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SYSTEMATIC REVIEW-META-ANALYSIS

Emergency Medical Services

How do current police practices impact trauma care in the prehospital setting? A scoping review

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Abstract

Objective: In the United States, police are often important co-responders to 911 calls with emergency medical services for medical emergencies. To date, there remains a lack of a comprehensive understanding of the mechanisms by which police response modifies time to in-hospital medical care for traumatically injured patients. Further, it remains unclear if differentials exist within or between communities. A scoping review was performed to identify studies evaluating prehospital transport of traumatically injured patients and the role or impact of police involvement.

Methods: PubMed, SCOPUS, and Criminal Justice Abstracts databases were utilized to identify articles. English-language, US-based, peer-reviewed articles published on or prior to March 30, 2022 were eligible for inclusion.

Results: Of 19,437 articles initially identified, 70 articles were selected for full review and 17 for final inclusion. Key findings included (1) current law enforcement practices involving scene clearance introduce the potential for delayed patient transport but to date there is little research quantifying delays; (2) police transport protocols may decrease transport times; and (3) there are no studies examining the potential impact of scene clearance practices at the patient or community level.

Conclusions: Our results highlight that police are often the first on scene when responding to traumatic injuries and have an active role via scene clearance or, in some systems, patient transport. Despite the significant potential for impact on patient well-being, there remains a paucity of data examining and driving current practices.

KEYWORDS
bias, blunt, emergency medical services, penetrating, police, prehospital, scene clearance, transport, trauma

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1 | INTRODUCTION

1.1 | Background

The cascade of events that follows a call to 911 can be complex, including dispatch of emergency medical services (EMS), police, and fire. Police are often first on the scene for various health emergencies such as mental health crises, cardiac arrest, and traumatic injuries and can play an important role in time-critical conditions.[1] In the case of trauma patients, critical components of a patient's time to emergency department (ED) arrival are the time it takes for EMS personnel to arrive on scene, on-scene time, and the time it takes to reach a hospital for definitive medical care. Some communities have leveraged the early arrival of police through the implementation of "scoop and run" protocols, allowing police to transport patients to a hospital without waiting for EMS arrival, potentially reducing transport time.[2,3]

Alternatively, given the unpredictable nature of the prehospital environment, EMS contact with a patient may be delayed by a police practice termed "scene staging" (Figure 1). This occurs when the information provided to the 911 dispatcher leads them to believe a scene may be potentially unsafe (eg, posing a potential threat of physical harm to others, including first responders). In these cases, responding EMS staff are often "staged" a distance away from the location of the incident until the police "secure the scene" and allow EMS to access the patient.[4]

1.2 | Importance

Improvements in outcomes following traumatic injury hinge on minimizing time to definitive management, comprising of 2 components: (1) prehospital transport time, and (2) in-hospital time to definitive management.[5] Although in-hospital time remains a critical component of this timeline, our presented review focuses on the prehospital phase of care. Current evidence suggests the effectiveness of prehospital treatment for traumatic injuries remains largely limited to control of life-threatening bleeding—especially for patients experiencing penetrating trauma—and rapid transport to an ED is a critical determinant of survival.[6–9] As improvements have been made in prehospital transport systems, the role of police in prehospital trauma care remains widely variable and not well characterized. This may range from scene staging before medical evaluation, a process that is largely unstandardized and unmeasured, to rapid police transport of patients.

Further, it is important to consider community characteristics that may impact prehospital care. For example, some studies have demonstrated longer transport times for Black and Hispanic patients and people from low-income and rural neighborhoods, as well as transportation to less-resourced hospitals.[10–13] However, despite a growing body of research demonstrating inequities in both healthcare and policing practices in low-income and/or communities of color, it is unknown if scene-staging or police transport for trauma patients have similar disparities.

