERVENTIONS WITHOUT IMPROVED OUTCOMES AND THE PREDICTIVE VALUE OF SYMPTOMS AT FOLLOW-UP

I**ntroduction**: Screening for urinary extravasation (UE) after high-grade renal trauma using delayed-phase CT (DPCT) has been associated with increased urological intervention rates. We investigated the association of DPCT with major complications and urological intervention rates, while analyzing the predictive value of clinical symptoms of UE at follow-up DPCT.
Methods: This retrospective cohort study analyzed patients aged 18-89 with AAST grade III-V renal injuries at a Level 1 Trauma Center from 2013-2023. Data was obtained from the institutional trauma registry and electronic medical records. Univariable and risk-adjusted multivariable regressions assessed the association of DPCT with major complications and urological intervention rates. The sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of UE signs and symptoms (leukocytosis, fever, flank pain, hematuria) at follow-up DPCT were calculated, using chi-squared to determine significance ($p< 0.05$).
Results: Of 234 patients, 232 had any abdominal CT scan (99.1%), 101 (43.2%) underwent DPCT, and 2 (0.9%) were only graded intraoperatively. Baseline characteristics were similar between DPCT vs. no-DPCT, including injury grade ($p=0.13$). DPCT patients had higher rates of urological interventions compared to no-DPCT (21.8% vs 2.3%, $p< 0.001$) but similar complication rates (16.8% vs 16.5%, $p=0.95$). After multivariable regression, DPCT was not associated with reduced odds of major complications (OR 1.49, $p=0.33$) but with increased odds of undergoing urological intervention (OR 12.07, $p< 0.001$). The presence of at least one symptom at follow-up DPCT had a sensitivity and NPV of 100% for UE ($p=0.019$).
Conclusions: DPCT was strongly associated with urological intervention after risk adjustment and all asymptomatic patients had negative follow-up DPCTs. While our results suggest potential overtreatment regarding urological interventions and follow-up imaging, further prospective studies are needed to confirm these findings given our study's retrospective limitations.

Session XIV: Quickshot Session I 1-13
Quickshot 12: 9:06 AM – 9:12 AM

REEVALUATING C-SPINE CLEARANCE: THE ROLE OF MRI AFTER NEGATIVE CT IN BLUNT TRAUMA PATIENTS

Introduction: In blunt trauma patients reporting persistent neck pain despite a negative CT, an MRI is traditionally necessary to determine if a rigid collar can be removed. However, recent recommendations have questioned the utility of MRI, suggesting it infrequently leads to more than conservative management. This shift in practice may lead to premature clearance of the c-spine and removal of the rigid collar. This study aims to report the incidence and treatment outcomes of clinically significant injuries detected by MRI but not CT.

Methods: Retrospective analysis of adult blunt c-spine trauma patients with both a CT c-spine and an MRI c-spine during hospitalization between January 2018 and December 2022. Patients were excluded if their initial CT revealed any acute abnormality. Radiology reports, treatments, and outcomes were analyzed.

Results: 560 patients were included, with a mean age of 49 and 67% male. MRI of these patients revealed a fracture in 18 (3.2%), disc protrusion in 136 (24.3%), and spondylosis in 112 (20.0%). Of the 18 patients with a fracture on MRI, 4 (22.2%) were treated with fusion, 9 (50.0%) were treated with a rigid collar, and 5 (27.8%) received no additional treatment. Of the patients with disc protrusion on MRI, 16 (11.8%) were treated with fusion, 30 (22.1%) were treated with rigid collar, 4 (2.9%) were treated with cervical thoracic orthosis, and 86 (63.2%) received no additional treatment. Of the patients with spondylosis on MRI, 7 (6.3%) were treated with fusion, 26 (23.2%) were treated with rigid collar, 1 (0.9%) was treated with soft collar, and 78 (69.6%) received no additional treatment. Overall, 39 or 7.0% of patients with a negative CT c-spine and a positive MRI c-spine were treated with cervical fusion.

Conclusion: Utilization of MRI after negative CT can reveal previously undetected acute c-spine injuries. Detection of these injuries with MRI leads to surgical intervention in 7% of cases.

Session XIV: Quickshot Session I 1-13
Quickshot 13: 9:12 AM – 9:18 AM

LEFT BEHIND: ASSOCIATION OF PREHOSPITAL FIELD UNDER-TRIAGE AND OUTCOMES AFTER INJURY

Introduction: Despite perception of the negative effects of field under-triage for injured patients, relatively little literature exists documenting worse outcomes, and trauma registry data is limited by missing patients that never arrive at a trauma center. Our objective is to evaluate the impact of under triage on outcome in a broad group of injured patients transported to trauma and non-trauma centers.
Methods: Retrospective cohort study of injured adult patients in the Pennsylvania state discharge database (PHC4). Under-triage was defined as patients not transported initially to a level I/II trauma center who met anatomic, mechanism, or age national field triage criteria using ICD-10 codes. Our primary outcome was in-hospital mortality. Secondary outcomes were hospital length of stay (LOS) and discharge disposition (home vs non-home). The association between outcomes and under-triage were determined using doubly robust targeted maximum likelihood estimation (TMLE), adjusting for age, sex, race, mechanism of injury and ISS.
Results: 60,523 trauma patients were included, with an under-triage rate of 53.4%. TMLE demonstrated increased relative risk of in-hospital mortality associated with under-triage (Table), but shorter LOS (-0.36 days [95%CI -0.49, -0.23]). For discharge disposition, a generalized additive model identified a significant change in the effect of under-triage at 60 years old. For patients under 60, under-triage is associated with higher chances of discharge home; however, for patients older than 60, under-triage is associated with a lower risk of discharge to home (Table).
Conclusion: We demonstrate among injured adults transported to both trauma and non-trauma centers in Pennsylvania that prehospital field under-triage based on the national field triage guidelines is associated with an increased risk of mortality and less likelihood of discharge home among older adults.

