Poster #31

CAN POWERPOINT SAVE LIVES? ASSESSMENT OF EQUITY AND REACH OF TRADITIONAL DISSEMINATION CHANNELS IN GERIATRIC TRAUMA EDUCATION—A MIXED-METHODS STUDY USING DIGITAL ANALYTICS

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Introduction: Creation of evidence-based clinical guidance resources does not necessarily improve patient outcomes or standardize care without deliberate education, dissemination, and implementation. We sought to better understand the effectiveness of recorded didactics in improving knowledge as well as the equity, effectiveness, and reach of various information dissemination strategies, and to elucidate providers' typical means of knowledge acquisition.
Methods: An observational mixed-methods study was conducted amongst all United States' trauma care clinicians from March to August 2023. A 20-minute didactic video on anticoagulant management in geriatric traumatic brain injury (TBI), along with pre-and post-video knowledge surveys, was created by the American Association for the Surgery of Trauma (AAST) Geriatric Committee. This was circulated via email and social media accounts affiliated with 7 professional trauma societies as well as state and regional health departments. Digital analytics were captured, and descriptive and regression analyses conducted.
Results: The didactic video was viewed 1,407 times on YouTube with a mean view time of 7 minutes. Email was the primary point of access (85%), usually via computer (75.1%), and yielded the highest mean view time (9:13 minutes) and overall watch time (152.8 hours). Computers also yielded the longest mean view time (8:10 minutes) and overall watch time (143.9 hours). A total of 311 participants responded to the survey. Most were registered nurses (RNs) from urban, non-academic institutions with 11+ years of clinical experience. Of these, 31.9% were in a rural practice and 38.6% at a Level III/IV trauma center. Only 16.1% of respondents correctly answered all pre-video knowledge question (n=48/298); this increased to 51.6% post-video (n=94/182). Surgeons and advanced practice providers (APPs) ($r=0.148$, $p<0.05$), male respondents ($r=0.131$, $p<0.05$), and clinicians at higher-level trauma centers ($r=-0.140$, $p<0.05$) answered more pre-video questions correctly. Surgeons and APPs were more likely than RNs to report primary use of literature ($r=0.134$, $p<0.05$) and point-of-care medical information ($r=0.133$, $p<0.05$). Less experienced ($r=-0.174$, $p<0.01$) and academic clinicians ($r=0.126$, $p<0.05$) were more likely to confer with colleagues. Neither trauma center designation, urban/rural location, nor race/ethnicity was associated with means of knowledge acquisition.
Conclusion: Recorded didactics are associated with improved knowledge of anticoagulation management in geriatric TBI. Trauma society-sponsored email is an effective means of information dissemination to urban, Level I/II trauma centers, but still fails to reach many rural and Level III/IV trauma centers. Further study is needed to better understand end-user needs to optimize dissemination and implementation of up-to-date clinical guidance.

Poster #32

DIVERSITY IN CRISIS: THE IMPACT OF RACE AND ETHNICITY ON FAILURE-TO-RESCUE AMONG GERIATRIC TRAUMA PATIENTS OVER THE YEARS

