Trauma Video Review Analysis: Increased Provider Movement is Associated with Worse Outcomes

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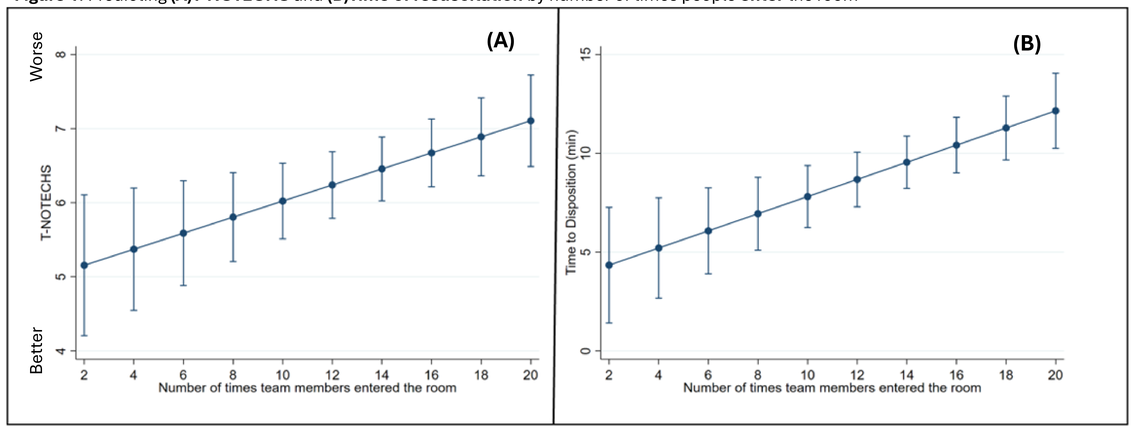
BACKGROUND

Team performance during trauma resuscitation, evaluated using video review, has been shown to impact patient outcomes. However, it remains unclear how the resuscitation environment affects team performance and patient outcomes. In this preliminary study we used the Trauma Black Box to study how personnel movements in and out of the room affect non-technical skills and time-to-disposition (TTD). We hypothesized that increased foot traffic correlates with worse team performance scores and TTD.

METHODS

The Institutional Review Board approved the use of Trauma Black Box technology to perform quality improvement and Trauma Video Review in our level I trauma center. In this preliminary assessment, we included Level 1 trauma activations. Patients who fell on anticoagulants were excluded. Ten percent of the videos were co-abstracted to minimize variability amongst raters and achieve consensus time definitions. Patient, injury, and resuscitation characteristics were reported as medians [Interquartile Range (IQR)] and proportions. Regressions controlling for injury severity were used to measure the association between foot traffic and the outcomes of interest: (1) T-NOTECHS *(Trauma non-technical skills scale)* score (5-15) and (2) TTD.

Figure 1: Predicting **(A)T-NOTECHS** and **(B)Time of resuscitation** by number of times people **enter** the room†



†*Multivariate regression analysis adjusted for* ***mechanism of injury*** *and* ***ISS***

Table 1: Baseline demographics of trauma cases

Characteristics	Overall Cohort N=39
Age†	39 [31-52]
Sex‡, *Male*	26 (67%)
Level of Injury‡	
Level 1	34 (87%)
Level 2	5 (13%)
Mechanism‡	
Blunt	21 (54%)
Penetrating	19 (49%)
Injury Severity Score† (ISS)	17 [9-26]
Movement†	
Starting Count	17 [15-29]
Number of times personnel **entered** the room	13 [8-18]
Number of times personnel **exited** the room	16 [12-21]

†Median [Interquartile Range]
‡n (%)

Table 2:Outcomes of interest

Outcomes	Overall Cohort N=39
Time to disposition, *min*	8 [6-11]
T-NOTECHS†	6 [5-7]

Median [Interquartile Range]
†Scale of 5-15, with lower scores implicating better team performance

RESULTS

We identified 39 Level 1 trauma activations. There were 19 (49%) penetrating injuries. The median ISS score was 17 [IQR: 9-26]. There was a median of 17 [15-29] individuals at the start. During resuscitations, individuals entered the room a median of 13 [8-18] times and left the room 16 [12-21] times (Table 1). The median TTD was 8 [6-11] min and the median T-NOTECHS score was 6 [5-7] (Table 2). Regression analysis showed foot traffic increased TTD (β 0.43, p-value <0.01) and worsened the T-NOTECHS score (β 0.11, p<0.01). Specifically, as the number of times people enter and leave the room increases from 6 to 18, TTD and T-NOTECHS score increases from 6 to 12 min and from 5.6 to 7.1 respectively (Figure 1).

CONCLUSIONS

Higher foot traffic during trauma resuscitation is independently correlated with poorer non-technical team performance and delays to disposition. Acknowledging the effect of these disruptions is crucial for optimizing trauma response strategies. Tighter control of the resuscitation environment represents an opportunity to improve the quality and efficiency of trauma care..

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