Outcome	Age group	Relative risk (RR)	95% CI
In-hospital mortality	>= 18 yrs old	1.15	[1.03, 1.29]
Home vs not Home	>= 60 yrs old	0.96	[0.94, 0.99]
	<60 yrs old	1.03	[1.01, 1.05]

Session XV: Quickshot Session II 14-26
Quickshot 14: 9:40 AM – 9:46 AM

LOW MORTALITY IN SEVERE BLUNT AND PENETRATING TRAUMA WITH AN INSTITUTIONAL REBOA PROTOCOL

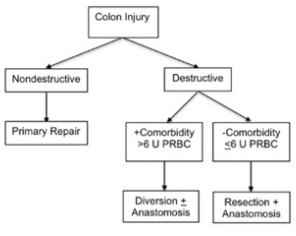
Introduction: Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) has emerged as a valuable adjunct in the management of hemorrhagic shock. This study aims to evaluate the value and the potential impact that an established institutional aortic occlusion protocol has on the overall survival of critically injured trauma patients.
Methods: We conducted a retrospective descriptive study of patients admitted to a Level I trauma center between 2015 and 2024 who required REBOA for hemorrhagic shock. Indications included a systolic blood pressure (SBP) ≤70 mmHg upon arrival and/or subsequent hemodynamic deterioration. Collected variables included demographic data, admission physiology, Injury Severity Score (ISS), Abbreviated Injury Scale (AIS), estimated blood loss, total occlusion time, and hemodynamic response to REBOA. The primary outcome was mortality. Continuous variables are reported as medians with interquartile ranges (IQR).
Results: One hundred thirty patients were included, with a median age of 32 years. The majority were male 112 (86%), and penetrating trauma accounted for 65% (84) of cases. Median SBP upon admission was 70 mmHg (IQR 54-90), with a median ISS of 25 (IQR 25-34). The median AIS score was 4 (IQR 3-5) for thoracic injuries and 5 (IQR 4-5) for abdominal injuries. Non-compressible torso hemorrhage was present in 85% (110) of patients. Estimated blood loss was 3000 mL (IQR 2000-4000mL). Major vascular injuries were identified in 191 cases, with 10 aortic injuries. All patients underwent surgical and/or endovascular hemorrhage control in addition to REBOA placement. The median time of REBOA insertion was 5 minutes (IQR 5-15), and the median total occlusion time was 35 minutes (IQR 25-53). Median SBP increased from 60 mmHg (IQR 40-76) pre-REBOA to 110 mmHg (IQR 90-134) post-REBOA. The median ICU length of stay was 7 days (IQR 3-14). The overall mortality rate was 22% (95% CI: 15.1-29.2); 35.1% (13/37) in blunt trauma and 16.1% (15/93) in penetrating trauma.
Conclusion: The implementation of an institutional REBOA protocol in trauma patients with hemorrhagic shock facilitates rapid hemorrhage control without delaying definitive interventions. This approach enables timely hemodynamic stabilization and favors survival in patients with life-threatening injuries.

Session XV: Quickshot Session II 14-26
Quickshot 15: 9:46 AM – 9:52 AM

BREAKING PROTOCOL: SHOULD DESTRUCTIVE COLON INJURIES BE MANAGED DIFFERENTLY IN A BALANCED BLOOD PRODUCT RESUSCITATION ERA?

Introduction: Traumatic colon injuries are a significant source of morbidity. For several decades, institutional colon injury management protocol advises diverting ostomy for destructive injuries if patients receive >6 units packed red blood cells (pRBCs) or have medical comorbidities. With advancements in transfusion strategies, interventional radiology, and medical management, this protocol warrants re-evaluation.
Methods: We retrospectively reviewed five years of traumatic colon injuries at an urban Level 1 trauma center, analyzing destructive injuries treated with resection and anastomosis without diversion. Injury characteristics, management, and outcomes were collected. Factors associated with anastomotic leak (AL), abscess, reoperation, and mortality were assessed. Variables included 24-hour pRBC transfusion, base deficit, body mass index (BMI), comorbidities, pancreatic injury, shock index (SI), and protocol adherence.
Results: Among 559 patients with operative colon injuries, 213 underwent resection and anastomosis without diversion. AL occurred in 10 (4.7%) patients. 13 patients violated protocol, including 9 receiving >6 units pRBCs without diversion. Protocol adherence resulted in lower abscess rates (24% vs. 54%, p=0.043) and drain placement (17% vs. 46%, p=0.007), with no difference in reoperation (8.5% vs 7.7%, p=0.999) or mortality (3% vs 0%, p=0.526). Other variables associated with abscess formation included BMI >35 (p=0.039) and pancreatic leak (p=0.001). Logistic regression identified pRBCs (AOR 1.37, p=0.001) and SI (AOR 8.33, p=0.019) as abscess predictors, and pRBCs was significant for abscess even at a >2 pRBC cutoff (p=0.015). SI was the sole factor for AL requiring reoperation with ostomy (AOR 3.15, p=0.018).
Conclusions: In colon injury patients undergoing resection and anastomosis without diversion, transfusion correlates with abscess but not AL, reoperation, ostomy, or mortality. SI may better predict AL and reoperation. The colon injury protocol should be re-evaluated.