1.3 | Goals of this investigation

To address these knowledge gaps, we conducted a scoping review to characterize available evidence regarding the impact of police practices on prehospital trauma care. Specifically, we sought to answer: (1) what are the mechanisms by which police presence on-scene may impact prehospital emergency care; (2) what impact do police prehospital practices, including scene clearance or scoop and run protocols, have on transport times and trauma outcomes, such as mortality; and (3) is there evidence to suggest differences in police prehospital care or transport times by race, socioeconomic status, or community (eg, zip-code level) characteristics?

2 | METHODS

2.1 | Study design and search strategy

All stages of this scoping review were informed by PRISMA-ScR guidelines. A medical research librarian was consulted in the development and revision of the final search strategy. A search of the literature was conducted from inception through March 30, 2022 to identify relevant studies. Themes were structured to include policing, EMS, disparities, and other relevant terms. Notably, this included terms around mass casualties to capture potential variations in scene clearance and transport mechanisms that may inform general practice. The final PubMed search strategy is shown in Appendix 1 and adapted for translation to SCOPUS. Because our study questions were directly related to

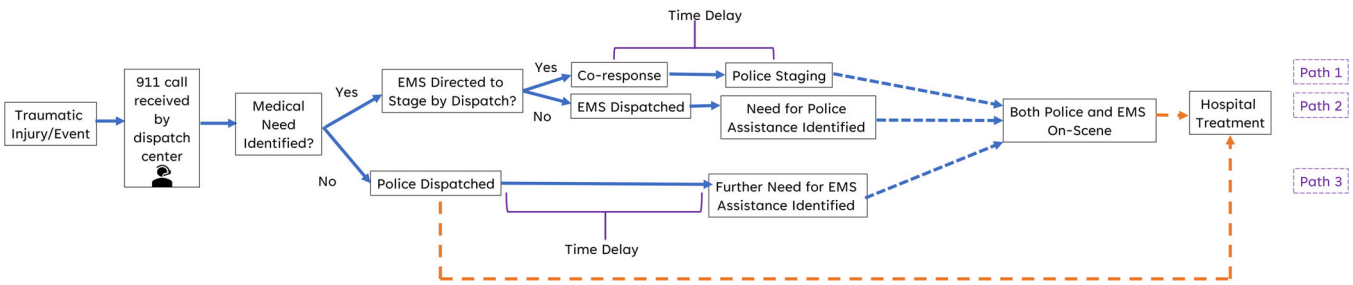

FIGURE 1 Figure depicting pathway/potential avenues for police impact on time.

police involvement, search results located through the Criminal Justice Abstracts database were also included.

2.2 | Study selection

All English-language, US-based, peer-reviewed articles published on or prior to March 30, 2022, were eligible for inclusion. All articles captured by the search strategy underwent title and abstract screening for inclusion by 2 reviewers (RAS and SI). Articles were deemed eligible for full review if (1) there was explicit mention regarding the role of police in the prehospital setting; or (2) police involvement in prehospital trauma times were evaluated; or (3) the title or abstract suggested that items 1 or 2 may be discussed in the full body of the text. Given that the primary study question of interest was specific to prehospital transport of injured patients in the United States, a process that varies widely even among US communities, international studies were excluded from review.

2.3 | Data extraction and synthesis

The initial data abstraction tool was drafted with input from all study team members. This was further refined after focused feedback from methodological experts not directly involved in the study project. The preliminary version of the tool was then validated on 2 articles preselected for inclusion by 3 reviewers (RAS, SI, BdS). Abstraction elements were edited for clarity-based on feedback on the validation articles and the final version was subsequently used to complete the remainder of the abstraction (Appendix 2). Articles selected for full review were compiled into a central database. Review and data abstraction included a team of 3 reviewers (RAS, SI, BdS), therefore each article was independently reviewed by 2 reviewers, with discrepancies and questions brought to the full team for consensus.

