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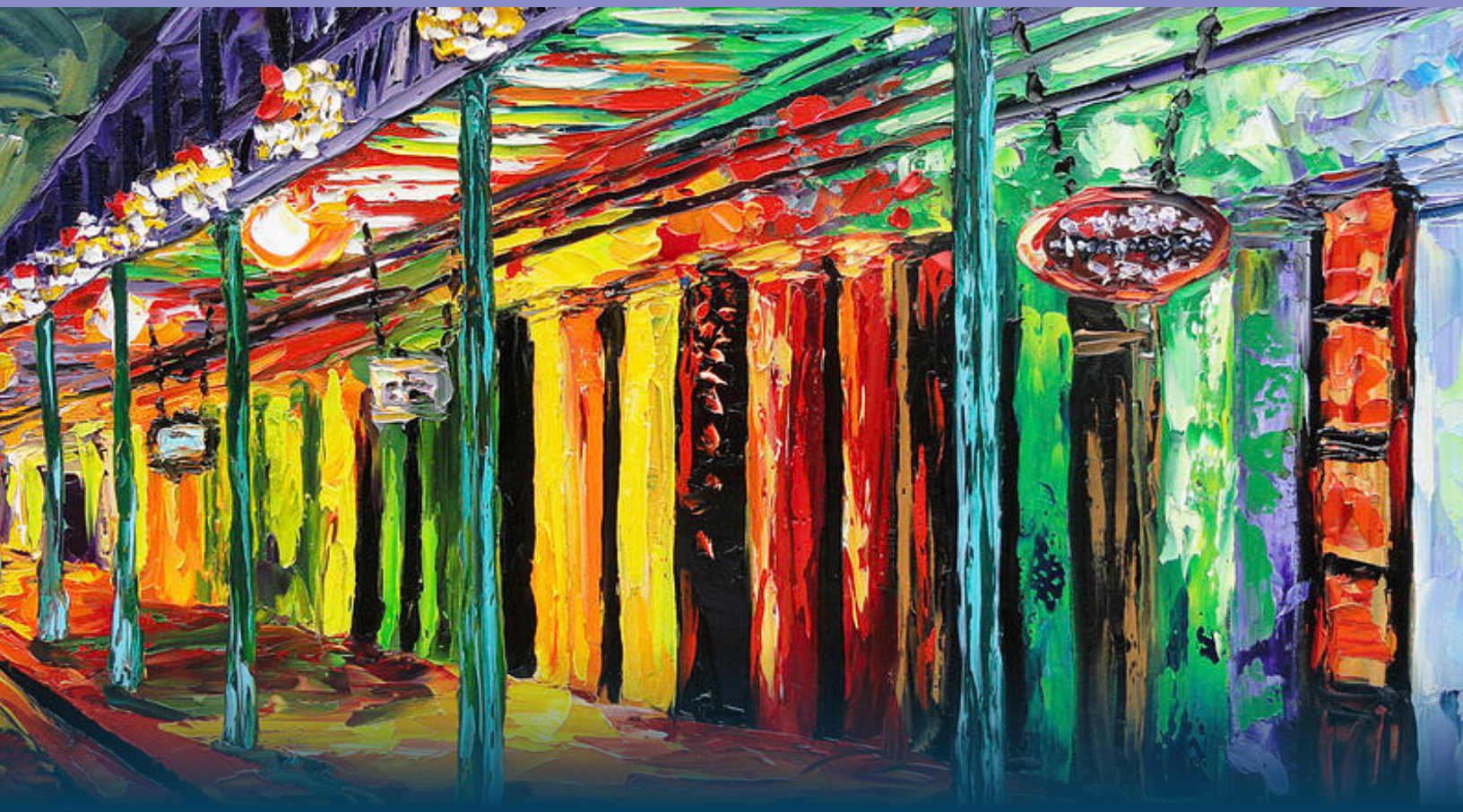


LOUISIANA CHAPTER
ACS 74TH ANNUAL MEETING

RENAISSANCE NEW ORLEANS ARTS WAREHOUSE DISTRICT HOTEL

ePoster #27 | Abstract | Clinical Science | Trauma/Burn/Critical Care

Borders in US Trauma Care: Outcome Disparities Among Migrant Workers, Undocumented, and Citizens

S Kim, X. Zhang, D Tahan, Z Zhang, D Tatum, K Harrell, J Zhang, R Reily, J Duchesne, S Taghavi,

Background: Migrant worker and undocumented citizen (MWUC) trauma patients face socioeconomic marginalization and healthcare disparities, yet existing research is limited to single institutions and regions.

