

Does Mode of Transport Affect Outcomes in Trauma Patients? Data from an Urban Trauma Center

Lauren Messer, MD; Richard Hayward, PhD; Elango Edhayan, MD. Surgery.

Introduction: Trauma systems are designed to rapidly transport patients to their highest level of care by Emergency Medical Services (EMS). Transport time to a trauma center (TC) may be a variable in decreasing the first peak in trimodal trauma death curves. We postulated that early transport by Private Vehicle (PV) may improve trauma mortality.

Objective: To compare survival outcomes for trauma patients transported via PV vs EMS.

Methods: This was a retrospective cohort study using data from the trauma registry of an urban ACS verified Level 1 TC from January 1, 2017 to December 31, 2021. We included patients who received the highest level of trauma activation. Demographic data, injury characteristics, Injury Severity Score (ISS), Revised Trauma Score (RTS) and mortality were compared between patients transported by EMS and PV. Univariable analysis was done with chi-squared analysis and Student's t-test; multivariable analysis was done with logistic regression.

Results: There were 1157 highest level activations in the EMS group and 536 in the PV group. The mean age of the group was 34.1 ± 16.4 years, 19.5% female and 80.2% black. Patients in the PV group

Characteristic	Died n = 275	Survived n = 1,419	p-value
Age (years), mean (SD)	40.6 (21.7)	32.9 (14.8)	< 0.001
ISS, mean (SD)	29.6 (18.4)	9.5 (10.1)	<0 .001
Gunshot Injury n (%)	428 (30.2%)	83 (30.2%)	0.99

were younger, more likely to have a gunshot wound to the torso and had lower mean ISS scores (all $p < 0.001$). Patients arriving by PV also had lower risk of mortality (OR = 0.30, $p < 0.001$). After controlling for group differences in a multiple regression model, the difference in mortality was no longer statistically significant (aOR = 0.85, $p = 0.637$).

Conclusion: Prehospital time (on-scene and transport time) to a trauma center plays an important role in trauma outcomes. Private vehicle transport is not associated with significant mortality differences when compared to similar patients transported by EMS. Patients with less severe injuries are more likely to survive if transported by private vehicle.