

On-scene discharge by Emergency Care Practitioners - a viable option for South Africa?



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ABSTRACT

Background: In South Africa, the national public health sector provides healthcare to the majority of the population, yet many hospitals are in a state of crisis. On-scene discharge or patient non-conveyance to hospital by Emergency Care Practitioners (ECP) may serve as a means for patients to access healthcare services while alleviating the burden on the hospitals. The aim of this study was to determine the number of patients being transported by ambulance to a public sector Emergency Department (ED) who could have potentially been managed and discharged on-scene by a South African pre-hospital ECP.

Methods: This was a prospective, descriptive and quantitative study of patients brought to the ED by ambulance over a 72-hour weekend period. The medical care that was provided in the ED was compared to the existing ECP scope of practice. The patients' disposition was also used as a surrogate to determine whether transportation to hospital was required.

Results: A total of 118 patients were transported to the ED by ambulance, and 85 of these patients consented to participate in the study. Overall, 62.4% of these patients were ultimately discharged from the hospital (60.4% of discharged patients being trauma-related). Most of the treatment modalities prescribed for the discharged patients were within the ECP scope of practice.

Conclusion: Pre-hospital on-scene discharge by ECPs may be a mechanism to alleviate hospital overcrowding in a failing public healthcare system. However, if an ambulance service condones the concept of on-scene discharge, they need to implement monitoring strategies to assess the subsequent outcomes for those patients discharged at the scene.

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BACKGROUND

In South Africa, the national public health sector provides healthcare to the majority of the population,¹ yet many public sector hospitals are in a state of crisis – their infrastructure is often dysfunctional and run down. This includes the referral system from primary healthcare facilities to tertiary hospitals. South Africa also has the compounded

problem of low nurse- and doctor-to-population ratios.^{2,3} This means that many areas of the country not only have limited access to in-hospital medical care, but also that the current hospital system is overwhelmed.²

These system limitations extend into the Emergency Department (ED). Overcrowding, access

and exit block have been linked to a range of adverse outcomes for both patients and staff.⁴ The excess patient mortality and morbidity occur irrespective of whether the patients are admitted or discharged.⁴ Various ways of alleviating these problems are continually being sought.

A reduction in the number of patients arriving to the ED by ambulance has been suggested as a possible solution to ease the overloaded system. Patients can be assessed on-scene and a decision can be made whether transport to hospital is truly required;⁵ paramedics and emergency physicians agree that a significant percentage of patients do not, in fact, require ambulance transportation to the hospital.⁶

On-scene discharge or patient non-conveyance by Emergency Care Practitioners (ECP) in South Africa may serve to fulfil the criteria set out by the Patient's Rights' Charter for patients "to utilise the health care system properly" while still being able to "access health care services".⁷ That said, patient safety is paramount when considering emergency medical service systems for on-scene discharge. Prior studies looking into utilising paramedics and nurses to perform on-scene discharge have reported differing levels of success.⁸⁻¹⁰ Moreover, concerns around patient safety are reflected in the Health Professions Council of South Africa's Clinical Practice Guidelines for emergency care providers wherein it is indicated that, "stringent continuous quality improvement measures must be in place if a[n Emergency Medical] service implements on-scene discharge practices".¹¹

A professional bachelor's degree, such as that completed by an ECP, demands high intellectual independence and development of research capacity in the methodology and techniques of that discipline.¹² South African ECPs are registered as independent pre-hospital practitioners with the Health Professions Council of South Africa. To register and practice as an ECP, one must have completed a four-year full-time professional bachelor's degree in emergency medical care through a university or completed a National Diploma followed by a Bachelor of Technology degree.¹³ A major component of the bachelor's degree programmes focuses on patient assessment, diagnostics and clinical decision-making. Such skills and abilities arguably place the ECP in a position to conduct on-scene discharge and make direct referrals within the healthcare system. However, in many regions, the scope of practice and systems required to support on-scene discharge may not be well-defined or developed. Consequently, current practices are such that the majority of patients are transported to the ED of receiving facilities, regardless of the

nature of their complaint or their level of acuity.¹⁴

The aim of this study was to determine the number of patients being transported by ambulance to a public sector ED who could have been potentially managed and discharged on-scene by a South African pre-hospital ECP.