Objective: We evaluated differences in clinical outcomes between MWUC and US-citizen trauma patients using national ACS TQIP data.

Methods: This retrospective cohort study analyzed 2021-2022 ACS TQIP data comparing adult MWUC and US-citizen trauma patients. MWUC status was defined by alternate home residence variable. Primary outcome was in-hospital mortality; secondary outcomes included hospital length of stay (LOS), ICU LOS, and ventilator days. Propensity score matching (1:1) balanced groups (n=1,908 each) on age, sex, injury severity score (ISS), trauma mechanism, and traumatic brain injury (TBI) severity. Multivariate logistic regression adjusted for sociodemographic and clinical covariates.

Results: MWUCs were predominantly Hispanic/Latino (80.7% vs. 23.2%, $p<0.001$) with more falls (64.2% vs. 26.3%, $p<0.001$) and fewer motor vehicle injuries (14.6% vs. 37.5%, $p<0.001$). Payer methods differed significantly ($p<0.001$): MWUCs more often paid out-of-pocket (30.0% vs. 17.5%) or used government programs (44.7% vs. 4.6%). MWUCs were more frequently admitted to floor beds (47.6% vs. 40.2%) or ICUs (19.5% vs. 14.2%) and less often discharged home (7.7% vs. 11.4%, $p<0.001$). MWUCs experienced higher in-hospital mortality (2.9% vs. 1.8%, $p=0.028$), longer hospital LOS (9.4 vs. 5.6 days, $p<0.001$), ICU LOS (1.6 vs. 1.2 days, $p=0.006$), and ventilator days (0.9 vs. 0.5 days, $p=0.008$). Multivariate analysis showed MWUC status independently associated with increased mortality (OR 2.26, $p=0.011$).

Conclusion: Despite comparable injury severity, MWUCs experienced significantly higher mortality and healthcare resource utilization, highlighting systemic disparities requiring targeted interventions.

ePoster #28 | Abstract | Clinical Science | Trauma/Burn/Critical Care

Reassessing Disparities Using TQIP: Sociodemographic Influences and Time to Surgery in Traumatic Hemoperitoneum With Hypotension

Z Zhang, D Tahan, X Zhang, A Al-Shammari, S Tahhan, D Tatum, K Harrell, J Zhang, R Reily, C McGinness, S Taghavi, Tulane School of Medicine

Background: Hemoperitoneum is a surgical emergency that requires timely intervention. The impact of sociodemographic factors on time to surgery in high-acuity trauma remains unclear.

Objective: We aimed to assess whether race, insurance status, and socioeconomic background are associated with time from admission to operative intervention in adults with traumatic hemoperitoneum.

Methods: This retrospective cohort study used 2021–2023 ACS Trauma Quality Improvement Program data to identify adult patients who underwent operative management for traumatic hemoperitoneum with systolic blood pressure ≤ 100 mmHg. The primary outcome was the time to the operating room (OR), defined as the interval from hospital arrival to OR arrival. Baseline cohort characteristics were summarized descriptively, and multivariable linear regression was used to assess associations between sociodemographic variables—including age, sex, race/ethnicity, residence status, and primary payment method.

Results: A total of 3,699 patients were included. Female sex was associated with a 25.2% longer time to surgery compared to males ($p<0.01$). Black and Hispanic patients experienced shorter times to OR compared to White patients ($p<0.01$). Patients without a private residence had 15.6% longer times to OR ($p=0.02$). Patients with private insurance had a 16.8% longer time to OR compared to government-insured patients ($p<0.01$), while those with other/unknown payment methods had shorter times ($p<0.01$).

Conclusion: Female patients and patients without a private residence experienced longer delays to the OR, suggesting disparities exist with time to hemorrhage control. Future work should clarify these mechanisms and guide targeted interventions to ensure equitable, timely surgical care.

	log(time to surgery for hemorrhage control in minutes + 1)			
Predictors	*Estimates*	*% change*	*95% CI for % change*	*p*
Intercept	3.69	–	–	**<0.01**
Age in Years	0.00	0.38	0.22 – 0.54	**<0.01**
Sex = Female	0.22	25.21	17.82 – 33.06	**<0.01**
Race = Black	-0.22	-19.95	-24.76 – -14.82	**<0.01**
Race = Other	0.08	8.57	0.22 – 17.61	**0.04**
Race = Unknown	0.01	1.11	-16.87 – 22.96	0.91
Hispanic or Latino	-0.14	-13.21	-19.38 – -6.57	**<0.01**
No private residence	0.15	15.62	2.46 – 30.48	**0.02**
Private primary method of payment	0.16	16.79	9.73 – 24.30	**<0.01**
Other/Unknown primary method of payment	-0.11	-10.01	-15.56 – -4.10	**<0.01**
Abdomen AIS severity	-0.07	-6.99	-9.36 – -4.57	**<0.01**
GCS	0.03	2.62	2.10 – 3.14	**<0.01**
Observations	3699			