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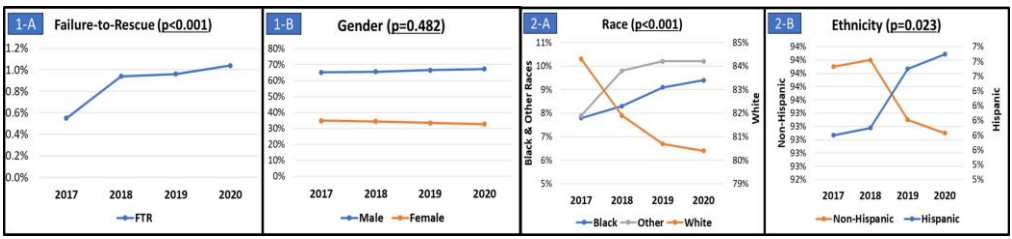
Introduction: This study aimed to examine the trends of failure-to-rescue (FTR) (death from a major complication) incidence in geriatric trauma patients over the years and to determine whether race, ethnicity, and gender impact the FTR incidence among these patients across the United States.
Methods: In this retrospective analysis of ACS-TQIP (2017-2020), Geriatric (≥60yrs) trauma patients were included. FTR was defined as death following a major complication (cardiac arrest, MI, sepsis, ARDS, unplanned intubation, acute renal failure, CVA, ventilator-associated pneumonia, or pulmonary embolism). Patients were stratified based on Race (White vs. Black vs. Others), ethnicity (Hispanic vs. non-Hispanic), and gender.
Results: 1,105,651 geriatric patients were identified, of which 30,984 (2.8%) developed major complications and 10,684 (34.5% of those with complications) had FTR. Mean age was 75, 46% were male, 86% were White, and 6% were Hispanic. Median [IQR] ISS was 9 [4-10] with no change over the years (p=0.364). Over the 4 years, the rate of FTR increased from 0.55% in 2017 to 1.04% in 2020 (p<0.001) (Fig 1A). An analysis of trends in FTR patients revealed no significant difference in the proportion of males and females over the years (p=0.482) (Fig 1B). However, there was a notable increase in the proportion of Black and Hispanic patients in comparison to White (p<0.001) and non-Hispanic patients (p=0.023), respectively (Fig 1C&1D). After controlling for confounding factors, odds of developing FTR increased over the years (aOR:1.08, p<0.001), with Black race (aOR:1.29, p<0.001) and Hispanic Ethnicity (aOR:1.12, p=0.005) identified as independent risk factors for FTR.
Conclusion: Despite the recent advancements in geriatric trauma care, the risk-adjusted odds of developing FTR have been increasing over the years, with one in every three patients developing complications not surviving to discharge. Our findings demonstrate that racial and ethnic factors significantly impact the incidence of FTR. Whether these disparities are attributable to the quality of care or patient-related factors is yet to be defined.



Poster #33

A GEOSPATIAL ANALYSIS OF GENTRIFICATION, GUN VIOLENCE AND DISPARITIES IN CARE FOR SHOOTING VICTIMS

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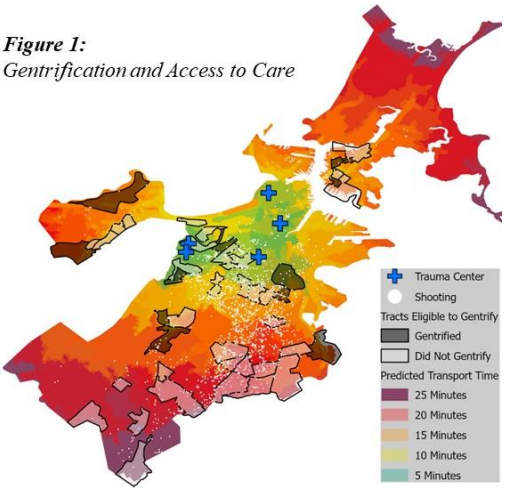
Introduction: Gentrification (GN) is associated with a displacement of shootings from gentrifying areas and 20% of American neighborhoods have undergone GN. However, the relationship between GN and access to trauma care is unknown. We evaluate the impact of GN on shooting rates, transport times to trauma centers, and survival in Boston, Massachusetts.
Methods: Using 2010-2020 census data, GN was defined by educational attainment and median home value. Shooting data were obtained from the Boston Police and geocoded into census tracts (CT) stratified by GN. Transport times were calculated using ArcGIS Pro analysis of traffic data. The primary outcome was shooting rates. Secondary outcomes were fatality rates, race of shooting victims and transport times. Poisson regression was used for shooting/fatality rates and Kruskal-Wallis tests for transport times.
Results: Of 171 CT, 57 (33%) were eligible for GN and 11 (19%) gentrified. There were 2,311 shootings, with lower shooting rates in gentrifying CT (β -0.69, 95% CI -0.93 to -0.45, $p<0.0001$) but no differences in fatality rates or racial distribution of shootings. Median transport times were longer in non-gentrifying CT (11.71, IQR 5.82-15.51) than gentrifying (7.10, IQR 7.08-10.92) and ineligible CT (9.54, IQR 6.20-13.63, $p<0.0001$). This data is presented in Figure 1.
Conclusion: GN was associated with lower shooting rates, resulting in more shooting victims with longer transport times in non-gentrifying areas. Understanding redistribution patterns of shootings may help to inform future violence prevention efforts and trauma system planning.

