Likelihood of Receiving Analgesic Medication Varies by Trauma Severity and Intravenous Access

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BACKGROUND

Differences in prehospital analgesic provision for traumatic injuries are present by both emergency medical services (EMS) activation and patient characteristics. The role of trauma severity and intravenous access (IV) on analgesic delivery is not well studied and may act as mediators in the overarching relationship between patient characteristics and analgesic provision.

OBJECTIVE

Our objective is to evaluate the impact of trauma severity and IV access on delivery of analgesic medication among a nationally representative dataset of EMS activations.

METHODS

- Cross-sectional, retrospective evaluation of trauma-related activations with treatment/transport provided and documented injury
- Data Source: ImageTrend Collaborate, 2021-2022
- Fentanyl, morpine, nitrous oxide, hydromorphone, tramadol, ibuprofen, acetaminophen, ketamine, or ketorolac identified as analgesic medications
- Trauma severity determined using initial or final acuity of “critical”
- Used descriptive statistics and multivariable logistic regression to quantify the associations of severity and IV access on delivery of analgesic medication

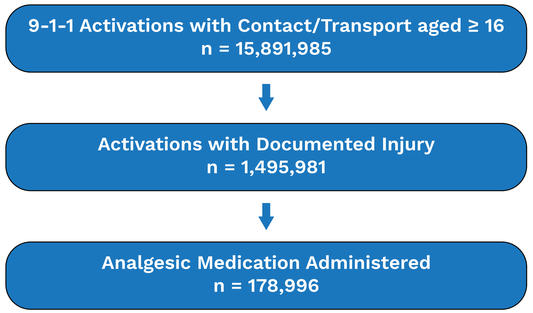


Figure 1. Flow diagram of EMS activations for study inclusion.

Table 1. Selected sample demographics of patients with a documented traumatic injury.

Characteristic	Analgesia Received n = 178,996	Analgesia Not Received n = 1,316,985
Age (median, IQR)	58 (36,75)	63 (39,79)
Sex (n, %)		
Male	82,695 (46)	623,151 (47)
Female	95,781 (54)	690,566 (53)
Missing	520	3,268
Urbanicity by Scene (n, %)		
Urban	130,900 (75)	1,052,140 (82)
Suburban	14,800 (8)	78,898 (6)
Rural/Wilderness	30,052 (17)	156,949 (12)
Missing	3,244	28,998



75% of activations receiving analgesia had **IV access** compared to 25% not



18% of activations receiving analgesia were classified as **severe**

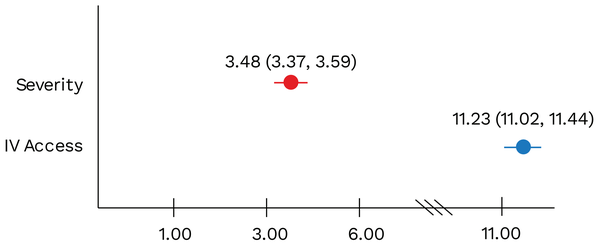


6% of activations receiving analgesia had **hypotension**

Figure 2. Activation assessment and treatment characteristics.

RESULTS

We identified 1,495,981 trauma-related activations during the study period. Analgesic delivery was noted in 12% of these activations. Proportionally, compared to those who did not receive analgesics, analgesic delivery occurred more often among female patients, in suburban/rural/wilderness locations, and with those who had vascular access or severe trauma.



Adjusted for age, sex, urbanicity, injury mechanism, and total patient contact time

Figure 3. Forest plot representing adjusted odds of analgesic medication delivery by exposures of interest.

CONCLUSIONS

We found analgesic delivery was associated with trauma severity and obtaining IV access in this evaluation of trauma-related incidents. Though limited by sampling and documentation variation, these finding may indicate the use of mediation analysis methodology to evaluate the association between activation/patient characteristics and analgesic medication delivery.

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