ePoster #29 | Abstract | Clinical Science | Trauma/Burn/Critical Care

FRESH FROZEN PLASMA MAY DECREASE LEVELS OF ENDOTHELIAL DYSFUNCTION IN BURN INJURY PATIENTS

A Mermilliod, C Ramos, D Vitharana, AR Masoud, K Andre, C Leonardi, M Miles, J Carter, J Schoen, A Smith,

Background: Fresh frozen plasma (FFP) is given to patients with high total body surface area (TBSA) burns as an adjunctive colloid during burn resuscitation. FFP may reduce endothelial dysfunction associated with high-TBSA burns by changing the patient's inflammatory state through cytokine levels released by adipose-derived stem cells (ADSCs), specifically VEGF-A. VEGF-A plays a role in angiogenesis by increasing inflammatory cell infiltration and endothelial dysfunction.

Objective: This study aimed to investigate a benefit of FFP on VEGF-A levels in burn patients.

Methods: Adipose tissue was collected from adult patients with full-thickness burns during post-injury surgery, median four days following injury. ADSCs were isolated from tissue by trypsin enzyme digestion. Fluorescence-activated single-cell sorting (FACS) of ADSCs was performed to determine purity with CD105, CD90, and CD73 antibodies. ADSCs were grown under standard tissue culture conditions, and supernatant was collected for cytokine analysis. Data were analyzed using Spearman correlation of VEGF-A levels and FFP amount received.

Results: Fourteen patients receiving FFP within 36 hours of injury and three patients not receiving FFP were enrolled. FFP volumes given to the 14 patients ranged from 258-3186mL, with an average of 1465715mL. Average TBSA was 3524% with average age of 5617 years. Though statistical analysis demonstrated a moderately strong negative correlation between VEGF-A and FFP (Spearman correlation coefficient was -0.458), this correlation was not statistically significant (p=0.064).

Conclusion: Patients who received increased FFP were correlated with lower VEGF-A, indicating a possible correlation between high-dose FFP and decreased endothelial dysfunction. Future studies with increased sample size are required to investigate this finding.

ePoster #30 | Abstract | Clinical Science | Trauma/Burn/Critical Care

Risk Factors for Ventilator Associated Pneumonia in Trauma Intensive Care Unit Patients

A Mortemore, P Balaraman, McGee E, D Tatum, J Zhang, S Taghavi, C McGinness, K Harrell,,

Background: Ventilator associated pneumonia (VAP) is a common hospital acquired infection. Trauma patients with aspiration, rib fractures, traumatic brain injuries (TBI), pulmonary contusions, and systemic inflammatory response may have unique predispositions for VAP from a general ICU population.

Objective: The aim of this study was to identify trauma-related risk factors for VAP. We hypothesize that traumatic injuries will increase the risk of VAP more than longer duration of ventilation.

Methods: A retrospective analysis of intubated trauma patients was conducted from 2019 through 2023. VAP was defined as ≥104 colony forming units grown on respiratory culture after at least two ventilator days. VAP patients were compared to no VAP patients and a multivariable logistic regression analysis was performed to identify VAP risk factors.

Results: Over the 5-year period, 980 patients met inclusion criteria with 233 (24%) developing VAP. Patients were diagnosed with VAP a median of 7 days after intubation. VAP patients had more blunt injury (77% vs. 70%, $p=0.003$), pulmonary contusions (25% vs. 15%, $p<0.001$), and TBI (61% vs. 47%, $p<0.001$) compared to no VAP patients. Patient history of smoking and chronic pulmonary disease was not different between the groups. VAP patients had higher median ventilator days (14 vs. 4 days, $p<0.001$) and hospital length of stay (29 vs. 15 days, $p<0.001$). When controlling for age, sex, injury severity, and pulmonary contusion on multivariable logistic regression, TBI (OR 1.71), rib fractures (OR 1.53), aspiration (OR 2.30), and increased ventilator days (OR 1.12) were independently associated with an increased odds of VAP development.