DESIGN AND METHODS

This was a prospective, descriptive and quantitative study which took place at a tertiary academic public hospital in a metropolitan area of Johannesburg, South Africa. The hospital serves a population of approximately 1 million people and sees 65 000 patients annually.¹⁵

Ethical approval for this study was obtained from the University of Johannesburg's Faculty of Health Sciences, Research Ethics Committee [REC-01-99-2016] as well as the head of the ED and Chief Executive Officer of the hospital. Informed consent was obtained from all enrolled patients.

Data were collected over a period of 72 hours – Friday, 21 October 2016 until Monday, 24 October 2016. The selection of this time interval was purposeful in that it would include the weekend timeframe when the outpatient departments are closed. The following data were gathered:

1. The total number of cases brought to the ED by ambulance.
2. The total number of patients arriving by ambulance who were discharged from the ED; i.e. how many were sent home after assessment and/or treatment by the doctor.
3. The medical care that was provided in the ED to patients brought by ambulance; i.e. medical interventions, investigations and related care.
4. The above data were compared to the 2018 ECP scope of practice.¹¹

Data Analysis

The raw data were captured on an Excel® spreadsheet for collation. The data were then analysed using simple descriptive statistics.

RESULTS

There were 450 patients seen in the ED during the specified 72-hour study period. A total of 118 patients were transported to the ED by ambulance. Consent was obtained from 85 of those patients to participate in the study. The patients' demographics are presented in Table 1 (sex and age were not collected).

Table 1: Patient Demographics

Triage Category*	Admitted n (%)	Discharged n (%)	Total
Red	0 (0)	1 (100)	1 (1.2)
Orange	16 (66.7)	8 (33.3)	24 (28.2)
Yellow	14 (36.8)	24 (63.2)	38 (44.7)
Green	2 (9.1)	20 (90.9)	22 (25.9)
Type of Pathology	Admitted n (%)	Discharged n (%)	Total
Trauma	10 (31.3)	32 (60.4)	42 (49.4)
Non-trauma	22 (68.8)	21 (39.6)	43 (50.6)
Total	32/85 (37.6)	53/85 (62.4)	

*Triage category was according to the South African Triage Scale: Red - resuscitation; Orange - those to be seen within 10 minutes of ED arrival; Yellow - those to be seen within 1 hour of ED arrival; and Green - non-urgent.

Special Investigations Performed in Hospital on Medical and Trauma Patients

The most frequently undertaken special investigations for both the trauma and medical (non-

trauma) patients are shown in Figure 1. Thirty-three (62.3%) of the discharged patients received at least one special investigation.