Operative Management of Colon Injuries



Indicators of a Destructive Colon Injury

Penetrating	Blunt
Wound >50% of colon circumference	Serosal tear ≥ 50% colon circumference
Complete transection	Full-thickness perforation
Devascularized segments	Mesenteric devascularization

Significant Co-morbidities

Chronic renal failure
CHF
AIDS
Cirrhosis
Uncontrolled diabetes
Chronic steroid use

Session XV: Quickshot Session II 14-26
Quickshot 16: 9:52 AM – 9:58 AM

HEALTHCARE COSTS AFTER OPERATIVE VS. NON-OPERATIVE APPENDICITIS MANAGEMENT

Introduction: Use of non-operative management for uncomplicated appendicitis is increasing. We hypothesized that healthcare costs would be lower for patients who underwent appendectomy than those with an in-situ appendix over the year after initial diagnosis.
Methods: Using MarketScan®, an all-payers claims insurance database, we extracted patients presenting to the emergency department (ED) with acute appendicitis and without perforation from 2017-2021, and either underwent appendectomy during index presentation or non-operative treatment. We examined differences in cost of initial encounter and within one-year.
Results: Of 26,469 patients presenting with uncomplicated appendicitis, 24,005 (90.6%) underwent appendectomy. The median cost of the index encounter was higher at $15,248 in the operative group compared to $5,753 in the non-operative group ($p< 0.001$) (Table). However, the median cost of follow-up encounters in the non-operative group was higher at $3,946 compared to $3,338 in the operative group ($p=0.003$). For the 78 (3.1%) patients who were initially managed non-operatively and subsequently underwent follow-up appendectomy, the median cost was an additional $16,348. Based on average costs, non-operative management must therefore succeed 68% of the time to be less costly than operative management.
Conclusion: Non-operative management of uncomplicated appendicitis was associated with higher costs for follow-up encounters and total costs of care that were 70% greater if they eventually underwent follow-up appendectomy. Non-operative management must fail less than 32% of the time to be the less costly strategy.

	Non-operative management				Operative management				p-value
	N	Median	Q1	Q3	N	Median	Q1	Q3	
Cost of index appendicitis encounter ($)	2,464	5,753	2,636	12,857	24,005	15,248	9,967	21,511	<0.001
Cost of follow-up encounters ($)	605	3,946	1,769	12,844	2,890	3,338	1,413	8,507	0.003
Cost of follow-up appendectomy ($)	78	16,348	10,739	21,887					
Cost of all care including follow-up encounters and follow-up appendectomy if applicable	77	26,336	17,090	35,672	24,005	15,778	10,340	22,434	<0.001
Cost of all care including follow-up encounters, without follow-up appendectomy	2,387	6,725	3,091	15,196	24,005	15,778	10,340	22,434	<0.001

Table: Total costs ($ - US dollars) of appendicitis care and additional follow-up visits for patients with incident appendicitis, by index operative management status

Session XV: Quickshot Session II 14-26
Quickshot 17: 9:58 AM – 10:04 AM

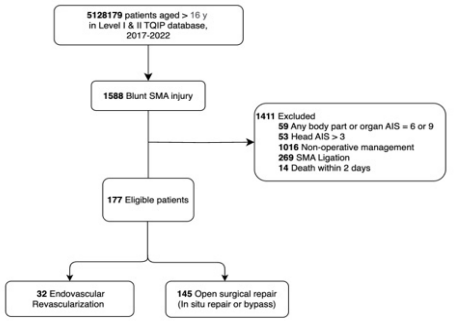
THE METABOLIC PROFILE OF PERITONEAL FLUID FROM TRAUMA PATIENTS UNDERGOING DAMAGE CONTROL LAPAROTOMY (DCL)

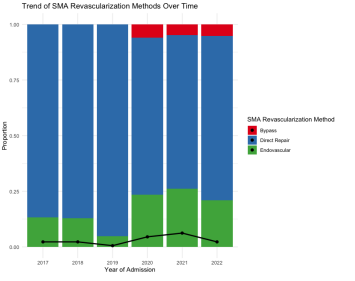
Introduction: Trauma produces unique alterations in the lipidome following injury. Elevated phosphatidylethanolamine levels have been associated with increased critical illness severity in trauma patients. Mechanism of injury (MOI) can also influence outcomes as DCL following blunt trauma is associated with increases mortality and rates of postoperative complications compared to penetrating trauma. Using untargeted lipidomics, we sought to analyze the peritoneal fluid of patients undergoing DCL to identify MOI-specific lipid alterations that may affect inflammatory pathways post-trauma and thus patient outcomes.
Methods: Peritoneal fluid was collected from adult trauma patients who underwent DCL at a Level 1 Trauma Center at the first takeback laparotomy after the index operation. Patients were separated by MOI. Untargeted LC-MS/MS Analysis was performed using a Bruker nanoElute2 System coupled to a timsTOF fleX 2 mass spectrometer. Lipidomic data were processed using mzMine 4.2.0 and it's *in silico* lipid fragment database was analyzed using an R script. Significantly expressed lipids were presented as the log2(fold change). Statistical analysis was performed with Mann-Whitney U test was used to identify significantly expressed lipids ($p < 0.1$).
Results: Overall, 46 peritoneal fluid samples were collected with 29 (63%) from blunt trauma. There were no significant differences in age, sex or mortality between the two groups ($p > 0.05$). Race was significantly different between groups ($p=0.021$). Of the 162 lipids identified, 10 had significantly altered levels. In the blunt trauma group, glycerolipids, sterol lipids and sphingolipids were significantly elevated ($p< 0.1$). In the penetrating group, glycerophospholipids and glycerolipids were significantly elevated ($p< 0.1$).
Conclusion: We applied untargeted lipidomics to peritoneal fluid from patients undergoing DCL. We observed potentially important differences in lipid profiles based on MOI that may influence both local and systemic inflammatory responses in patients with abdominal trauma. Sphingolipid dysregulation may cause profound pro-inflammatory responses and poorer outcomes following blunt trauma. Moreover, alterations in glycerophospholipids can influence outcomes after traumatic brain injuries. Further investigation is warranted into the role lipids may play in patient outcomes following DCL and their potential use as biomarkers of disease.

