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## ORIGINAL ARTICLE

## Views of emergency care providers about factors that extend on-scene time intervals

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## ABSTRACT

**Introduction:** Rapid response, patient care and transportation remain recognised goals of the Emergency Medical Services (EMS). Spending more time on-scene may delay the initiation of definitive care interventions. This study focused on describing the perceptions of a sample of emergency care providers regarding the impact of environmental, clinical and systemic factors with respect to their on-scene time intervals.

**Method:** The study was descriptive and prospective in nature making use of a self-designed questionnaire. Basic descriptive methods were used during the analysis of the participants' responses to 16 close-ended questions. A further review of the limited narrative elicited by two open-ended questions allowed for the reporting of additional views and opinions.

**Results:** Thirty-three (92%) participants agreed that extended time on-scene may negatively affect patient outcome. Twenty-three (64%) agreed that spending longer than 20 min on-scene may be considered excessive for medical emergencies and 28 (77%) felt the same for trauma cases. Respondents felt that many of the environmental, clinical and systemic factors mentioned in the questionnaire do have the potential to extend on-scene time intervals. The factors that were seen to have the greatest effect included waiting for fire, rescue and police services, patient acuity, the use of an air ambulance, patient extrication and multi-casualty incidents.

**Discussion:** There are a number of environmental, clinical and systemic factors that emergency care providers indicate have the potential to extend on-scene time intervals. Acknowledging and attempting to address these factors is important for EMS as limiting the time spent on-scene is not only clinically desirable but may also lead to improved efficiency and availability of resources.

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## African relevance

- The concept and applicability of the *golden hour* in the African context is contentious and clinically relevant.
- EMS service delivery and EMS system functioning are uniquely experienced in the African region.
- Differences are highlighted in local versus international practices regarding on-scene time intervals.

## Introduction

South African Emergency Medical Services (EMS) has had a gradual movement away from the 1980s doctor-driven, Franco-German model toward an Anglo-Saxon model characterised by a

self-regulated autonomous emergency care profession. South African Emergency Care Practitioners now register and function as independent clinicians/practitioners. Consequently in South Africa, the responsibility for clinical decision-making, interrogation, critique and development of prehospital medical protocols and direction is now largely driven and owned by South African paramedics themselves [1].

Regardless of the system or model followed, rapid transportation of the ill and injured remains a recognised cornerstone of EMS. Proponents of the golden hour, or scoop and shoot approach based their arguments around a belief that patients who have sustained a traumatic injury may have an improved outcome if they reach an appropriate facility able to provide definitive care within one hour of the initial insult [2]. However, such views have become increasingly interrogated leading to literature that questions the current validity and applicability of the golden hour concept [3].

Having said this, certain time-sensitive medical conditions such as cardiac and respiratory arrest, stroke, acute coronary syn-

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dromes, penetrating trauma and seizures have been identified where patient outcomes may be negatively affected by long on-scene times [2,4,5]. The on-scene time interval is considered to begin once the emergency care provider arrives at the incident and ends when they depart for the receiving facility. It is during this on-scene time interval that activities such as incident assessment, patient access, patient assessment, treatment, packaging and removal are conducted [6]. Aside from being clinically desirable for certain high acuity cases, limiting the time spent on-scene may also lead to improved efficiency and availability of resources within an EMS system.

Due to the diverse, and often uncontrolled nature of the pre-hospital emergency care environment, there are many factors that can effect on-scene time intervals. Boyle (in 2012) classified these factors into three broad categories, namely, environmental, clinical and systemic. The environmental category includes on-scene conditions, e.g., weather, time of day, patient entrapment, etc. The clinical category includes medical interventions undertaken such as airway management procedures, establishing intravenous access and administration of medications. The systemic category includes issues relating to ambulance availability, staffing configurations and modes of transport [7].

South Africa and Africa remain resource constrained with regards to EMS systems and structures. As a consequence, local and regional response and on-scene times are often longer than those reported for developed countries with highly evolved EMS systems [4,8]. Despite this, there is little empirical evidence or published literature describing the perceptions of African emergency care providers regarding the factors which they feel may be affecting their on-scene time intervals. The aim of our study was to describe the perceptions of a sample of emergency care providers regarding factors they feel may be affecting their on-scene time intervals. Understanding which factors are most commonly associated with a prolonged on-scene time may assist emergency care providers and EMS managers to identify mitigating strategies.