Conclusion: Traumatic injuries and aspiration were associated with higher increased odds of VAP development than increased ventilation duration. Definitions and interventions for VAP in trauma patients need to consider the different physiology and risk factors for pulmonary infection in this population.

ePoster #31 | Abstract | Clinical Science | Trauma/Burn/Critical Care

Trends in Prehospital Trauma: Needle Decompression versus Blood Administration

I Ifearulundu, E Lacy, G Gianfrate, D Scarboro, A Scheuermann, P Greiffenstein, A Marr, L Stuke, J Hunt, A Smith,

Background: Prehospital thoracic needle decompression and blood transfusions are both lifesaving interventions with significant improvement in the survival outcomes of trauma patients, although recent changes in trends and relationships of prehospital interventions over time are limited.

Objective: This study aimed to evaluate the effects of prehospital blood administration on the rate of prehospital thoracentesis in the trauma population.

Methods: This retrospective cohort study utilized the Trauma Registry data of a single, ACS-verified, level one trauma center from 2016 to 2025. Adult trauma patients were stratified by prehospital intervention of blood administration or thoracic needle decompression. Annual frequencies and percentage trends were compared between the groups.

Results: The study included 38,884 trauma patients. A total of 1,146 (2.95%) prehospital interventions were performed, with 1.51% (n=587) of patients receiving needle decompression, compared to 1.44% (n=559) receiving blood. The average rate of prehospital needle decompression among trauma patients was 1.47%, while the average rate of prehospital blood administration was 1.69%. Prehospital needle decompression was most performed in 2020, at a rate of 2.18% (n=90/4,136). In 2023, prehospital blood administration was most performed at a rate of 3.13% (n=137/4,374). Prehospital needle decompression decreased annually from 2.18% in 2020 to less than one percent, annually in 2024. The rate of prehospital blood administration has significantly increased since 2020 and is being performed more often than needle decompression (2024; ND=0.97%, PB=2.72%).

Conclusion: This single-center study showed annual prehospital thoracentesis needle decompression rates decreasing among trauma patients, while prehospital blood administration showed a significant increase during a similar period. Further comparison, including patient factors, injury details, and outcomes between those undergoing prehospital interventions such as needle decompression and blood administration, is essential to optimize patient care of this critically ill population.

Table 1. Prehospital Needle Decompression versus Blood Administration, Trauma Registry Single ACS Level 1 Trauma Center, 2016 – 2025

		Needle Decompression		Blood Administration		Total	
Year	**Patients (n)**	**n**	**%**	**n**	**%**	**n**	**%**
2016	2,890	45	1.56	-	-	45	1.56
2017	3,505	41	1.17	-	-	41	1.17
2018	3,774	56	1.48	4	0.11	60	1.59
2019	4,124	72	1.75	15	0.36	87	2.11
2020	4,136	90	2.18	32	0.77	122	2.95
2021	4,701	95	2.02	66	1.40	161	3.42
2022	4,639	65	1.40	143	3.08	208	4.48
2023	4,374	67	1.53	137	3.13	204	4.66
2024	4,124	40	0.97	112	2.72	152	3.69
*2025**	*2,617*	*16*	*0.61*	*50*	*1.91*	66	2.52
Total (Avg)	38,884	587	1.51 (1.47)	559	1.44 (1.67)	1,146	2.95 (2.82)

**Data from January to August of 2025*

ePoster #32 | Abstract | Clinical Science | Trauma/Burn/Critical Care

When Surgery Waits: How Sociodemographic Factors Influence SSRF Timing in Rib Fracture Patients

Z Zhang, D Tahan, X Zhang, A Al-Shammari, N Lim, D Tatum, K Harrell, J Zhang, R Reily, C McGinness, S Taghavi, Tulane School of Medicine

Background: The Chest Wall Injury Society (CWIS) recommends performing surgical stabilization of rib fractures (SSRF) for non-flail chest (non-FC) injuries within 72 hours of admission and ideally within 24 hours.

Objective: This study aimed to evaluate whether sociodemographic factors are associated with delays in SSRF for non-flail chest (non-FC) patients.

Methods: This retrospective cohort study analyzed the 2021-2023 TQIP database to identify adults (≥18 years) with rib fractures who underwent SSRF. Sociodemographic characteristics included age, sex, race, ethnicity, residence type, and primary payment method. The primary outcome was the time to SSRF, defined as the interval in hours from emergency department arrival to operative fixation. Multivariable linear regression was used to assess associations with sociodemographic and clinical factors.

Results: Of 8,135 adult patients with non-FC rib fractures who underwent SSRF between 2021 and 2023, 7,536 with complete data were included in the final analysis. The median (IQR) time to SSRF was 65 hours (41–103). 10.8% of patients underwent SSRF within 24 hours and 57.5% within 72 hours. Multivariable regression analysis showed that Black patients experienced a 10.8% longer time to SSRF compared to White patients (p=0.002), and increasing age was associated with a 0.23% increase in time to SSRF per year (p=0.001). No significant associations were observed for sex, other race categories, Hispanic ethnicity, residential status, or insurance status.