Session XV: Quickshot Session II 14-26
Quickshot 18: 10:04 AM – 10:10 AM

ENDOVASCULAR VERSUS OPEN REVASCULARIZATION FOR BLUNT SUPERIOR MESENTERIC ARTERY (SMA) INJURY: ANALYSIS OF THE TQIP DATABASE

Introduction: Traumatic superior mesenteric artery (SMA) injury is a rare but catastrophic condition. Prompt revascularization is required to mitigate mortality and morbidity. Given the increasing success of endovascular treatment for SMA thrombosis in non-traumatic mesenteric ischemic disease, the goal of our study is to describe outcomes after endovascular repair as well as nationwide trends in endovascular treatment of blunt traumatic SMA injury.
Methods: This is a retrospective cohort study using the American College of Surgeons Trauma Quality Improvement Program (ACS-TQIP) database. Adult patients with blunt SMA injury presenting between 2017 and 2022 were included. Clinical outcomes including need for intestinal resection after the index operation and in-hospital mortality were described in patients undergoing endovascular SMA repair and compared to outcomes with open repair. A Cochran–Armitage test was used to analyze the trend of endovascular repair in revascularization for blunt SMA injuries over time.
Results: During the 6-year study period, a total of 177 patients met inclusion criteria. The median age was 35 years (interquartile range 27 to 54), and 75.7% were male. The median injury severity score (ISS) was 24 (interquartile range 17 to 29). In-hospital mortality (15.6% vs. 9.7%, p=0.32), need for intestinal resection after index operation (6.3% vs. 18.6%, p = 0.09), and major complications were similar between the endovascular and open surgical repair groups. However, in patients with SMA AIS grade IV injuries, endovascular repair was associated with a greater incidence of acute kidney injury (33.3% vs. 3.8%, P=0.049), fewer ventilator-free days (0 (0-0) vs. 14 (7-19), p=0.010), and fewer ICU-free days (0 (0-0) vs. 7 (1-14), P=0.029), with a nonsignificant trend towards higher mortality (33% vs. 7.7%, P=0.051). During the study period, there was a nonsignificant trend towards increased use of endovascular repair in the overall cohort (range 4.8% to 26.2%, p = 0.080).
Conclusion: Endovascular and open surgical repair demonstrated comparable clinical outcomes in patients with blunt superior mesenteric artery injuries overall. However, endovascular repair of grade IV injuries was associated with poor outcomes.





Session XV: Quickshot Session II 14-26
Quickshot 19: 10:10 AM – 10:16 AM

THORACIC BRANCH ENDOPROSTHESIS AS SAFE ALTERNATIVE THERAPY FOR BLUNT TRAUMATIC AORTIC INJURY REQUIRING ZONE 2 COVERAGE

Introduction: Blunt traumatic aortic injury (BTAI) involving the left subclavian artery (zone 2) poses a challenging problem. Thoracic branch endoprosthesis (TBE) with a left subclavian artery side branch has emerged as a novel tool for thoracic endovascular aortic repair (TEVAR) for injuries requiring a zone 2 seal. We hypothesized that TBE is a non-inferior method for zone 2 BTAI repair.

Methods: The 2017-2022 American College of Surgeons Trauma Quality Programs Participant Use File data were abstracted. Inclusion criteria were adult patients (>16 years old) who had undergone a TBE or TEVAR with an open aortic arch debranching procedure (TEVAR-DB). Patient demographics, complications (stroke, deep venous thrombosis, ventilator associated pneumonia, acute respiratory distress syndrome, surgical site infection, and unplanned return to OR), intensive care unit length of stay (ICU-LOS), and mortality were compared. Wilcoxon signed-rank tests and linear regressions were performed. Significance was defined as $p< 0.05$.

Results: 94 patients met inclusion criteria (TBE: n=61 and TEVAR-DB: n=33). There was no difference in gender, age, or ISS between the groups. The TBE group had a significantly lower GCS on presentation (TBE: 10.8 ± 5.2 vs TEVAR-DB: 13.0 ± 4.1, $p=0.04$). Additionally, there was a non-significant difference in complications including stroke rate (TBE: 1.6% vs TEVAR-DB: 0%, $p=1.0$), ICU-LOS, and mortality between the groups. On multivariate analysis, a significant association was not present between procedure type and stroke rate, ICU-LOS, or mortality.

Conclusions: TBE is non-inferior to TEVAR-DB for the treatment of BTAI requiring a zone 2 seal. In the appropriate patient population, it may demonstrate a less invasive treatment alternative.

Session XV: Quickshot Session II 14-26
Quickshot 20: 10:16 AM – 10:22 AM

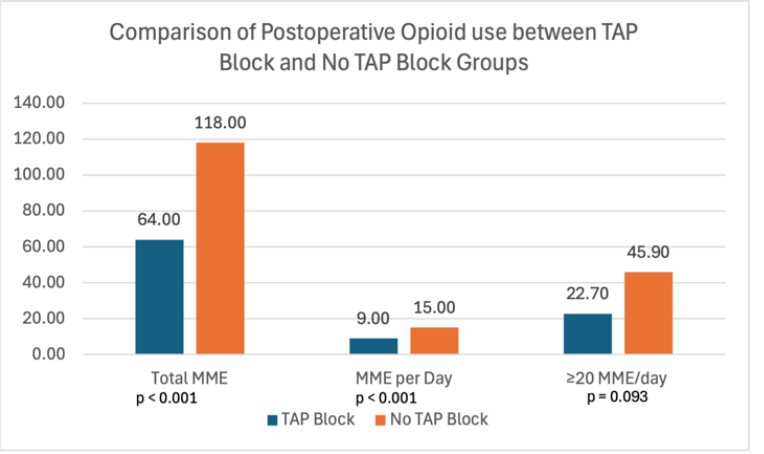
"ALL IN GOOD TIME" - THE LIBERAL UTILIZATION OF TEMPORARY INTRAVASCULAR SHUNTING BY TRAUMA SURGEONS TO IMPROVE RESOURCE UTILIZATION IS SAFE AND EFFECTIVE FOR PENETRATING PERIPHERAL VASCULAR TRAUMA