2.4 | Outcomes

Articles selected for full review were categorized into 2 main categories based on the potential mechanism of influence on transport times—those examining police involvement that have potential for prolonged transport times secondary to on-scene practices (n = 5) and those examining the potential for more rapid transport times by utilizing police transport of injured patients (n = 12) (Table 1). Details regarding the study site, data sources, analyses completed, and results were abstracted using the finalized data abstraction tool.

3 | RESULTS

Following completion of the initial search and removal of duplicates, 19,437 articles were identified for title/abstract review (Figure 2). Full review was completed for 70 identified articles, with 17 articles meeting inclusion criteria. Primary reasons for exclusion included: lack of relevance to the study question, commentary article without data, based outside the United States, or lack of peer review. One article that met inclusion criteria was reviewed, but ultimately excluded as it reported registry data that were analyzed in more detail in other included articles.[14]

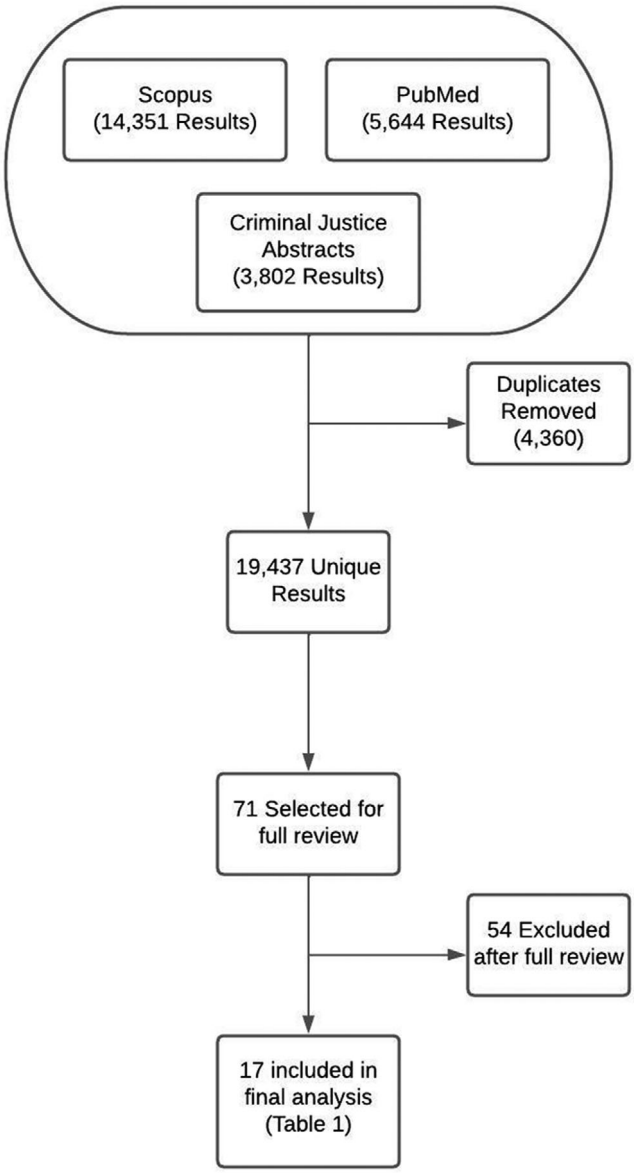

FIGURE 2 PRISMA flowsheet.

3.1 | Characteristics of included studies

Most articles identified were quantitative studies completed as secondary data analyses (n = 14; 88%; Table 1). One study prospectively collected data through third-person ride-along with EMS. One study analyzed previously collected qualitative data of the experiences of Black trauma patients. One study utilized a mixed methods approach with quantitative data from an existing trauma registry paired with original qualitative interviews. With respect to geographic variation,

TABLE 1 Characteristics and descriptions of included studies.