Figure 1:
Gentrification and Access to Care



Poster #34

CARE COMPLEXITY PREDICTS OUTPATIENT EMERGENCY HEALTHCARE UTILIZATION IN FIREARM INJURY SURVIVORS

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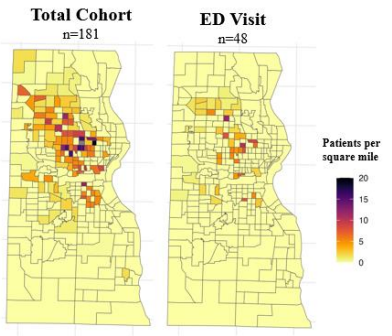
Introduction: Firearm injury survivors (FIS) may have difficulty accessing outpatient care and are more likely to visit the emergency department (ED) after hospital discharge. Having implemented a longitudinal care team consisting of a medical social worker and a nurse navigator to improve outcomes for FIS, our objective was to review predictors of ED utilization and unplanned readmissions within 60 days of hospital discharge.

Methods: This was a prospective study where FIS were randomized 1:1 to the care team or standard of care (SOC) groups. The main outcomes were ED visits and unplanned readmissions. Patient demographics, home address, injury patterns, operative characteristics, and clinic follow-up were utilized to determine predictors of the main outcomes.

Results: There were 110 patients in the SOC and 109 in the care team groups. There were no differences in the number of patients who visited the ED (27% SOC vs 20% care team) or who were readmitted (16% SOC vs 18% care team). As there were no differences between groups, predictors were compared in aggregate. Those who were discharged with a drain (n=17) were 3x more likely to visit the ED (OR 2.86; 95% CI 1.0 – 8.0; p=0.04). Discharge with an ostomy (n=11) had a four-fold increased risk of being readmitted (OR 4.23; 95% CI 1.1 – 15.2; p=0.03). Most patients who visited the ED attended their outpatient follow-up appointment. The mean social vulnerability index of the entire cohort was 0.86 (SD=0.12) indicating high vulnerability, and patients who visited the ED came from specific, vulnerable areas (Figure 1).



Conclusion: Emergency healthcare utilization is common after firearm injury, and complex care needs are predictors. In light of high social vulnerability and geographic distribution, a comprehensive approach to care addressing social determinants of health is necessary to improve outcomes.

Poster #35

CRIME VICTIM COMPENSATION AFTER FIREARM INJURY - AN UNFULFILLED PROMISE?

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Selwyn Rogers, MD, MPH, FACS; David Hampton, MD, MEng, FACS;
Toba Bolaji, DO; Jennifer Cone, MD, MHS, FACS;
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Introduction: The Crime Victim Compensation (CVC) program is a reparations program from the 1980s. It was established to offer significant financial support for survivors of violence and/or families to help recovery after trauma. In Illinois, CVC provides up to $45,000 of financial assistance, however few firearm injury survivors receive this support. Barriers to CVC may exacerbate injured patients' trauma, hinder their ability to recover physically, financially, and emotionally, and may increase the risk of re-injury. The purpose of this study was to quantify and understand barriers that violently injured patients face in receiving CVC.
Methods: Mixed methods were used to conduct semi-structured interviews using qualitative methodology of federal program stakeholders, CVC advocates and facilitators (community violence interrupters & intervention specialists), survivors and family members. We further filed a Freedom of Information Act claim with the Office of the Illinois Secretary of State, to analyze claims for homicide from 2012-2023.
Results: 30 participants (stakeholders (n=9), advocates & facilitators (n=12), survivors & family members (n=9)) were interviewed. Administrative burdens, including those unique to Illinois, was the dominant theme. These burdens included the timeliness of compensation, the reimbursement vs. compensation model, necessity of "court-of-claims" processing, police department obstructionism, and adequacy of perceived reparations. These burdens eroded trust in violence prevention programs. There were 42,390 applications for CVC in Illinois over the study period. The median age of applicants was 30 years IQR [22,41]. A total of 16,803 (39.6%) applicants were women. Only 16,075 (37.9%) applicants were awarded pay, with an average of $4,995.85 per successful applicant. In comparing claimants who self-identified as white, claims from those of all other races took longer to process ($P< 0.0001$).
Conclusions: Administrative burdens prevent access to CVC funds in Illinois, undermining its original intent as a reparations program. Less than half of applicants receive CVC. Removing these barriers is vital to making CVC more accessible to promote healing and prevent re-injury for patients and families. Elimination of these barriers is also critical to maintaining trust between patients, hospital-based injury prevention programs and state welfare institutions, which is compromised when extensive application processes yield no results.