Conclusion: Disparities appear to exist in the time to surgical stabilization of rib fractures. Further research is needed to determine if targeted interventions are warranted to address the barriers contributing to these delays.

Predictors	*Estimates*	*% change*	*95% CI for % Change*	*p*
Intercept	4.082	–	–	**<0.001**
Age in Years	0.002	0.23	0.10 – 0.35	**0.001**
Sex = Female	0.016	1.58	-2.47 – 5.81	0.450
Race = Black	0.103	10.82	3.88 – 18.22	**0.002**
Race = Other	0.019	1.89	-5.13 – 9.43	0.607
Race = Unknown	-0.100	-9.54	-23.35 – 6.75	0.235
Hispanic or Latino	-0.037	-3.59	-9.97 – 3.24	0.295
No private residence	-0.005	-0.51	-10.77 – 10.94	0.927
Private primary method of payment	0.000	0.01	-3.96 – 4.15	0.995
Other/Unknown primary method of payment	-0.008	-0.79	-6.55 – 5.33	0.795
ISS	0.016	1.60	1.36 – 1.84	**<0.001**
Total GCS	-0.014	-1.36	-2.00 – -0.72	**<0.001**
Maximum Chest AIS severity	-0.061	-5.89	-8.56 – -3.14	**<0.001**
Observations	7536			

ePoster #33 | Abstract | Clinical Science | Trauma/Burn/Critical Care

A Storm-Driven Surge: Increased Motor Vehicle Crash Incidence Around Named Storm Landfall

J Pujol, S Caputo, A Campbell, R Adkins, M Ghio, K Harrell , J Zhang, C McGinness, D Tatum, S Taghavi,

Background: Natural disasters can increase motor vehicle collisions (MVCs) through hazardous weather and infrastructure disruptions. Although MVCs contribute to storm-related fatalities, the relationship between named tropical storms and hurricanes (NTSH) and MVC-related trauma activations (MRTAs) remains understudied.

Objective: This study evaluated the impact of NTSH on MRTAs, hypothesizing that NTSH would be associated with increased MVC frequency and injury severity.

Methods: This retrospective cohort review examined patients who presented with MRTAs to a Level 1 trauma center in the Gulf South during 2016-2023 hurricane seasons. NTSH were identified through the National Weather Service. Traffic data was collected via Department of Transportation cameras on a major hurricane evacuation route. Storm phases were categorized as landfall (2 days before to 7 days after landfall), aftermath (7-21 days post-landfall), and control (all other days during hurricane season). The primary outcome was the average daily MRTA count across storm phases. Secondary outcomes included emergency department (ED) and in-hospital mortality.

Results: Ten NTSH and 3,003 MRTAs occurred; 97 (3.2%) patients died. Traffic volume did not vary significantly across phases (p=0.58). On multivariate analysis, the aftermath period was associated with an 85% higher daily MRTA count than landfall. Male sex remained independently associated with a higher daily MRTA count. MRTAs during landfall were associated with increased in-hospital mortality versus control (OR 3.33, CI 1.39-7.46, p=0.01).

Conclusion: Average daily counts of MRTAs appear to increase during the aftermath of NTSH. NTSH are associated with increased MRTAs and mortality. Further research is needed for targeted injury prevention and informed public health responses.

Table 1. Multivariable Analysis of Demographic and Meteorological Factors Affecting the Average Daily Count of MVC-Related Trauma Activations

Variable	Odds Ratio	95% CI	P-value
Aftermath period	1.85	1.41-2.52	<0.001
Age	0.96	0.88-1.05	0.40
Male	1.44	1.18-1.87	<0.001
Rainfall	0.66	0.42-1.05	0.075
Wind speed	1.01	0.99-1.02	0.40
Distance from landfall to trauma center	1.00	0.99-1.01	0.50

ePoster #35 | Abstract | Basic/Transactional Science | Trauma/Burn/Critical Care

Inflammatory Cytokines After Blood Transfusion in Trauma Patients: A Pilot Study

A Campbell, D Bruce, A Mohr, T Loftus, L Lottenberg, J Duchesne, S Taghavi, O Jackson-Weaver,

Background: The systemic inflammatory response is a key driver of complications and prolonged recovery following trauma. Blood transfusion, the cornerstone of trauma resuscitation, has unknown effects on the post-injury inflammatory response. While pro-inflammatory cytokines such as tumor necrosis factor alpha (TNF-α), interleukin-6 (IL-6), and C-reactive protein (CRP) have been implicated in post-injury immune activation and organ dysfunction, their association with real-world clinical outcomes remains incompletely defined.