Title	Authors	Brief summary	Sample size and data source
Scene clearance			
Delay in ambulance dispatch to road accidents	Brodsky, 1992	N = 3290 fatal accidents; N = 15,584 injury accidents. EMS delay was 5–50 min for 18.2% of fatal accidents and 32% of injuries determined "fatal" or "disabling" by police.	N = 18,874; single state accident data
Ambulance arrival to patient contact: the hidden component of prehospital response time intervals.	Campbell et al, 1993	Primary data collection from direct observation of high-acuity calls in one urban EMS system. Barriers to EMS access to the patient were considered and found that any barrier increased time by 1.5 min. Police secured the scene in 12% of cases and was associated with the single longest time delay (38.7 min).	N = 216; single urban EMS system
Ambulance staging for potentially dangerous scenes: another hidden component of response time	Gratton et al, 2010	Retrospective cohort study. Calls were 7.1% staged and 92.9% non-staged. Staging added 4.5 min to response time. High-acuity patients accounted for similar proportions of staged and non-staged calls.	N = 62,157; single Midwestern EMS system
A descriptive analysis of care provided by law enforcement before EMS arrival in the United States	Klassen et al, 2018	Descriptive analysis of calls received care prior to EMS arrival (2% with care provided by police). Patients receiving care by police tended to be younger, male, and white/Asian as compared to those receiving care by non-police. Conditions were more likely to be cardiac arrest or traumatic injury.	N = 1,720,923; National EMS Information System
Use of emergency medical services by police	Strote et al, 2018	Single system retrospective cohort study. Sample of calls made by police requesting EMS backup (2.2% of all police calls). A total of 61.2% of these calls resulted in transport to the hospital.	N = 4792; single city EMS system
Police transport			
Association between mode of transportation and survival in adult trauma patients with penetrating injuries: matched cohort study between police and ground ambulance transport	Abou Arbid et al, 2022	Retrospective matched cohort study of the penetrating trauma patients. Survival to hospital discharge was similar for patients transported for both police and EMS (92.7% vs. 94.5%).	N = 733; National Trauma Data Bank
Injury-adjusted mortality of patients transported by police following penetrating trauma	Band et al., 2011	Secondary analysis of penetrating trauma patients receiving care at a Level I trauma center were identified. 27% were transported by police, who were more likely to be male and more severely injured. No mortality difference was identified in adjusted analyses.	N = 2127; Pennsylvania Trauma Outcomes Study
Severity-adjusted mortality in trauma patients transported by police	Band et al, 2014	Secondary analysis of penetrating trauma patients. 28.2% were transported by police, who were more likely to be male and more severely injured. No mortality difference was identified in overall adjusted analyses, though subgroup analysis of severely injured patients showed improved mortality with police transport.	N = 4122; Pennsylvania Trauma Outcomes Study
Urban trauma transport of assaulted patients using nonmedical personnel	Branas et al, 1995	Secondary analysis of trauma patients, with police transporting 29%. Nonmedical police transport is largely equivalent to EMS transport for trauma patients but may be confounded by severity of patients transported.	N = 4767; Pennsylvania Trauma System Foundation
A safe haven for the injured? Urban trauma care at the intersection of healthcare, law enforcement, and race	Jacoby et al, 2017	Secondary analysis of 2 qualitative studies carried out in Philadelphia Trauma System. Black trauma patients with police interactions during medical care. Themes identified included both positive (safety, rapid transport) and negative (dehumanization, delay of care for police search) attributes.	N = 24
Beyond survival: The broader consequences of prehospital transport by police for penetrating trauma	Jacoby et al, 2020	Mixed methods study utilizing secondary data and qualitative interviews with patients, police, and trauma clinicians ($N = 22$). Neighborhood level factors independently associated with police transport include % Black population and % vacant housing units. In qualitative interviews, all stakeholders identified speed as the primary advantage. Disadvantages included insecurity during transport, occupation health risks, and complication of hospital workflow.	N = 9438; Pennsylvania Trauma Outcomes Study

(Continues)

TABLE 1 (Continued)