## Methods

The study was conducted in Johannesburg, South Africa in the pre-hospital Emergency Medical Care environment. A descriptive prospective design was applied making use of a self-designed, non-validated questionnaire consisting of 16 closed and two open-ended questions. The closed questions posed a number of statements to which participant's responses were limited to Agree or Disagree. Participants included operational emergency care providers working in Johannesburg. Convenience sampling was used to identify 36 participants half of whom were employed by a private ambulance service and the other half by a public EMS provider. The sample was also divided equally between the three main levels of qualification, i.e., 12 were Advanced Life Support (ALS), 12 were Intermediate Life Support (ILS) and 12 were Basic

Life Support (BLS) providers. This sampling strategy was employed to equally disperse the responses that were obtained between the different levels of qualification as well as the private and public sector. The study did not aim to compare or correlate responses to the participants' qualifications and/or scopes of practice.

Responses to each of the 18 questions in the questionnaire were captured into Microsoft Excel spreadsheets (Redmond, USA). Basic descriptive statistics were used during the analysis of the closed-ended questions. The two open-ended questions were read through to identify additional views and opinions related to the use of an air ambulance as well as the participants' perceptions of performing complex medical procedures on-scene.

Ethical clearance to conduct this study was granted by the University of Johannesburg's Faculty of Health Sciences Research Ethics Committee. A request to perform the research at the selected companies was sent via email to the managers or the appropriate personnel of the companies. Prior to the completion of the questionnaire, each participant was given an information sheet which briefly described the study as well what would be required if they agreed to participate. Participants were informed of their right to choose not to participate in the study. All participants signed an informed consent letter.

## Results

Thirty-six participants completed the questionnaire. Table 1 shows participant response rates for statements regarding the on-scene time interval.

Participants were asked to indicate the level of effect (No Effect, Limited Effect, or Great Effect) that the selected environmental factors have on prolonging their on-scene times. Responses are summarised in Fig. 1.

Participants were asked to indicate the level of effect (No Effect, Limited Effect or Great Effect) that the selected systemic factors have on prolonging their on-scene times. Responses are summarised in Fig. 2.

Another systemic factor, not mentioned above, is the use of a medical helicopter. A high number of participants (24/35; 69%) agreed that the use of a medical helicopter extends the on-scene time interval unnecessarily.

The participants were asked to state the effect (No Effect, Limited Effect or Great Effect) that the selected clinical factors may have on their on-scene time interval. Responses are summarised in Fig. 3.

BLS and ILS participants were asked whether they believe that waiting on-scene for an ALS paramedic extended the on-scene time interval unnecessarily. Logically, on-scene time intervals will be lengthened while the initial responders (i.e., BLS, ILS) wait for the arrival of ALS. Of the participants who responded, 13/23 (57%) felt that waiting on-scene was unnecessary whilst 10/23 (43%) felt the wait to be justified.

**Table 1**  
Responses to statements regarding the on-scene time interval (n = 36, unless specified).

Statement	Agree n (%)	Disagree n (%)
Spending longer than 20 min on a medical incident is excessive	23 (63.9)	13 (36.1)
Spending longer than 20 min on a trauma incident is excessive	28 (77.8)	8 (22.2)
Extended on-scene time is a factor which negatively affects the patients' outcome, i.e., mortality and morbidity	33 (91.7)	3 (8.3)
As the severity of the patient's condition increases, so does the on-scene time interval at a trauma incident	26 (72.2)	10 (27.8)
As the severity of the patient's condition increases, so does the on-scene time interval at a medical incident	25 (69.4)	11 (30.6)
Emergency care providers often stay on-scene longer than is necessary to stabilise a patient	26 (72.2)	10 (27.8)
The performance of complex medical procedures/interventions such as advance airway management and establishing intravenous access leads to an increase in the on-scene time interval	30 (85.7) <sup>*</sup>	5 (14.3) <sup>*</sup>
The use of a helicopter extends the on-scene time interval longer than necessary	24 (68.6) <sup>*</sup>	11 (31.4) <sup>*</sup>

<sup>\*</sup>35 respondents.

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