Introduction*:* Temporary Intravascular Shunting (TIVS) is well described in peripheral vascular trauma but has previously been reserved primarily for patients requiring orthopedic fixation or damage control. Our institution began utilizing TIVS liberally due to resource constraints, especially overnight. We hypothesize that utilizing TIVS to address resource constraints in busy trauma centers is not inferior to immediate repair.
Methods*:* An urban Level 1 trauma center registry was queried for peripheral arterial injuries due to penetrating mechanisms (5/2018-8/2024). Patients were categorized as undergoing immediate repair (ImR) vs TIVS placement for damage control with subsequent repair (DC). Within the DC group, those who received ≤6 units pRBC intraoperatively, had a final intraoperative lactate < 5.0 and had no other cavity explored were categorized into the resource utilization subgroup (DC-RU). ImR patients were compared to the DC group overall and to the DC-RU subgroup.
Results*:* Of 230 patients included, 123 were in the ImR group and 107 in the DC group, of which 44 were in the DC_RU subgroup. Trauma surgeons performed 91/123 of the repairs in the ImR group, 106/107 of the TIVS and 104/107 of the definitive repairs in the DC group. Mean shunt dwell time was 23.9 hrs in the DC group and 18.5 hrs in the DC-RU group. When comparing ImR to DC, there was no difference in vascular complications requiring reoperation (22.0% vs 30.1% p=0.17), post-op compartment syndrome (6.5% vs 7.5% p=0.98), amputation (2.4% vs 3.7% p=0.71) or mortality (0.8% vs 3.7% p=0.19). Similarly, when comparing ImR to DC-RU, there was no difference in vascular complications requiring reoperation (22.0% vs 13.6% p=0.33), post-op compartment syndrome (6.5% vs 2.3% p=0.44), amputation (2.4% vs 0% p=0.57) or mortality (0.8% vs 0% p=1).
Conclusion: TIVS to improve resource utilization appears to be safe for managing penetrating peripheral arterial injuries when both shunting and definitive repair are performed by trauma surgeons.

Session XV: Quickshot Session II 14-26
Quickshot 21: 10:22 AM – 10:28 AM

UTILITY OF TRANSVERSUS ABDOMINIS PLANE BLOCK IN TRAUMA AND EMERGENCY GENERAL SURGERY LAPAROTOMY: A QUALITY IMPROVEMENT PROJECT

Introduction: Transversus abdominis plane (TAP) blocks reduce opioid use and improve outcomes in elective surgeries, but their role in acute care surgery remains unknown. Our program recently developed a quality improvement project to implement a pain management protocol including TAP blocks for emergency laparotomy. The purpose of this study is to evaluate the impact of TAP blocks on opioid use and hospital outcomes.
Methods: This is a retrospective cohort study (2022-24) including patients (age ≥18 years) who underwent an emergency laparotomy. Patients were divided into TAP block and no TAP block cohorts. Univariate and multivariate analyses were performed to assess the association between the use of TAP blocks and study outcomes including postoperative morphine milligram equivalents (MME) and postoperative complications.
Results: Among 219 patients (110 TAP block, 109 no TAP block), those receiving TAP blocks required significantly less total MME (64 vs. 118, p= 0.009), daily MME (9 vs. 15, p< 0.001) and were less likely to require ≥20 MME/day (22.7 % vs. 45.9%, p< 0.001). No significant differences were observed in postoperative complications. Multivariate analysis showed the use of TAP block was associated with decreased odds of requiring ≥20 MME/day (aOR: 0.363, 95% CI: 0.195-0.675, p=0.001), and less MME per day (β = -14.52, 95% CI: -27.50 to -1.53, p = 0.029). (Figure)
Conclusion: TAP blocks significantly reduced opioid use in trauma and emergency general surgery patients. While further research is warranted, TAP blocks should be considered for the postoperative pain management.



Session XV: Quickshot Session II 14-26
Quickshot 22: 10:28 AM – 10:34 AM

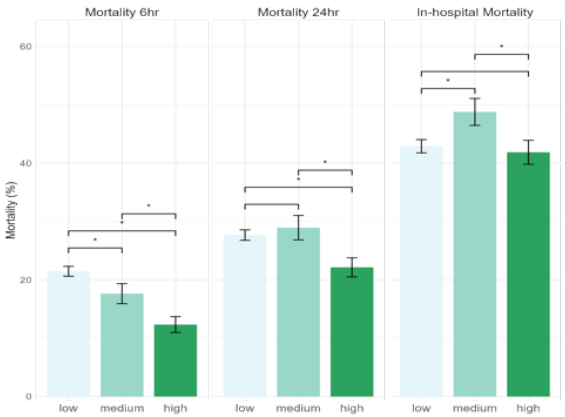
PRIMARY CARE ACCESS IS ASSOCIATED WITH IMPROVED LONG-TERM SURVIVAL AFTER SEVERE TRAUMATIC INJURY

