



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.

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

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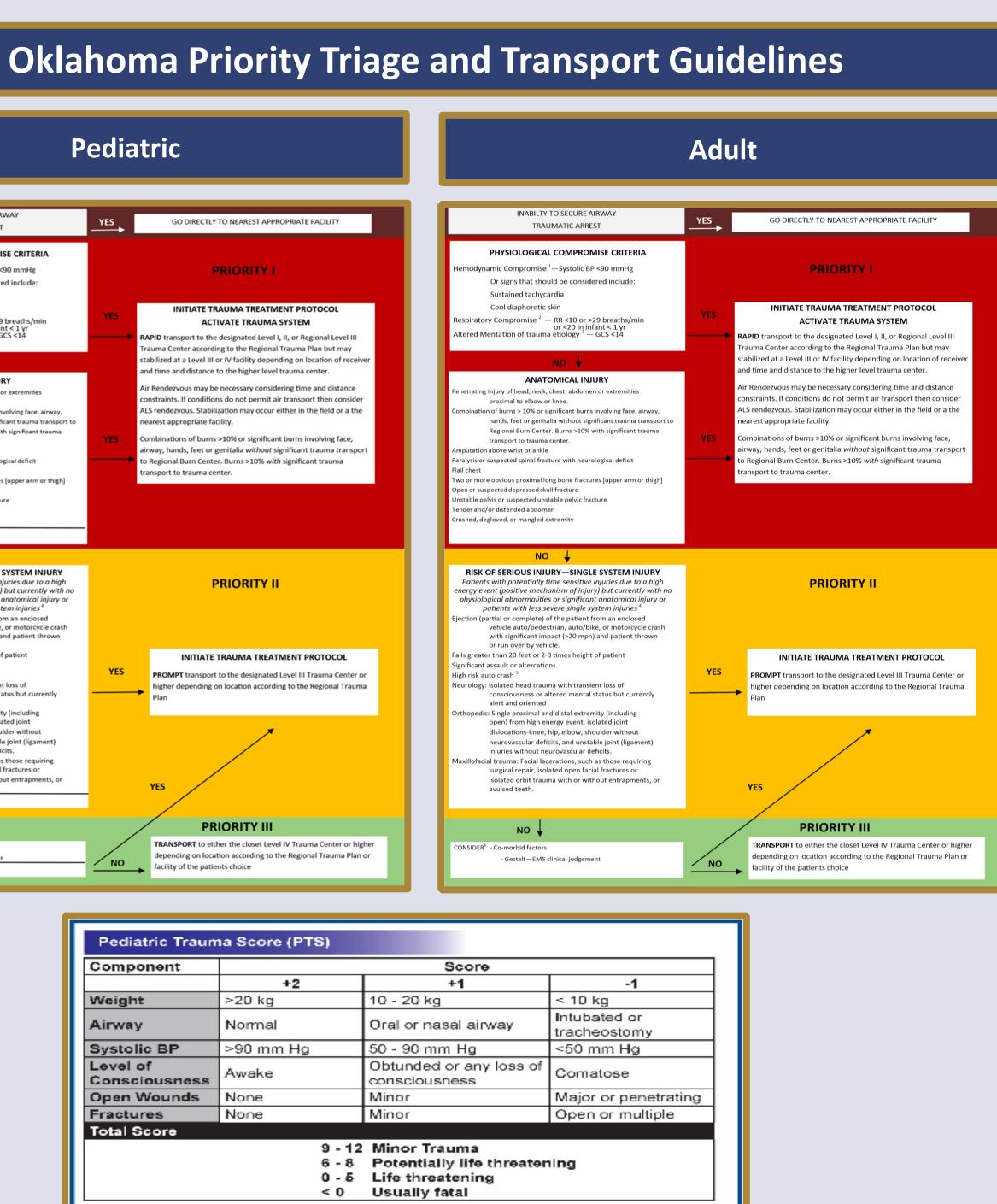
METHODS

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.