Poster #36

EFFICIENCY AND EQUITY IN TRAUMA CARE COSTS: A NATIONWIDE PROPENSITY-MATCHED ANALYSIS OF SEVERELY INJURED PATIENTS IN SAFETY NET HOSPITALS

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Introduction: Safety net hospitals are key providers for marginalized populations and face distinct challenges and, consequently, may exhibit variations in length of stay, discharge disposition, and hospitalization costs. The purpose of this study was to analyze these aspects to enhance equity and efficiency in caring for severely injured trauma patients including readmissions throughout the US.
Methods: The Nationwide Readmissions Database for 2016-2020 was queried for all surviving trauma patients over 17 years of age and with an Injury Severity Score over 15. Patients admitted to safety net hospitals were identified as publicly funded, metropolitan academic, and large by bed size per region of the country. Propensity matching was performed one to one for safety net patients to non-safety net patients using predictors for age, gender, comorbidities, injury characteristics, household income, and insurance status. The primary outcome was length of stay (LOS) and the secondary outcomes were discharge disposition, and total hospitalization charges and cost including 30-day readmissions. Chi-squared was used for categorical variables and Student's t test was used for continuous variables.
Results: There were 852,397 total patients meeting inclusion criteria with 13.2% (n=112,614) admitted to safety net hospitals. After matching, the mean LOS for safety net hospitals was 9.3 ±13.6 days and for non-safety net hospitals the mean LOS was 8.2 ±11.3 days ($p< 0.01$). The overall most common discharge disposition was routine (home or self-care) with a rate of 50.9% (n= 80,807). The rate of transfer to rehab or skilled nursing facility (SNF) was 30.7% (n=48,705) and home healthcare (HHC) was 15.5% (n=24,686). Safety net hospitals were less likely to utilize HHC (OR 0.86 [0.83-0.88] $p< 0.01$). Safety net hospitals had lower mean total charges than non-safety net hospitals ($138,056 ±$204,651 versus $142,904 ±$223,239, $p< 0.01$). Safety net hospitals had a higher mean total cost than non-safety net hospitals ($38,664 ±$55,174 versus $31,336 ±$44,845).
Conclusions: This study represents a unique analysis of trauma hospitalization costs by including readmissions. Safety net hospitals, despite facing distinct challenges, demonstrate longer lengths of stay and underutilize home healthcare. Safety net hospitals incur lower mean total charges, however higher total cost suggests underlying complexities in resource allocation and financial dynamics. These findings emphasize the need for targeted interventions to enhance the efficiency and equity of trauma care delivery in safety net hospitals.

Poster #37

MENTAL HEALTH SCREENING AND CONSULTATION RATES DEMONSTRATE HIGH NEED AT TRAUMA CENTERS

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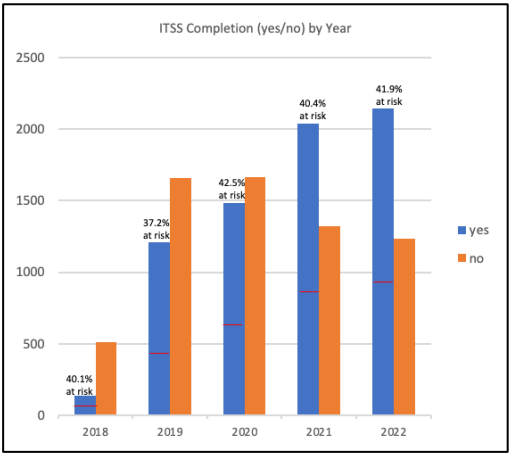
Introduction: Given risk of psychopathology post-injury, the ACS-CoT requires protocols for mental health screening and referral. We examined implementation of the multitier approach to psychological intervention after traumatic injury (MAPIT) which incorporates screening, inpatient psychological evaluation, and ongoing, as-needed intervention.