Introduction: Survivors of severe traumatic injury remain at elevated risk of death in the years after injury. Little is known about how long-term mortality among injury survivors can be reduced. Given the importance of primary care to overall health, we hypothesized that primary care access among survivors would be associated with improved long-term survival.
Methods: This population-based, retrospective cohort study (2010–2022) included adults (age ≥ 18 years) discharged alive after severe injury (ISS > 15). The exposure of interest was primary care access, defined as either visiting or being enrolled with a primary care provider in the two years prior to injury. The primary outcome was five-year all-cause mortality. Cox proportional hazards models were used to evaluate the relationship between primary care access and mortality, adjusting for sociodemographics, comorbidity, and injury severity.
Results: We identified 25,713 survivors of severe injury (mean age 54 years, 32% female), of whom 92% (n=23,720) had primary care access. Five-year mortality was 13% (n=3,265 patients). Adjusting for patient characteristics, primary care access was associated with a 20% lower hazard of death (HR 0.80, 95% CI 0.68–0.93) at five years. The relationship between primary care access and mortality was preserved across subgroups of age, sex, and comorbidity.
Conclusion: Survivors of severe traumatic injury without primary care access were more likely to die in the five years after discharge, identifying a vulnerable subset of the survivor population. Primary care physicians may represent key partners to trauma care providers in developing strategies that improve long-term outcomes in the years after injury.

Session XV: Quickshot Session II 14-26
Quickshot 23: 10:34 AM – 10:40 AM

DON'T FORGET THE CRYOPRECIPITATE: THE IMPACT OF THE 2019 JOINT TRAUMA SYSTEM DAMAGE CONTROL RESUSUCITATION CLINICAL PRACTICE GUIDELINE ON MORTALITY

Introduction: Transfusion of plasma (FFP) & platelets (PLTs) to packed red blood cells (PRBCs) in a 1:1 ratio is well established; however, the ratio of cryoprecipitate (CRYO) to PRBC is not. The Joint Trauma System (JTS) updated its 2019 Damage Control Resuscitation guideline by adding 1:1 CRYO: PRBCs to their ratios. We hypothesized that those within CRYO: PRBC guideline range (high ratio) would have a reduction in mortality.
Methods: We included adult patients in Trauma Quality Improvement Program (2013-2021) who received at least 5u PRBCs/4-h & 1-u of FFP. Dying within ½-h, non-survivable injury patterns, pre-existing coagulopathy, advanced directives, transfers, & burns were excluded. Patients were partitioned into high (≥1:1), med. (≥1:2 to < 1:1), & low (< 1:2) CRYO:PRBC ratios. Treatment effects were estimated with propensity score-weighted risk adjustment models, clustering by center. Primary outcome was 6-h mortality. Secondary outcomes included 24-h & in-patient mortality. Exploratory analysis was performed on the potential mediators: FFP, PLTs & whole blood.
Results: 48,673 patients (5221 high; 3577 med; 39875 low). Mean age was 39, 79% were male, 58% blunt & mean injury severity score was 29. Unadjusted 6-h mortality was 11.8%, 18.8%, 21.3% for high, med. & low. High was protective at hours 6 [aOR 0.52,0.45-0.58] & 24 [aOR 0.74,0.67-0.82] & med. was protective at hour 6 [aOR 0.78,0.70-0.87]. High was protective compared to med. at all endpoints (Figure). Exploratory analysis demonstrated that high & med. were protective of 6-h, 24-h & in-patient mortality.
Conclusion: JTS high CRYO guideline ratios were associated with decreased mortality during the first 24-hs. Future randomized trials are warranted.



Session XV: Quickshot Session II 14-26
Quickshot 24: 10:40 AM – 10:46 AM

TRAUMA AND EMERGENCY SURGICAL CARE AT FACILITIES ELIGIBLE FOR RURAL EMERGENCY HOSPITAL DESIGNATION.

Introduction: Timely access to emergency surgical care is a key metric for health system development and performance. To mitigate the risks of rural hospital closures in the US, the 2021 Consolidated Appropriations Act introduced the Rural Emergency Hospital (REH) designation, which promotes closure of inpatient units in small hospitals in favor of emergency and outpatient services by providing supplemental funding and enhanced reimbursement. We investigated trauma and emergency general surgery (EGS) volumes at REH-eligible hospitals across states to evaluate the potential impact of REH designation on trauma and EGS care.
Methods: We used the 2021 Healthcare Cost and Utilization Project from five geographically diverse states (CA, FL, IA, MD, WI) to identify encounters where adult patients were treated for acute injuries or EGS conditions. We identified REH-eligible hospitals (i.e. critical access hospitals or rural hospitals with < 50 inpatient beds). We compared case volumes and patient populations at REH-eligible and -ineligible hospitals.
Results: We analyzed 2.1 million encounters. Trauma and EGS encounters at REH-eligible hospitals comprised between 2 (MD) and 37% (IA) of statewide hospitalizations and between < 1 and 14% of statewide inpatient days. Compared with ineligible facilities, REH-eligible facilities treated a higher share of patients who were white (86 vs. 55%), living in rural areas (69 vs. 6%), and had lower incomes; treated fewer patients operatively (2 vs. 10%); and transferred more patients (5 vs. 3%) (all $p < 0.001$).
Conclusion: Hospitals eligible for REH designation contribute substantially to the care of injured and EGS patients, though this is variable across states. While this policy may sustain emergency services in rural areas, but its effects on trauma and EGS care—particularly regarding surgical access, patient transfers, and system-wide capacity—remain uncertain and warrant urgent evaluation.

Session XV: Quickshot Session II 14-26
Quickshot 25: 10:46 AM – 10:52 AM

ASSESSMENT OF PREHOSPITAL AIRWAY MANAGEMENT IN THE SETTING OF TRAUMA: AN AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA MULTICENTER STUDY

Introduction: Prehospital endotracheal intubation (EMS-ETI) in the setting of trauma is highly contested. We hypothesized EMS-ETI patients would have longer scene times and increased risk of mortality.