Objective: This pilot study aimed to evaluate the relationship between circulating inflammatory cytokines and in-hospital complications in trauma patients who received blood transfusion.

Methods: This is a retrospective analysis of Level 1 trauma patients who received allogenic blood transfusion. Assays evaluated markers of inflammation, including tumor necrosis factor alpha, interleukin-6, norepinephrine, granulocyte colony-stimulating factor, C-reactive protein, fibroblast growth factor 23, corticosterone, and transforming growth factor beta. Other variables, such as age, sex, lactate, and Injury Severity Score (ISS) were also reviewed. Unadjusted linear regression was performed to evaluate the association between each inflammatory marker and ICU length of stay. We tested separate multivariate linear regression models for each cytokine, adjusting for age, sex, lactate, and injury severity score, with ICU length of stay as the dependent variable.

Results: Of 121 total patients enrolled in the study, 20 (16.5%) were over the age of 65 and 44 (36.4%) were female. Ninety-two patients (76.0%) had ISS > 15. On linear regression, higher plasma levels of TNFalpha ($p = 0.044$) and C-reactive protein ($p = 0.047$) were both independently associated with longer ICU length of stay, along with lactate level on arrival and injury severity score. Linear regression of each inflammatory marker with ICU length of stay demonstrated significant positive relationships for TNFalpha (correlation coefficient = 0.340, $p = 0.004$), C-reactive protein (correlation coefficient = 0.0002, $p = 0.004$), fibroblast growth factor 23 (correlation coefficient = 0.017, $p = 0.027$), lactate (correlation coefficient = 2.039, $p < 0.001$), and injury severity score (correlation coefficient = 0.277, $p < 0.001$).

Conclusion: Plasma levels of TNFalpha and C-reactive protein were independently associated with ICU length of stay after blood transfusion for the trauma patients in this study. Fibroblast growth factor 23 was positively correlated with ICU length of stay, but this was not a significant predictor in the multivariable analysis. This suggests that the inflammatory status in trauma patients may influence outcomes, and that measurements of these markers in plasma samples could be of clinical value.

Multivariable Regression Results						
Variable	**Estimate**	**Standard error**	**95% CI**	**|t|**	**p**	**R^2 with other variables**
Plasma TNF-a	0.2183	0.1065	0.006187 to 0.4305	2.05	0.0438	0.1175
Plasma IL-6	0.007121	0.009509	-0.01182 to 0.02606	0.7489	0.4563	0.05224
Plasma NE	-0.00066	0.000794	-0.002237 to 0.0009251	0.8263	0.4112	0.06555
Plasma TGF-b	-0.2734	0.2312	-0.7350 to 0.1881	1.182	0.2412	0.1616
Plasma G-CSF	0.003515	0.002413	-0.001291 to 0.008320	1.457	0.1493	0.0394
Plasma CRP	0.000132	6.54E-05	1.914E-006 to 0.0002625	2.021	0.0468	0.08645
Plasma FGF23	0.01053	0.006718	-0.002887 to 0.02396	1.568	0.1218	0.05012
Plasma Corticosterone	0.03949	0.03858	-0.03744 to 0.1164	1.024	0.3095	0.09904

Table 1. Multivariable Regression Results

ePoster #36 | Abstract | Clinical Science | Trauma/Burn/Critical Care

Use of Bromelain-Based Enzymatic Debridement in Combination with Serial Autologous Skin Cell Suspension Application for Deep Facial Burns: A Case Series

