

Introduction

- Severe burn injuries cause fluid shifts, coagulopathy, and systemic inflammation, often requiring transfusion.
- Level 1 trauma centers have specialized teams and resources to manage high-acuity patients.
- It is unknown if transfusion practices differ by trauma center designation after accounting for burn severity and patient factors.
- National guidelines for transfusion in burn care exist, but adherence across trauma center levels has not been well studied.
- Understanding these differences can guide standardization of burn care protocols nationwide.

Objective

- To evaluate whether burn patients treated at Level 1 trauma centers receive blood transfusions at different rates compared to those at non-Level 1 centers, after adjusting for injury severity and patient characteristics.

Materials and Methods

- Database:** Trauma Quality Improvement Program (TQIP), 2017–2022.
- Cohort:** 72,474 burn patients identified using ICD-9/10 codes.
- Primary Exposure:** Trauma center designation (Level 1 vs. non-Level 1).
- Primary Outcome:** Blood product transfusion (pRBCs, platelets, cryoprecipitate).
- Analysis:** Multivariable logistic regression adjusting for age, gender, %TBSA, inhalation injury, and ISS.
- Subgroup Analysis:** Conducted for patients with burns >20% TBSA to assess consistency of findings in more severely injured patients.

Results

Table 1. Presenting Injury Characteristics between Level 1 vs. Non-Level 1 Trauma Centers

	Level 1	Non-Level 1	p-value
ISS			
<9	29,805 (85.7%)	31,713 (84.1%)	<.001
9-15	3,034 (8.7%)	4,035 (10.7%)	<.001
16-24	425 (1.2%)	402 (1.1%)	<.001
>24	1,506 (4.3%)	1,554 (4.1%)	<.001
GSS	14.0 ± 3.15	14.2 ± 2.86	<.001
Supplemental Oxygen Needed	5,991 (17.8%)	5,992 (18.6%)	.007

*ISS: injury severity score; GCS: Glasgow Coma Scale

Table 2. Organ System Outcomes Comparing Level 1 vs. Non-Level 1 Trauma Centers

	Level 1	Non-Level 1	OR	p-value
ARDS	267 (.81%)	304 (.77%)	.970	.728
AKI	3,241 (8.6%)	3,165 (9.1%)	3.14	.011
DVT	275 (1.1%)	234(.81%)	1.21	.003
MI	156 (.45%)	140 (.37%)	1.25	.066
SSI	1,801 (5.2%)	1,522 (4.0)	1.25	<.001
Stroke	30 (.20%)	14 (.08%)	2.63	.005
Sepsis	50 (.93%)	2,176 (.68%)	1.38	.026
Unplanned OR	867 (2.5%)	867 (3.5%)	.722	<.001

*ARDS: acute respiratory distress syndrome, SSI: surgical site infection, DVT: deep vein thrombosis, MI: myocardial infarction, OR: operating room

Results

- Sample:** 72,474 burn patients identified (2017–2022); 47% treated at Level 1 centers.
- Presenting Severity:** Level 1 patients had higher ISS (mean 15.7 vs. 14.2), lower GCS, and more oxygen use on arrival (Table 1)
- Complications:** Overall complications between Level 1 vs. 2 are depicted in Table 2.
- Transfusion Practices:** No significant differences in rates of pRBC, platelet, or cryoprecipitate transfusion after adjusting for %TBSA, ISS, age, gender, and inhalation injury.
- Transfusion was driven by clinical severity rather than trauma center level.
- Subgroup analysis of patients with >20% TBSA burns showed similar transfusion patterns across center levels.

Discussion

- Level 1 centers treat more critically ill burn patients, but standardized transfusion protocols may result in consistent practices across trauma center levels.
- Differences in patient acuity do not appear to translate into significant differences in transfusion rates.
- The consistency in transfusion practices suggests widespread adherence to burn-specific transfusion guidelines regardless of trauma center designation.

Future Directions

- Examine the role of **ABA verification** and how it interacts with trauma center level to affect transfusion decisions.
- Incorporate **granular data** on transfusion timing and volume in future prospective studies.
- Evaluate triage protocols and EMS decisions to optimize burn patient transport to appropriate trauma centers.