Methods: We conducted a retrospective (2019-2022), multicenter study across 27 trauma centers comparing EMS-ETI to those intubated within 10 minutes of ED arrival (ED-ETI) without EMS-ETI attempted. Inclusion criteria included patients transported by paramedics in ground ambulances. Patients suffering cardiac arrest in the field and pronounced dead within 10 minutes of ED arrival were excluded. One-to-one nearest neighbor propensity score matching (PSM) was employed to compare EMS-ETI to ED-ETI.

Results: Of 1505 included patients: 1022 (68%) were ED-ETI and 483 (32%) EMS-ETI. Unmatched ETI patients had increased time at scene (15 vs 10 minutes), traveled farther to a trauma center (6.8 vs. 5.2 miles), had worse initial GCS (3 vs. 5), and more prehospital procedures (9 vs. 6) and cardiac arrests (15.7% vs. 11.4%) compared to ED-ETI patients (all $p < 0.05$). EMS-ETI patients also more often died during their index hospitalization (57.3% vs. 49.5%, $p < 0.05$). After matching 312 patients for mileage, prehospital GCS, cardiac arrest in the field, and number of prehospital procedures, the difference in scene time remained unchanged (15 vs 10 minutes, $p < 0.05$). There were no significant differences in prehospital vital signs. The majority of EMS-ETI attempts had first-pass success with a median of one attempt (IQR 1, 1). Notably, in contrast to unmatched observations, the EMS-ETI cohort had decreased in hospital mortality (50.3% vs. 63.8% p=0.001). However, the associated odds of mortality increased 74% with each unsuccessful EMS-ETI attempt (OR 1.74, 95% CI 1.19, 2.64, p=0.005).

Conclusion: This multicenter study demonstrated that after PSM, EMS-ETI patients had increased scene times, but decreased mortality compared to ED-ETI patients. Although, failed first pass EMS-ETI was associated with increased mortality. Overall suggesting EMS-ETI may be helpful if first pass ETI can be achieved.

	Unmatched			
	Overall	ED Intubations	EMS Intubations	p
n	1505	1022	483	
Age (median [IQR])	38.00 [26.00, 56.00]	37.00 [26.00, 55.00]	41.00 [29.00, 58.00]	0.017
Male (%)	1166 [77.6]	798 [78.2]	368 [76.2]	0.411
Race/Ethnicity (%)				0.289
White	907 [60.6]	615 [60.5]	292 [60.7]	
Hispanic	141 [9.4]	87 [8.6]	54 [11.2]	
Black	335 [22.4]	241 [23.7]	94 [19.5]	
Asian	30 [2.0]	19 [1.9]	11 [2.3]	
Other	30 [2.0]	18 [1.8]	12 [2.5]	
Unknown	54 [3.6]	36 [3.5]	18 [3.7]	
Injury Type (%)				0.047
Assault	36 [2.4]	24 [2.3]	12 [2.5]	
ATV	6 [0.4]	6 [0.6]	0 [0.0]	
AutoPed	180 [12.0]	122 [11.9]	58 [12.0]	
BicycleAccident	27 [1.8]	18 [1.8]	9 [1.9]	
Fall	277 [18.4]	168 [16.4]	109 [22.6]	
GSW	330 [21.9]	224 [21.9]	106 [21.9]	
Motorcycle	115 [7.6]	81 [7.9]	34 [7.0]	
MVA	364 [24.2]	264 [25.8]	100 [20.7]	
Other	61 [4.1]	37 [3.6]	24 [5.0]	
Stabbing	46 [3.1]	37 [3.6]	9 [1.9]	
Unknown	63 [4.2]	41 [4.0]	22 [4.6]	
Response Time (median [IQR])	6.00 [4.00, 8.00]	6.00 [4.00, 8.00]	6.00 [4.00, 9.00]	0.022
Scene Time (median [IQR])	11.00 [7.00, 17.00]	10.00 [7.00, 14.00]	15.00 [10.00, 24.00]	<0.001
Transport Time (median [IQR])	12.00 [8.00, 17.00]	11.00 [8.00, 16.00]	13.00 [9.00, 18.00]	<0.001
Total Field Time (median [IQR])	30.00 [23.00, 40.00]	28.00 [22.00, 36.00]	36.00 [29.00, 47.00]	<0.001
Scene Delay (%)	197 [13.1]	129 [12.6]	68 [14.1]	0.484
Mileage (median [IQR])	5.70 [3.00, 10.40]	5.20 [2.70, 10.00]	6.80 [3.50, 11.20]	0.001
EMS GCS (median [IQR])	3.00 [3.00, 5.00]	5.00 [3.00, 11.00]	3.00 [3.00, 6.00]	<0.001
EMS SBP (median [IQR])	123.00 [88.00, 146.75]	125.00 [90.00, 148.00]	120.00 [80.00, 144.00]	0.107
EMS Pulse (median [IQR])	90.00 [64.00, 112.00]	90.00 [66.00, 114.00]	88.00 [60.00, 110.00]	0.065
EMS Arrest Prior to Arrival (%)	192 [12.8]	116 [11.4]	76 [15.7]	0.022
EMS Arrest After Arrival (%)	206 [13.7]	105 [10.3]	101 [20.9]	<0.001
EMS Airway Procedures				
BVM (%)	945 [63.6]	535 [53.0]	410 [86.3]	<0.001
NPA (%)	168 [11.4]	128 [12.7]	40 [8.5]	0.022
OPA (%)	298 [20.2]	210 [20.8]	88 [18.8]	0.394
SGA (%)	162 [10.9]	149 [14.7]	13 [2.8]	<0.001
Suction (%)	381 [25.3]	190 [18.6]	191 [39.5]	<0.001
RSI (%)	285 [59.6]	0 [NaN]	285 [59.6]	NaN
EMS Intubation Attempts (median [IQR])	0.00 [0.00, 1.00]	0.00 [0.00, 0.00]	1.00 [1.00, 1.00]	<0.001
EMS Procedures (median [IQR])	7.00 [5.00, 9.00]	6.00 [4.00, 7.00]	9.00 [7.00, 10.00]	<0.001
Mortality (%)	783 [52.0]	506 [49.5]	277 [57.3]	0.005