Title	Authors	Brief summary	Sample size and data source
Patient characteristics and temporal trends in police transport of blunt trauma patients: a multicenter retrospective cohort study	Kaufman et al, 2017	Secondary analysis of bluntly injured trauma patients included with 8% transported by police. Odds of police transport were significantly higher for patients who were male, Black, or Asian. 64% had conditions that may have been amenable to EMS intervention.	N = 36,460; Pennsylvania Trauma Outcomes Study
Police transport of firearm-injured patients—more often and more injured	Maher et al, 2021	Retrospective cohort study of patients with gunshot wounds. Patients transported by police were more critically ill and required more advanced medical interventions but had similar in-hospital mortality.	N = 2007; single trauma center
Association between mode of transportation and survival in adult trauma patients with blunt injuries: matched cohort study between police and ground ambulance transport	Sakr et al, 2021	Retrospective matched cohort study of the blunt trauma patients in National Trauma Data Bank. Survival rate for patients transported by either police or EMS was high (99.2%) and not statistically significantly different.	N = 2469; National Trauma Data Bank
An analysis of police transport in an Eastern Association for the Surgery of Trauma Multicenter Trial examining prehospital procedures in penetrating trauma patients	Taghavi et al, 2021	Multi-center prospective observational trial of adult, propensity-matched, proximal penetrating trauma patients from 25 participating trauma centers. Of patients included, 92.3% came from Philadelphia. No difference in outcomes was identified between police and EMS.	N = 588; multi-center
Police transport versus ground EMS: a trauma system-level evaluation of prehospital care policies and their effect on clinical outcomes	Wandling et al, 2016	Secondary analysis of penetrating trauma patients transported by police, with 88% occurring in just 3 cities using 'scoop and run' protocols (Philadelphia – 60.6%, Sacramento – 21.1%, Detroit – 6.2%). No mortality difference was identified in adjusted analyses.	N = 2467; National Trauma Data Bank
Association of police transport with survival among patients with penetrating trauma in Philadelphia, Pennsylvania	Winter et al, 2021	Secondary analysis of patients with penetrating traumatic injuries. A matched cohort analysis revealed that patients transported by police were less likely to be dead on arrival, although there no difference in overall mortality between patients transported by police vs. EMS.	N = 3013; Pennsylvania Trauma Outcomes Study

9 studies were based on or used data from Pennsylvania, 1 of which was conducted as a multicenter trial utilizing 25 different trauma centers, but ultimately drew 92.3% of the study sample from Philadelphia.[15] Of the remaining 8 articles, 4 were single-site studies not based in Pennsylvania, 3 used the National Trauma Data Bank (NTDB), and 1 used the National Emergency Medical Services Information System (NEMSIS).

3.2 | Potential for delay/on-scene practices

Of the 5 articles that explored the potential for on-scene practices leading to delay of EMS arrival to the injured patient, 3 articles reported potential delay through 2 distinct mechanisms. First, additional delay may be incurred through the routine process of staging (Figure 1, path 1) or through other barriers encountered by EMS (eg, locked doors, bystanders).[4,16] Second, if a call is not initially recognized as needing EMS, police may be the only responder dispatched to the scene—with delay including time required to recognize the need for medical treatment[17] (Figure 1, path 3).

Two articles directly measured the time required to stage a scene in their system, identifying its occurrence for 7%–12% of emergency calls.[4,16] Median estimates suggested that this process added 1.3–10.9 min to EMS response time.[4,16] One study measuring factors delaying EMS arrival to the patient noted that police scene clearance was associated with the single longest observed time delay of 38.7 min, although this was limited to 1 event.[16] A third study documented delays of up to 50 min in police notification of EMS when dispatched to road accidents thought initially not to need EMS.[17] For cases appearing to be fatal or disabling, 31.8% experienced a delay between 5 and 50 min. When considering care rendered on-scene, 1 descriptive study reporting unadjusted aggregate data was identified. In this analysis, police accounted for 2% of care rendered before EMS arrival and tended to be patients who were male and White or Asian.[18]