Methods: A retrospective study at a Level 1 trauma center explored the MAPIT model which includes four tiers: 1) screening for PTSD and depression using the Injured Trauma Survivor Screen (ITSS); 2) psychology consultation for positive risk; 3) inpatient psychology evaluation; 4) as needed intervention. Screening and consultation were evaluated in relation to hospital characteristics including length of stay (LOS) and injury severity (ISS).

Results: Participants (N=6997) included adults admitted after injury from 2018-2022. Overall, 40.8% of patients screened at risk. Screening rates increased each year (Fig 1), consults quadrupled over time (175 vs 703), and were completed on average at hospital day 4 (SD=7.48). ISS correlated with increased time to consult (r=.26, p<.001) but more follow ups (r=.18, p<.001) and cumulative intervention time (r=.09, p=.002). Those who were less likely to get a consult had lower ISS (B=-.04, p<.001) and shorter LOS (B=-.06, p<.001); yet, 36.4%-42.0% of those screened at risk still did not receive consult [$X^2(3)=495.67, p<.001$].



Conclusion: The MAPIT model successfully screens for risk and provides early intervention, particularly for patients with long LOS waiting to access outpatient treatment. Future work must continue to address barriers (e.g., early discharge) to ensure equitable mental health care for high-risk trauma patients and meet growing needs.

Poster #38

RACIAL AND ETHNIC DISPARITIES IN DISCHARGE SERVICES AMONG ELDERLY PATIENTS WITH MODERATE TO SEVERE TRAUMATIC BRAIN INJURIES IN THE UNITED STATES

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Introduction: Elderly trauma patients are at the greatest risk of requiring post-discharge services, including home health, nursing care, or inpatient rehabilitation. We sought to identify potential racial and ethnic disparities in services available to elderly traumatic brain injury (TBI) patients in the United States (US).

Methods: We analyzed the US National Trauma Data Bank (2011-2021). Medicare patients over the age of 65 with AIS of 3 or greater who survived discharge were stratified by race and ethnicity (non-Hispanic White; non-Hispanic Black; Hispanic; non-Hispanic Asian), and propensity score matched based on age, sex, Charlson Comorbidity Index, and Injury Severity Score (ISS). An ordered logistic regression was performed on the matched cohorts to estimate the odds ratio of receiving a higher level of discharge services compared to white patients. Discharge services included home, home with home health services, skilled nursing facility (SNF), and inpatient rehabilitation.

Results: We analyzed 387,274 patients. Race and ethnicity composition was 86.2% non-Hispanic White, 5.6% non-Hispanic Black, 5.0% Hispanic, and 3.2% non-Hispanic Asian. The mPoean age was 77.9 (SD 6.9) years, with a slight female preponderance (50.6%). The mean ISS was 16.4 (SD 7.7). After propensity matching, the cohorts were well-balanced. The odds ratio for a higher level of discharge services was lower for each minority group compared to white patients (Table 1).

Conclusions: In a propensity-matched cohort, all analyzed minority groups had lower odds of receiving a higher level of discharge services than white patients. Urgent work is needed to improve access to discharge services for racial minority groups to improve patient outcomes.

Patient Race/Ethnicity	Odds Ratio of Higher Level of Discharge Services (95% CI)
Non-Hispanic White	1.00
Non-Hispanic Black	0.94 (0.92, 0.96)
Non-Hispanic Asian	0.90 (0.87, 0.93)
Hispanic	0.77 (0.75, 0.79)

Table 1. Odds ratio for higher level of discharge services compared to white patients