	Matched			
	ED Intubations	EMS Intubations	p	SMD
n	312	312		
Age (median [IQR])	39.00 [26.00, 57.00]	41.00 [29.00, 56.00]	0.107	0.055
Male (%)	0.77 (0.42)	0.75 (0.44)	0.514	0.052
Race/Ethnicity (%)			0.088	0.251
White	202 [65.2]	188 [60.6]		
Hispanic	17 [5.5]	39 [12.6]		
Black	68 [21.9]	61 [19.7]		
Asian	8 [2.6]	7 [2.3]		
Other	6 [1.9]	6 [1.9]		
Unknown	9 [2.9]	9 [2.9]		
Injury Type (%)			0.88	0.183
Assault	7 [2.2]	8 [2.6]		
ATV	1 [0.3]	0 [0.0]		
AutoPed	40 [12.8]	39 [12.5]		
BicycleAccident	8 [2.6]	6 [1.9]		
Fall	56 [17.9]	71 [22.8]		
GSW	73 [23.4]	67 [21.5]		
Motorcycle	24 [7.7]	24 [7.7]		
MVA	77 [24.7]	70 [22.4]		
Other	10 [3.2]	11 [3.5]		
Stabbing	6 [1.9]	3 [1.0]		
Unknown	10 [3.2]	13 [4.2]		
Response Time (median [IQR])	5.00 [4.00, 8.00]	6.00 [4.00, 9.00]	0.064	0.15
Scene Time (median [IQR])	10.00 [7.00, 16.00]	15.00 [9.00, 23.00]	<0.001	0.582
Transport Time (median [IQR])	12.00 [9.00, 17.00]	13.00 [9.00, 18.00]	0.031	0.215
Total Field Time (median [IQR])	30.00 [23.00, 37.25]	35.00 [28.75, 47.25]	<0.001	0.575
Scene Delay (%)	46 [14.7]	46 [14.7]	1	<0.001
Mileage (median [IQR])	6.75 [3.98, 11.17]	6.85 [3.60, 11.50]	0.935	0.029
EMS GCS (median [IQR])	3.00 [3.00, 7.00]	3.00 [3.00, 7.00]	0.453	0.078
EMS SBP (median [IQR])	125.50 [90.00, 150.00]	125.00 [90.00, 147.00]	0.453	0.064
EMS Pulse (median [IQR])	90.00 [70.00, 115.00]	90.00 [72.75, 113.00]	0.529	0.055
EMS Arrest Prior to Arrival (%)	0 [0.0]	0 [0.0]	NaN	<0.001
EMS Arrest After Arrival (%)	66 [21.2]	68 [21.8]	0.922	0.016
EMS Airway Procedures				
BVM (%)	235 [75.0]	252 [82.6]	0.047	0.169
NPA (%)	70 [22.8]	25 [8.2]	<0.001	0.411
OPA (%)	93 [30.2]	41 [13.6]	<0.001	0.41
SGA (%)	68 [21.8]	6 [2.0]	<0.001	0.643
Suction (%)	84 [26.9]	124 [39.7]	0.001	0.275
RSI (%)	0 [NaN]	203 [65.7]	NaN	NaN
EMS Intubation Attempts (median [IQR])	0.00 [0.00, 0.00]	1.00 [1.00, 1.00]	<0.001	3.975
EMS Procedures (median [IQR])	8.00 [6.00, 9.00]	8.00 [7.00, 9.00]	0.085	0.149
Mortality (%)	199 [63.8]	157 [50.3]	0.001	0.274

Session XV: Quickshot Session II 14-26
Quickshot 26: 10:52 AM – 10:58 AM

IMPACT OF YOGA INTERVENTION ON FUNCTIONAL ASSESSMENT AND QUALITY OF LIFE IN PELVIC INJURIES PATIENTS -A RANDOMIZED CONTROLLED TRIAL

Introduction: *Yoga* as an additional therapy has shown positive impact on physical capabilities and on behavioral changes in chronic diseases as well as in chest trauma patients. The evidence regarding its role in rehabilitation of non-operatively managed pelvic injury patients is lacking.
Material and methods: This randomized controlled trial was conducted at level-1 Trauma Centre. Non operatively managed pelvic injury patients were randomized into either standard physiotherapy or *Yogatherapy* groups. Patients in physiotherapy group received conventional physiotherapy and *Yogatherapy* group received a set of *Yogic* exercises in addition to conventional physiotherapy at various time points up to 12 weeks. Primary outcome was effect on Majeed score and various muscles functioning, and secondary outcomes were effect on pain, and quality of life (QoL) measured at 4-week, 8 week and 12 weeks using WHOQOL -BREF and PROMIS inventory.
Results: A total of 103 eligible patients were randomized to physiotherapy ($n = 52$) and *Yoga* therapy ($n = 51$) groups and included in Intension to treat analysis (ITT). Per protocol (PP) analysis was having 41 and 38 patients respectively. Demographic characteristics and injuries profiles were comparable in both the groups. PP showed change in Majeed score at 12 weeks in *Yoga* therapy group was statistically significant (0.03), while muscle function improvement was more in physiotherapy group at 4 week and 12 weeks. There was statistically significant improvement in Yoga group at week 12 in Physical domain ($p=0.05$), Psychological domain ($p=0.04$) and pain score.
Conclusion: *Yoga* was found to be effective in improving functional assessment and QoL in non-operatively managed pelvic injury patients.