3.3 | Police as prehospital transport

The second major theme identified was the utilization of police to transport injured patients to an ED, without waiting for EMS arrival. This accounted for most articles identified in this review (n = 12). Based on available literature, approximately 60% of all patients transported by police are localized to the City of Philadelphia. Combined, 3 cities

(Philadelphia, Sacramento, and Detroit) account for approximately 88%.[19]

Eleven of the 12 articles compared police and EMS transport of trauma victims. Of these, 8 articles evaluated transport for penetrating trauma, 2 articles evaluated transport for blunt trauma, and 1 article evaluated both. No differences were found in mortality between EMS or police transport.[20–24] One study estimated that 64% of patients transported by police in Philadelphia may have benefited from prehospital interventions typically provided by EMS, such as intravenous fluids, spinal immobilization, or endotracheal intubation.[25]

Qualitative work involving Black trauma patients transported by police observed mixed responses.[26,27] Although some patients found police transport to be a positive experience, improving their transport times and serving as evidence of public service, others described it as "dehumanizing" and emotionally traumatic.[23] Other concerns included a lack of precautionary measures (eg, spinal precautions) and occupational hazard to police of transporting patients without appropriate training or equipment, including personal protective equipment.

3.4 | Differential practices by race of patient requiring transport to ED

No articles specifically evaluate racial, socioeconomic status, or community-level differences in scene staging or transport times as their primary question. However, several articles provided stratification by race. Of the analyses that were not matched cohorts, 7 articles (1 "on-scene practice" and 6 "police transport") provided data regarding the distribution of race within their study sample. Four articles provided only unadjusted associations, of which 3 found that Black patients were more likely to be transported by police and 1 found no statistical difference by race.[15,18,19,28] Of the 3 articles providing adjusted analyses, all showed persistence of increased odds of transport by police for Black patients.[25,27,29] This remained true when also adjusting for neighborhood-level characteristics, including assault rate and vacant housing units.[27]

4 | LIMITATIONS

The presented scoping review has several limitations worth noting. Given the significant heterogeneity of prehospital care globally, our analysis focused on domestic studies to improve generalizability to the US population. However, it excluded data from other countries with robust prehospital transport protocols. Additionally, most police transport occurs in Philadelphia, potentially limiting the generalizability of the available evidence for scoop and run protocols. Given the paucity of published literature, our search was intentionally structured to be inclusive and thus was not limited to methodology. This approach allowed us to identify data related to our study questions but limited our ability to aggregate study findings beyond the presented identified themes. Finally, our scope for this manuscript is limited to patient-level and community-level race and socioeconomic data. Although allowing for a more narrowed scope, it does not address other potentially important characteristics, such as gender, religion, or age, among others. Despite these limitations, the data provide a critical foundation on which future research can be anchored.

5 | DISCUSSION

Our completed scoping review identified 17 articles describing the impact of police on trauma transport times. Specifically, we identified 3 primary mechanisms through which this may be mediated: scene clearance protocols, scoop and run protocols, and delayed recognition of medical need (Figure 1). Overall, our study notes a marked paucity of information, particularly with respect to scene clearance practices and delayed EMS activation, including whether disparities exist. The limited available data suggest that scene staging may delay medical care, whereas scoop and run police transport protocols may expedite time to care. Notably, the preponderance of data on scoop and run protocols is derived from the city of Philadelphia.

Given that current literature suggests that scoop and run protocols may be localized to a few cities, the primary mechanism of police impact on trauma transport time for most communities lies in the process of scene clearance. Our results suggest that scene clearance may occur for a sizable proportion of emergent trauma calls, introducing the potential for delayed EMS evaluation for up to nearly 40 min.[4,14,16] Further, in cases where medical need is not identified at the time of dispatch, police may be responsible for recognizing this and activating EMS after their arrival.[17] These delays warrant further investigation given the time-dependent nature of traumatic injuries. No studies were found explicitly examining scene clearance practices or differential application by demographic characteristics.

