# ACS COT Residents Trauma Papers Competition Title Page

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Title of the Abstract:   Current State of Hemorrhage Control and Hemostatic Resuscitation in Trauma Centers across the United States

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# Current State of Hemorrhage Control and Hemostatic Resuscitation in Trauma Centers across the United States

## Introduction

Hemorrhage is the leading cause of potentially preventable deaths after trauma. Advances in hemorrhage control and hemostatic resuscitation have demonstrated merit in improving patient outcomes. The aim of this study is to describe interventions in, and outcomes of, bleeding trauma patients on a national level.

## Methods

We performed a one-year (2017) analysis of the Trauma Quality Improvement Program. We identified adult (age ≥18 years) trauma patients receiving early PRBC transfusions (≤4 hours). Massive transfusion was defined as ≥4 PRBC units within 4 hours (MT-4) and ≥10 PRBC units within 24 hours (MT-24). Descriptive statistics were performed to report on hemorrhage control interventions, resuscitation requirements, and patient outcomes.

## Results

We identified a total of 30,463 adult trauma patients receiving early transfusions. Mean age was 44.7±19.1 years, 74.0% were male, 32.9% had penetrating injuries, and median ISS was 22 [13-33]. ED mortality was 8.1%, in-patient mortality 21.1%, and overall mortality 29.2%. A total of 27.1% underwent laparotomy for hemorrhage control, 9.2% angioembolization, 7.2% thoracotomy, and 1.0% REBOA, with associated mortality rates of 25.0%, 21.0%, 67.5%, and 57.6% respectively. Rates of MT-4 and MT-24 were 44.7% and 17.6%, with associated mortalities of 39.7% and 51.8% respectively. Mortality rates by number of PRBC and plasma units transfused within 24 hours are shown in Figure 1.

## Conclusion

Laparotomy is the most common surgical intervention for hemorrhage control. More than a quarter of trauma patients receiving transfusions died, with rates increasing to more than half in massively transfused patients. One in five patients receiving more than fifty units survive.

**Figure 1:** Mortality Rates by Units of PRBC and Plasma

| Units | PRBC | Plasma |
|-------|------|--------|
| 1-3 | 20% | 26% |
| 4-6 | 28% | 31% |
| 7-9 | 31% | 35% |
| 10-19 | 43% | 48% |
| 20-29 | 60% | 66% |
| 30-39 | 65% | 70% |
| 40-49 | 71% | 72% |
| 50-74 | 78% | 74% |
| ≥75 | 80% | 86% |