Accuracy of prehospital trauma scoring by EMS in a rural community hospital setting: A retrospective analysis

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AIM STATEMENT

The purpose of this study is to analyze the accuracy of prehospital trauma priority designation (TPD) by EMS providers based on Oklahoma's Prehospital Triage and Transport Guidelines (OPTTG).

ABSTRACT

Purpose of Research: The purpose of this study is to analyze the accuracy of prehospital trauma priority designation (TPD) by EMS providers based on Oklahoma's Prehospital Triage and Transport Guide (OPTTG) in order to identify inaccuracies and improve patient care. Our hypothesis is that EMS inaccurately triages trauma patients when compared to state guidelines.

Methods: A retrospective chart review compared TPD of EMS run reports to OPTTG. Data was extracted from all EMS services transporting trauma to Comanche County Memorial Hospital (CCMH) January 1, 2017 through December 31, 2019. Variables such as time of day, level of medic, gender, extremes of age, EMS agency, and mechanism of injury were predetermined for review using a standardized handbook. Upon review of the prehospital data, two emergency physicians then agreed on TPD and compared it with reported EMS TPD. Correction for chance agreement between physicians and EMS TPD was addressed using kappa scoring.

Results: Vanguard data review consisted of approximately 1,300 trauma charts, of which 269 patients had a prehospital TPD reported by EMS. The most common inaccuracy was under-triage of priority 2 traumas as priority 3 traumas (51/226 or 23%). Failures to recognize comorbidities or altered mental status were the 2 most common causes of under-triage.

Conclusions: Of the preliminary 269 patients, 20% of TPDs were inaccurately under-triaged not meeting standards of American College of Surgeons Committee on Trauma (ACSCOT) and demonstrated the need for further EMS education. Methodology was limited by incomplete TPD reported by EMS and small population size.

BACKGROUND

Unintentional injuries remain the leading cause of death among children and adults ages 1-44 and cost an estimated $177 billion per year in the United States.[2] The ultimate goal of trauma systems are to match the needs of the injured patient to the closest hospital with the capability to provide definitive care in the most appropriate timeframe. Trauma triage is a critical component of patient care and proper resource utilization.

Studies show that the elderly population is frequently under triaged in the prehospital environment.[3] ACSCOT has published acceptable rates for over triage and under triage of <25-35% and <5% respectively.[1]

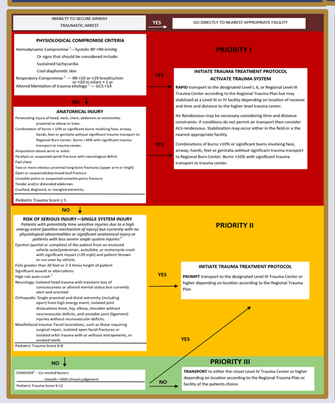
Oklahoma is divided into 8 Trauma Regions. Comanche County Memorial Hospital is located in the southwestern part of the state in trauma region 3 serving a current population of approximately 400,000. There are approximately 100 trauma transports to Comanche County Memorial Hospital per month.

METHODS

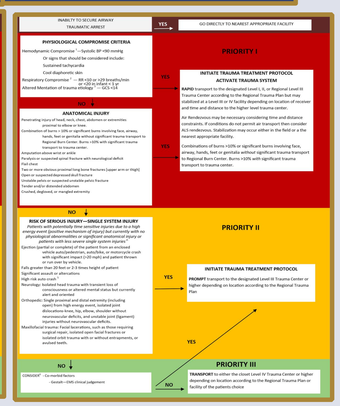
Retrospective chart review was performed to determine trauma priority designation based on OPTTG and compared to trauma priority designation documented by EMS. Preliminary data was collected from EMS reports between January 1st, 2017 and will continue through December 31, 2019. Methodology for data extraction was predetermined. Variables such as time of day, level of medic, gender, EMS agency, extremes of age and mechanism of injury were extracted. Chart review and data entry were performed by two physicians in attempt to further decrease bias and increase validity.[5] Correction for chance agreement between the physicians and EMS run reports was addressed using kappa scoring.

Oklahoma Priority Triage and Transport Guidelines

Pediatric



Adult



Pediatric Trauma Score (PTS)

Component	Score		
	+2	+1	-1
Weight	>20 kg	10 - 20 kg	< 10 kg
Airway	Normal	Oral or nasal airway	Intubated or tracheostomy
Systolic BP	>90 mm Hg	50 - 90 mm Hg	<50 mm Hg
Level of Consciousness	Awake	Obtunded or any loss of consciousness	Comatose
Open Wounds	None	Minor	Major or penetrating
Fractures	None	Minor	Open or multiple
Total Score			

9 - 12 Minor Trauma
6 - 8 Potentially life threatening
0 - 6 Life threatening
< 0 Usually fatal

RESULTS

- Our *preliminary* data consisted of 1,300 trauma patient charts, of which 269 patients had a listed trauma priority designation by EMS. When the study is complete, we anticipate n=3,600.
- The most common mechanisms of injury were same level fall (53.5%), MVC (18.97%), assault by other mechanism (11.37%) and assault by stabbing (4.55%).
- The overall percent agreement for priority 1 TPD was 80% (16/19), priority 2 trauma was 87% (20/23) and priority 3 trauma 77% (174/226).
- The highest level of discrepancy (23%) was due to under-triage of priority 2 trauma designation as priority 3 trauma designation.
- Of the 51 of patients that were under-triaged as priority 3 by EMS, age > 55 years with concurrent anticoagulation use and altered mental status were the two most commonly missed determinants.

EMS Trauma Priority Score compared to OPTTG scoring

EMS Trauma Score \ OPTTG Trauma Score	I	II	III	Percent Agreement
I	16	1	3	80%
II	2	20	1	87%
III	1	51	174	77%

Of the 51 patients that were under-triaged, failing to account for age + anticoagulation use and altered mental status were the most commonly missed comorbidities by EMS

CONCLUSION

- Agreement between EMS and OPTTG trauma priority designation occurred among priority 1 and priority 2 traumas at 80% and 87% respectively.
- Disagreement between EMS and OPTTG trauma priority designation occured in failure to recognize trauma score level 2.
- Fifty-one patients of the 226 that were originally run as designated priority 3 trauma by EMS eventually qualified as priority 2 due to overlooked comorbidities of age + anticoagulation and altered mental status.
- Of the 269 patients, 20% of the patients were under-triaged which does not meet standards for trauma triage by ACSCOT.[1]
- Further education is needed for EMS providers to avoid undertriage of trauma patients.

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