

BACKGROUND



- Quality of pre-hospital care impacts hospital dispositions and patient outcomes. Emergency Health Services (EMS) are the first responders to many patients who end up in the hospital. They are trained to employ a set of important practical skills that can help patients in the field.
- The effectiveness of EMS' use of on-scene life saving modalities has not been fully explored.
- The longer average response time of rural EMS calls compared to urban EMS calls has been implicated in worse outcomes [1].
- In one study, patients who had longer response times within any type of community were shown to have worse outcomes [2, 3].
- Some studies have not found a significant link between response time and outcomes. One study examined the validity of the 8 minutes or less gold standard of EMS calls and didn't find better outcomes when within this time frame [4].

RESEARCH QUESTIONS

1. Within the foundation of an EMS call, do different time variables (i.e. total time of call, time at scene, time to hospital) have an effect on discharge disposition at the hospital and do these effects differ from each other?
2. Does the time that EMS spends in different parts of the emergency call affect patient discharge outcomes?
3. Is there benefit to treating in the field instead of traveling to the hospital as soon as possible?

METHODS

- Predictor variables:** total time of call, time at scene, time to hospital, type of injury sustained, demographic characteristics (age, race, sex)
- Outcome variables:** discharge disposition
- Patients were grouped based on discharge disposition: Group 1: Against Medical Advice (AMA) or Discharged Home, Group 2: Discharged to Alternate level of care, Group 3: Died.
- Statistical analyses (via IBM SPSS Version 27) included descriptive analysis of demographic and characteristics, as well as recoded discharge disposition. Non-parametric testing with the Kruskal-Wallis test was used to evaluate relationship between EMS time variables and patient discharge disposition.

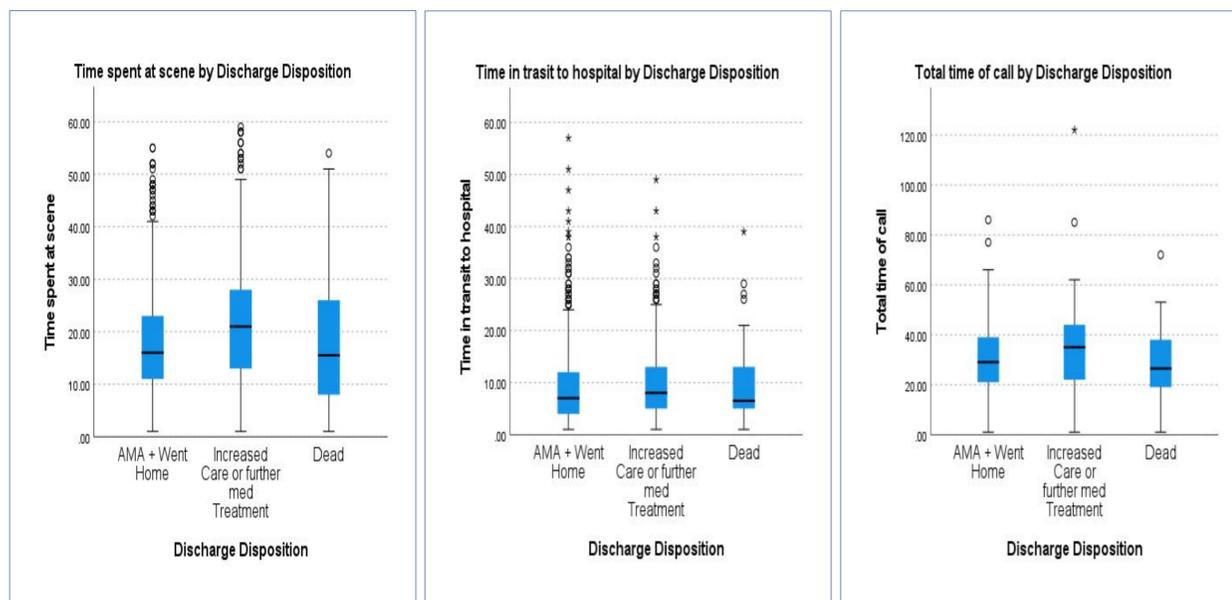
RESULTS

Table 1. Characteristics of St. Barnabas Hospital Patient Sample (N=3068)

Characteristic	Count (%)
Sex	
Male	2135 (69.6%)
Female	933 (30.4 %)
Race	
Black	1546 (50.4%)
White	1219 (39.7%)
Asian	23 (0.7%)
American Indian	5 (0.2%)
Native Hawaiian or Other Pacific Islander	2 (0.1%)
Other	273 (8.9%)

Table 2. EMS Response Times

Parameter	Mean (minutes)	Min-Max (minutes)
Time spent at scene	18.42	1-59
Time spent in transit to hospital	8.9	1-57
Total time of call	30.22	1-122



RESULTS CONT'D

- Patient's (n=3068) mean age was 49 years; 69.6% identified as male, 30.4% as female; 50.4% identified as Black, 39.7% as White, and 19.9% as Other Race.
- Regarding Hospital Disposition, 1923 (62.7%) patients were discharged as AMA/went home, 1057 (34.5%) patients needed further medical treatment, and 88 (2.9%) patients died in the hospital.
- Patients who were disposed to further medical treatment had longer time spent at the scene (21 mins) compared to patients who went home (16 mins) or died in hospital (15.5 mins) (p<0.001).

DISCUSSION

- The three variables used in this study (total time spent at scene, total time in transit to hospital, and total time of call) are significant predictors of hospital discharge disposition.
- Our study found that EMS spent more time on scene for patients who were eventually admitted to the hospital for further treatment. Additionally, EMS spent less time on scene for patients who died in the hospital.
- Perhaps this is because EMS recognized when on scene treatment was necessary or futile based on the acuity of the patient's injuries.
- This does not imply that EMS should spend less time at the scene of any patient, rather, it shows that faster EMS response time does not always translate to better patient outcomes.
- Previous studies have found that EMS transit times of less than 4 minutes result in improved patient outcomes when there is a moderate to high risk of mortality, but that transit times greater than 8 minutes did not impact patient survival [4].
- This further supports our results and emphasizes the importance of future studies, which could further analyze the acuity of the patient's injuries at the scene.
- This relationship could also be further examined by creating a logistic regression model that incorporates other variables such as Glasgow Coma Scale or Abbreviated Injury Scale and try to determine the relative independent contribution of EMS transport times to patient outcomes.

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