M Gujju, A Hong, J Schoen, J Carter, M Miles,

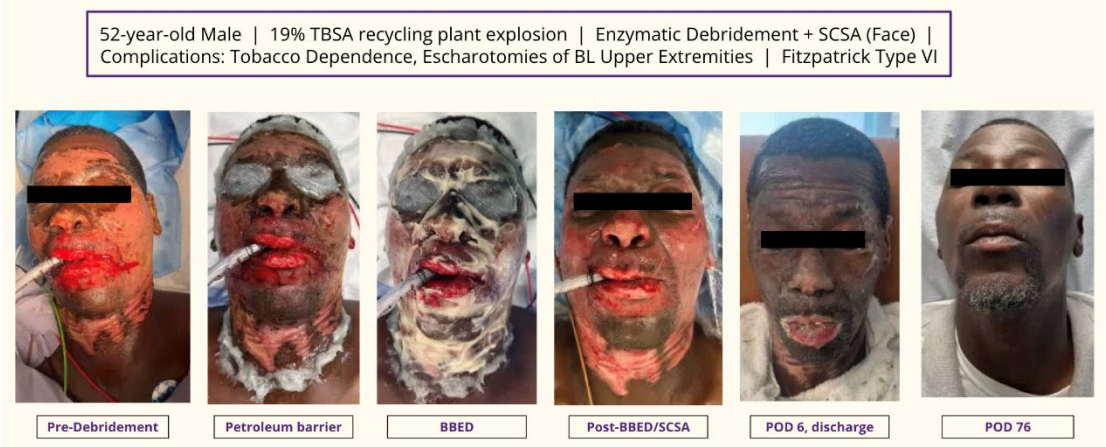
Background: The goal of acute burn management is timely removal of irreversibly injured tissue while preserving viable dermis. Traditional surgical debridement is effective but non-selective, risking tissue loss, bleeding, and delayed closure—particularly detrimental in facial burns, where scarring impairs function and cosmesis. Bromelain-based enzymatic debridement (BBED) uses proteolytic enzymes from pineapple stems to selectively remove necrotic tissue while sparing dermis. Its use in deep facial burns remains underreported. This case series describes BBED followed by skin cell suspension autograft (SCSA) in six patients with facial or scalp burns, highlighting procedural details, outcomes, and comparison with standard care.

Objective: To evaluate outcomes of BBED combined with SCSA application for deep facial and scalp burns.

Methods: Six patients (ages 16–52 years, 10–67% TBSA burns including facial or scalp involvement) underwent BBED followed by SCSA during initial burn debridement. Timing, technique, and outcomes were recorded, focusing on wound healing, graft take, complications, and hospital stay.

Results: BBED was applied to the facial or scalp burn area for 65–150 minutes, achieving excellent eschar removal and dermal preservation. Two patients required repeat SCSA for cosmetic optimization. No enzymatic complications occurred. All six patients showed high graft take, rapid healing, and favorable cosmetic outcomes. Four of six were discharged before the 1-day-per-percent-TBSA threshold (58%, 57 days; 67%, 58 days; 19%, 13 days; 21%, 34 days; 35%, 23 days; 10%, 13 days).

Conclusion: BBED followed by SCSA application is a safe, effective approach for deep facial and scalp burns, enabling selective debridement, dermal preservation, and improved functional and cosmetic recovery.



ePoster #38 | Abstract | Basic/Transactional Science | Trauma/Burn/Critical Care

Dimethyl sulfoxide mitigates trauma-induced coagulopathy through endothelial glycocalyx protection via membrane reorganization in a rat hemorrhage-resuscitation model

D Engelhardt, L Parekh, C Mills, Z Brandt, R Shackett, F Shaheen, S Taghavi, O Jackson-Weaver,
Tulane School of Medicine