In contrast to scene clearance, the implementation of scoop and run transport protocols may decrease transport times to the emergency department, resulting in similar patient outcomes for trauma victims. Although the majority of the data identified in this review originates from Philadelphia, other cities such as Chicago, Cleveland, Detroit, and Sacramento have expanded the role of police to trauma victim transport.[19] The few studies identified here suggest no mortality difference between police or EMS transport when considering blunt or penetrating trauma patients. However, police were noted to transport a more severely injured group including patients who may have otherwise expired in the field, suggesting they engage in some form of implicit on-site triage to appropriately identify and transport higher-acuity patients.[25] Yet, findings from our review also note limitations in the ability to identify who is appropriate for rapid transfer and the potential missed benefit of stabilizing treatment rendered by EMS for blunt trauma patients transported by police.[25]

Logistically, patients that are transported in the back of a police vehicle are unable to receive basic interventions (eg, intravenous fluids, pain medication) and may be more likely to be physically uncomfortable. Although patients and providers identify speed of transport by police as a positive aspect of such protocols, examining patients' experiences of scoop and run practices, and their acceptance of police in the medical space, are equally important.[26,27]

This is particularly important given that communities may interface differently with police. Patients of Black, Latinx, and Indigenous descent are significantly more likely to have had prior harmful experiences with law enforcement, which may cultivate a lack of trust in both law enforcement and the healthcare system.[28,30–35] Two studies in our review found that some patients described police being aggressive to them in seeking information, failing to consider their wellbeing, and experiencing new distress with police presence.[26,27] We found no other examinations of patient experiences of police following traumatic injury, along with no rigorous research to evaluate if current police practices contribute to disparities in transport times. Although scoop and run protocols may promote community relations and boost trust in law enforcement, continued inquiry including patients, clinicians, and police is needed to explore this hypothesis.[36,37]

Our findings highlight a critical need for improved systems of data collection. Many of the reviewed studies were unable to directly measure time intervals due to absent variables within their datasets. Although progress has been made with registries such as the NEMSIS,[38] the quality of data collected is widely variable and often limited.[39,40] Despite this limitation, the current EMS data collection structure offers an important resource and potential for advancements such as automated (eg, GPS-derived) time stamps and expansion toward an integrated system inclusive of all first responders rendering medical care. These data can, in turn, be used to identify community-specific needs, such as protocol development and co-response training.

Many aspects of prehospital care (eg, EMS transport times, helicopter transport, rural access, lights, and sirens) have been studied to improve patient outcomes and address health disparities.[41–44] However, data evaluating the impact law enforcement may have on prehospital transport times, time to EMS care or medical evaluation, and patient outcomes are scarce. It is imperative to better this early, yet potentially critical, step in the chain of survival for trauma care given that law enforcement is often first on-scene for trauma victims.

Police are often the first on-scene when responding to traumatic injuries and have an active role via scene clearance or, in some cities, patient transport. Despite the significant potential for impact on patient well-being, there remains a paucity of data examining and driving current practices. The way in which current police practices impact time to definitive medical care and outcomes for trauma patients is unclear. EMS systems are uniquely positioned to identify opportunities for collaboration with law enforcement to establish best practices for trauma scene management to optimize patient outcomes. Understanding their role in prehospital transport, relationships with EMS, and interactions with patients, including those in marginalized communities is critical to providing timely and appropriate care for all victims of trauma.

AUTHOR CONTRIBUTIONS

RAS and MH conceived of and designed the study. Content expertise was provided by GCS. RAS and SI completed searches and initial title/abstract reviews. RAS, SI, and BdS completed full manuscript reviews. RAS drafted the manuscript. All authors contributed substantially to its revision.

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CONFLICTS OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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