| INABILTY TO SECURE AIRWAY TRAUMATIC ARREST | YES | GO DIRECTLY TO NEAREST APPROPRIATE FACILITY |
|---|-----|--|
| PHYSIOLOGICAL COMPROMISE CRITERIA lemodynamic Compromise ³ —Systolic BP <90 mmHg Or signs that should be considered include: Sustained tachycardia | | PRIORITY I |
| Cool diaphoretic skin espiratory Compromise ² — RR <10 or >29 breaths/min or <20 in infant <1 yr Itered Mentation of trauma etiology ³ — GCS <14 | YES | INITIATE TRAUMA TREATMENT PROTOCOL ACTIVATE TRAUMA SYSTEM RAPID transport to the designated Level I, II, or Regional Level III Trauma Center according to the Regional Trauma Plan but may |
| NO 🕂 | | stabilized at a Level III or IV facility depending on location of receiver and time and distance to the higher level trauma center. |
| ANATOMICAL INJURY enetrating injury of head, neck, chest, abdomen or extremities proximal to elbow or knee. ombination of burns > 10% or significant burns involving face, airway, hands, feet or genitalia without significant trauma transport to Regional Burn Center. Burns >10% with significant trauma transport to trauma center. mputation above wrist or ankle aralysis or suspected spinal fracture with neurological deficit all chest wo or more obvious proximal long bone fractures [upper arm or thigh] pen or suspected depressed skull fracture | YES | Air Rendezvous may be necessary considering time and distance constraints. If conditions do not permit air transport then consider ALS rendezvous. Stabilization may occur either in the field or a the nearest appropriate facility. Combinations of burns >10% or significant burns involving face, airway, hands, feet or genitalia <i>without</i> significant trauma transport to Regional Burn Center. Burns >10% <i>with</i> significant trauma transport to trauma center. |
| Instable pelvis or suspected unstable pelvic fracture ender and/or distended abdomen rushed, degloved, or mangled extremity Pediatric Trauma Score ≤ 5 | - | |
| № 🖌 | | |
| RISK OF SERIOUS INJURY—SINGLE SYSTEM INJURY Patients with potentially time sensitive injuries due to a high energy event (positive mechanism of injury) but currently with no physiological abnormalities or significant anatomical injury or patients with less severe single system injuries ⁴ Ejection (partial or complete) of the patient from an enclosed vehicle auto/pedestrian, auto/bike, or motorcycle crash with significant impact (>20 mph) and patient thrown or run over by vehicle. | | PRIORITY II |
| Falls greater than 20 feet or 2-3 times height of patient | | INITIATE TRAUMA TREATMENT PROTOCOL |
| Significant assault or altercations High risk auto crash ⁵ Neurology: Isolated head trauma with transient loss of consciousness or altered mental status but currently alert and oriented Orthopedic: Single proximal and distal extremity (including | YES | PROMPT transport to the designated Level III Trauma Center or higher depending on location according to the Regional Trauma Plan |
| open) from high energy event, isolated joint dislocations-knee, hip, elbow, shoulder without neurovascular deficits, and unstable joint (ligament) injuries without neurovascular deficits. Maxillofacial trauma: Facial lacerations, such as those requiring surgical repair, isolated open facial fractures or isolated orbit trauma with or without entrapments, or avulsed teeth. Pediatric Trauma Score 6-8 | | YES |
| | | |
| NO 🕇 | | PRIORITY III |
| | | TRANSPORT to either the closet Level IV Trauma Center or higher |
| CONSIDER ⁶ - Co-morbid factors - Gestalt—EMS clinical judgement | NO | depending on location according to the Regional Trauma Plan or |

| Pediatric Traum | a Score (PT | S) | |
|-----------------|-------------|-----------|-----------|
| Component | | | |
| | +2 | | |
| Weight | >20 kg | 10 - 20 k | |
| Airway | Normal | | Oral or r |
| Systolic BP | >90 mm Hg | 50 - 90 r | |
| Level of | Awake | | Obtunde |
| Consciousness | Awake | | consciou |
| Open Wounds | None | | Minor |
| Fractures | None | | Minor |
| Total Score | | | |
| | | 9 - 12 | Minor T |
| | | 6 - 8 | Potenti |
| | | 0-5 | |
| | | < 0 | Usually |
| | | | |

- Our preliminary data consisted of 1,300 trauma patient charts, of which 269 complete, we anticipate n=3,600.
- The most common mechanisms of injury were same level fall (53.5%), MVC (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 the two most commonly missed determinants.

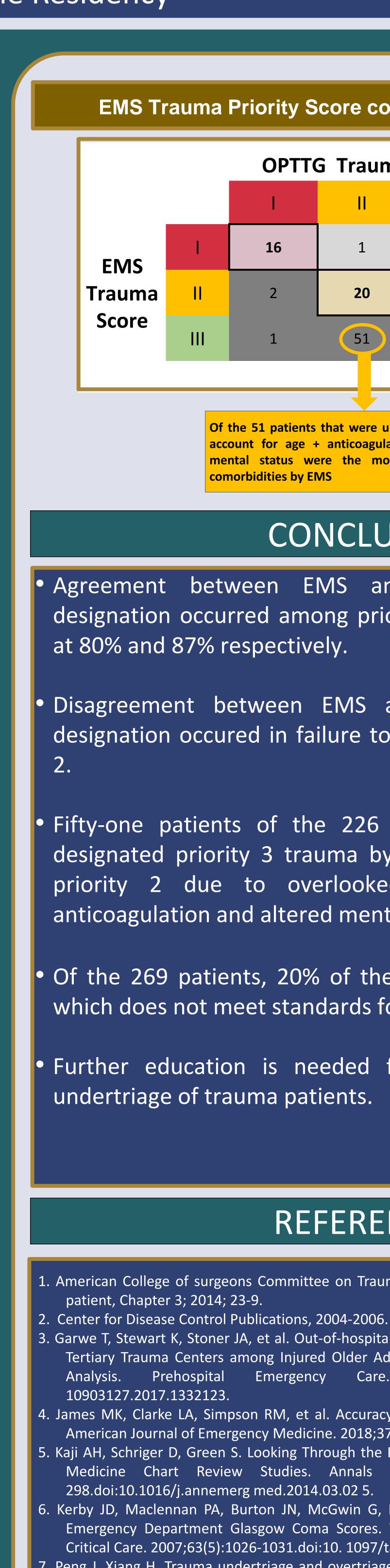


RESULTS

patients had a listed trauma priority designation by EMS. When the study is

(18.97%), assault by other mechanism (11.37%) and assault by stabbing

years with concurrent anticoagulation use and altered mental status were





EMS Trauma Priority Score compared to OPTTG scoring **OPTTG** Trauma Score Percent Agreement 80% 87% 20 77% 174

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

 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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