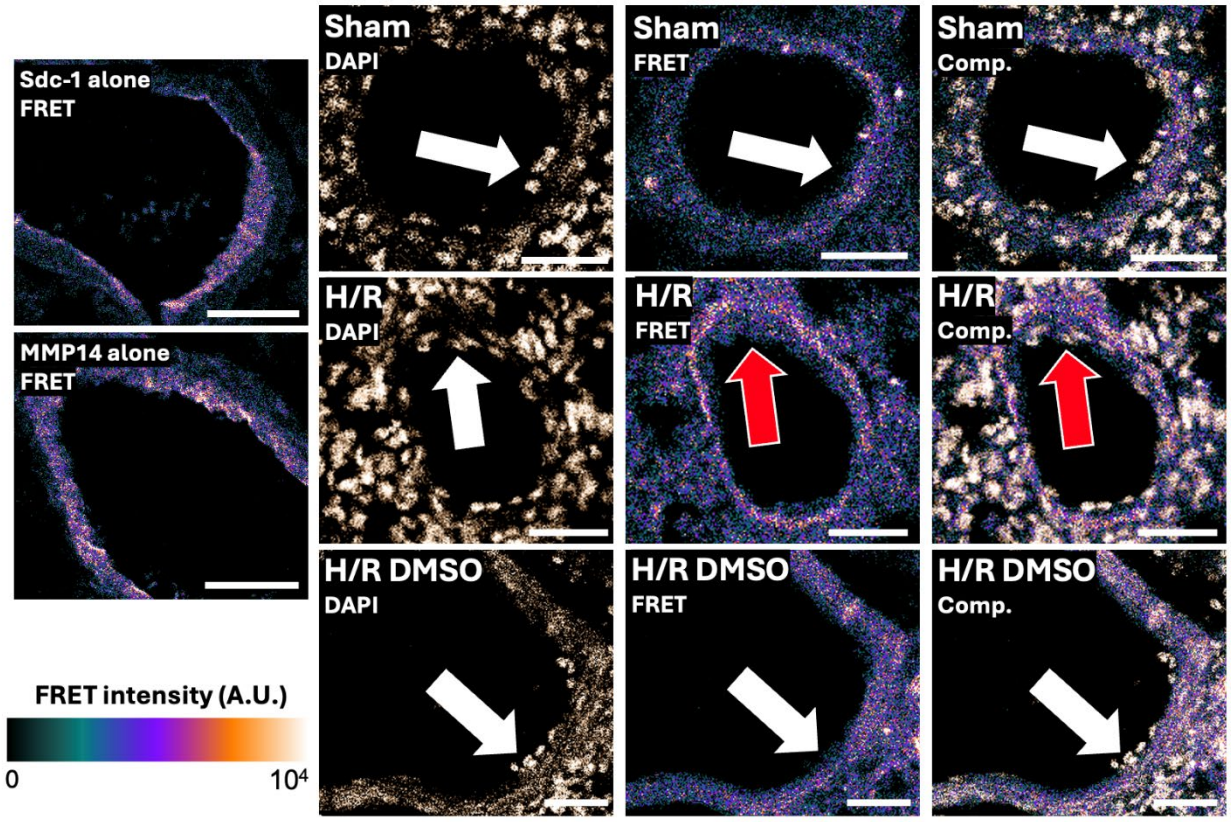
Background: Hemorrhagic shock (HS) plays a major role in the elevated mortality and morbidity of trauma patients, and often leads to coagulopathy. While the main treatments for HS rely on combating exsanguination, more recent discoveries have shed light on the protection of the endothelial glycocalyx (GCX) as a method to prevent coagulopathy.

Objective: In this study, we hypothesized that dimethyl sulfoxide (DMSO) would protect the GCX and mitigate coagulopathy in a trauma-relevant rat model of hemorrhagic shock and resuscitation (H/R). We further elucidate DMSO's mechanism of action by showing that DMSO's ability to prevent membrane reorganization decreases the interactions between the sheddase enzyme MMP14 and syndecan-1.

Methods: Male Sprague-Dawley rats were anesthetized, and the right jugular and bilateral femoral arteries were cannulated. Mean arterial pressure (MAP) was reduced to 40 mmHG by withdrawing blood and kept at 40 mmHG for 30 minutes. Animals were then resuscitated with IV lactated Ringer's to a MAP of 60 mmHG for an additional 60 minutes. DMSO-treated animals (n=8) received 200 µl/kg of DMSO at the beginning of resuscitation and were compared to sham (n=8) and untreated hemorrhage animals (n=8). Samples for blood chemistry, prothrombin time, and glycocalyx shedding were drawn throughout the hemorrhage procedure. Additionally, tissue samples of lung, brain, kidney, and small intestine were taken for analysis of glycocalyx shedding, fibrin deposition, and endothelial MMP14-syndecan-1 interaction.

Results: H/R animals displayed damaged glycocalyx across the organs studied. DMSO treatment reduced the glycocalyx loss in the lung ($p = 0.0017$), brain ($p = 0.0356$), and small intestine ($p = <0.0001$). Levels of plasma syndecan-1 was elevated in H/R animals but DMSO significantly reduced this effect (4.238 µM vs. 1.958 µM $p=0.018$). While untreated H/R animals showed a significant increase in PT from the start and end of H/R (14.69 vs. 16.89, $p=0.0017$), DMSO-treated rats showed no significant increase in PT (14.69 vs. 15.40, $p=0.3233$). Rats treated with DMSO showed a significant reduction in fibrin deposition in lung tissue as shown by average deposit count ($p=0.0007$) and average percent area ($p=0.0004$). Additionally, DMSO-treated rats showed a significant decrease in endothelial MMP14-syndecan-1 interactions when compared to H/R rats ($p= 0.0328$).

Conclusion: DMSO treatment during resuscitation protects against H/R-induced GCX shedding in multiple organ tissues (lung, brain, small intestine), mitigating coagulopathy as measured by prothrombin time. DMSO also alleviates fibrin deposition within lung tissue. We suggest that DMSO protects the endothelial glycocalyx by increasing endothelial membrane fluidity, thus preventing membrane reorganization and decreasing sheddase-GXC interactions. DMSO shows potential as a future therapy to treat coagulopathy in trauma patients.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