Poster #39

RACIAL DISPARITIES IN INTUBATION WITHOUT CRITICAL INJURIES

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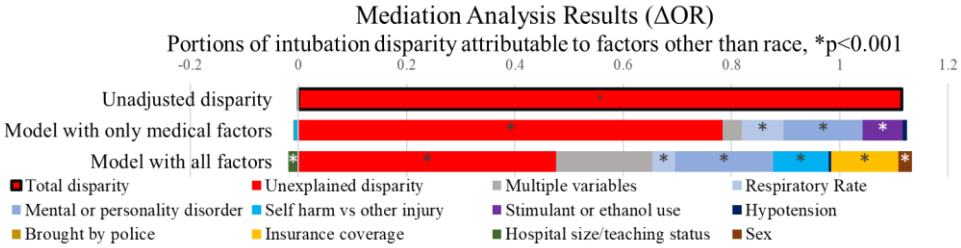
Introduction: Injuries that compromise the airway are inherently life-threatening and require intubation. However, patients are sometimes intubated for less objective reasons, such as 'combative' behavior. This study investigates whether there is a racial disparity in intubation among patients without typical indications in the National Trauma Data Bank.
Methods: Years 2017-2021 were queried from NTDB. Patients with Glasgow Coma Scale ≤ 8, Abbreviated Injury Scale ≥ 4 in any region, hypoxia (SpO2 < 88%), or ED disposition to the OR were excluded. A raw disparity in the rate of intubation within an hour of arrival was calculated and examined over time by comparing intubation in the trauma bay by racial group. Multiple mediation analysis was performed to evaluate potential contributors to these disparities.
Results: 3.4 million patients met criteria to be included. The largest disadvantage affected Black patients. In 2021, Black patients were more likely to be intubated than non-Black patients (1.27% vs. 0.64%), and this ratio has increased since 2017 (1.98:1 from 1.66:1). On multiple mediation analysis, about ¼ of the racial disparity could be alternatively associated with medical factors (such as respiratory rate), ¼ to non-medical factors (such as insurance), and ½ remained unexplained.
Conclusion: A racial disparity exists in how trauma centers manage airways. Institution-level investigations are needed to definitively determine the underlying causes of this gap. However, strategies to improve rapport in the trauma bay, such as increasing provider diversity or Trauma Informed Care, could reduce the quantity of these intubations performed.



Poster #40

DEMOGRAPHIC VARIATION IN TRAUMA TEAM ACTIVATION AFTER MOTOR VEHICLE CRASH PATIENTS

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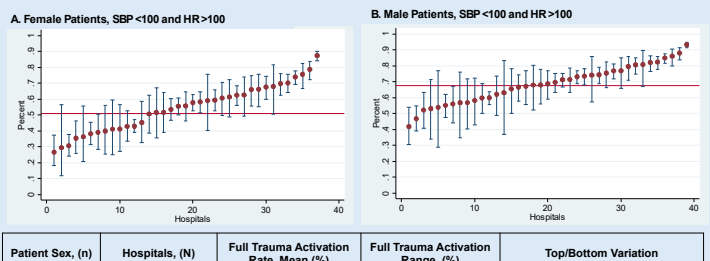
Introduction: Patients involved in motor vehicle crashes (MVCs) are known to be at risk for under-triage, where patients at risk for severe injuries do not receive a full trauma team activation. We sought to investigate hospital-level variation in under-triage among patients who presented with a decreased systolic blood pressure (SBP) and elevated heart rate (HR).
Methods: Patients were identified from a linkage between publicly available crash data with trauma registry data from a statewide quality collaborative from 2020 to 2022. We compared mean hospital-level activation rates among patients with first emergency department vitals of SBP<100 and HR>100. Risk- and reliability-adjusted mean activation rates were calculated for each trauma center, and compared across demographic cohorts of sex, age, and race.
Results: There were a total of 14,840 patients, of whom 2,299 (15.1%) received a full trauma activation. A total of 296 (1.9%) of patients had SBP less than 100 and HR greater than 100. The overall full trauma activation rate among patients with SBP<100 and HR >100 was 60.4%. Within this subset, there were similar average variation rates for age and racial groups, however there was a significant difference in mean full trauma activation between male and female patients (male 67.8% vs female 51.0%, p-value <0.01).
Conclusion: Across level 1 and level 2 trauma centers, there was significant sex-based variation in full trauma activation, even among patients with evidence of hypotension and tachycardia on presentation. These data highlight the ongoing risk for under-triage among patient subgroups, necessitating standardization and implementation of trauma protocols.

Figure 1. Hospital Average Full Trauma Activation after Motor Vehicle Crash by Patient Sex



Patient Sex, (n)	Hospitals, (N)	Full Trauma Activation Rate, Mean (%)	Full Trauma Activation Range, (%)	Top/Bottom Variation
Female	36	51.0%	26.7%-87.3%	3.3
Male	39	67.6%	41.8%-93.1%	2.2