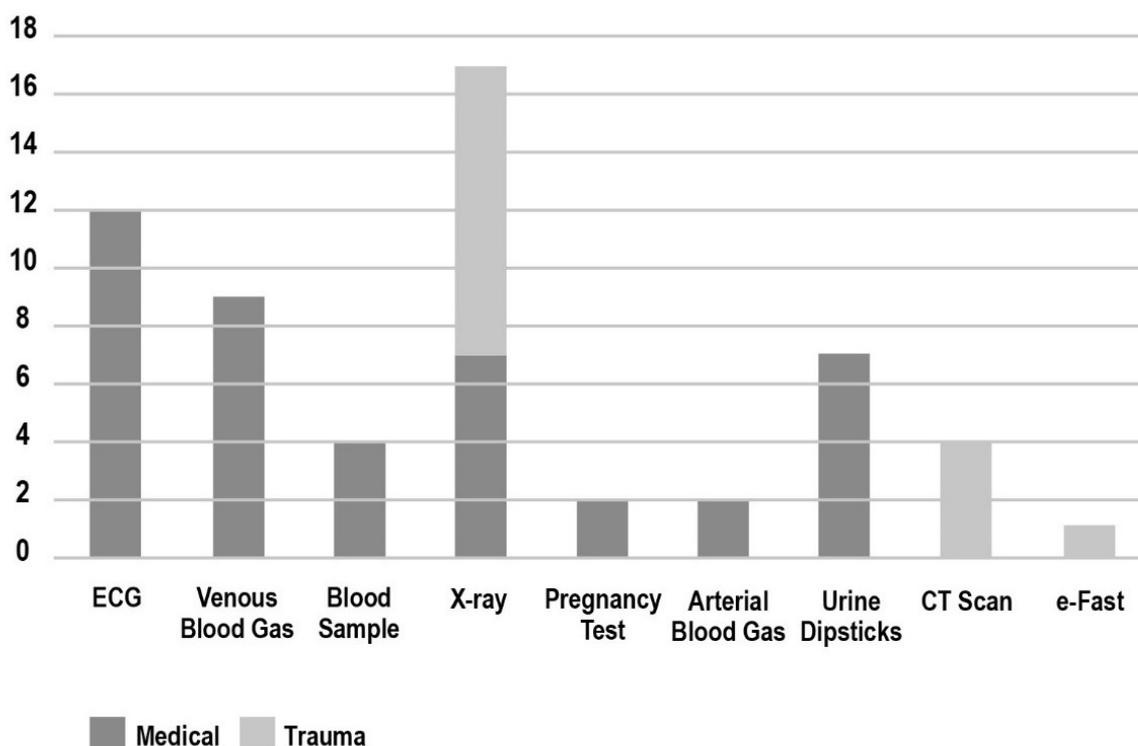


Figure 1: Hospital Special Investigations Conducted in Trauma and Medical Patients

CT=scan computed tomography scan, ECG=electrocardiogram, e-FAST=extended focused assessment with sonar in trauma.

Presenting Symptom Systems and Mechanism of Injury of Discharged Patients

The presenting symptom systems of the medical patients and mechanisms of injury for the trauma patients who were discharged from the ED are presented in Table 2.

Hospital Treatment Provided for Discharged Patients Compared to ECP Scope of Practice

Table 3 tabulates the treatments administered in the ED compared with the ECP scope of practice.

Table 2: Presenting Symptom Systems and Trauma Mechanisms of Injury: Discharged Patients

<i>Medical Presenting Symptom Systems</i>	n (%)
Gastrointestinal	8 (36.4)
Neurological	4 (18.2)
Gynaecological	2 (9.1)
Dermatological	2 (9.1)
Respiratory	1 (4.5)
Cardiovascular	1 (4.5)
Metabolic	1 (4.5)
Urological	1 (4.5)
Endocrine	1 (4.5)
Musculoskeletal	1 (4.5)
<i>Mechanism of Injury</i>	n (%)
Motor Vehicle Accident	14 (46.7)
Common Assault	11 (36.6)
Penetrating Trauma	3 (10.0)
Pedestrian Vehicle Accident	1 (3.3)
Other Causes	1 (3.3)

Table 3: Hospital Treatment Provided for Discharged Patients vs ECP Scope of Practice

<i>Hospital Treatment</i>	n (%)	ECP Scope
Analgesia	24 (46.2)	Yes
Intravenous Therapy	23 (44.2)	Yes
Suturing	10 (19.2)	Yes
Wound Dressing	1 (1.9)	Yes
Crutches ^a	1 (1.9)	Yes
Thiamine	1 (1.9)	Yes
Aspirin	1 (1.9)	Yes
Anti-tetanus Toxoid	5 (9.6)	No
Intravenous Antacid	4 (7.7)	No
Intravenous anti-epileptics (e.g. Valproic acid)	2 (3.8)	No
Topical Steroids	1 (1.9)	No

Total number of patients = 53 (some patients received more than one treatment modality), a = although crutches are not specifically referred to in the ECP list of capabilities, they could potentially be dispensed by the "reasonable ECP", hence we included it as a potential intervention that could be performed.

DISCUSSION

An overburdened and dysfunctional public health system needs all the help it can get when it comes to alleviating the pressure on the system itself. Decreasing the number of unnecessary ambulance cases presenting to the hospital is one such potential intervention.

Mechanisms to Determine the Appropriateness of On-scene Discharge

The determination of which patients should and should not be transported to the ED is a perpetual dilemma in the pre-hospital setting.⁹ Paramedics' ability to determine which patients can safely be treated in the community is, unfortunately, commonly inaccurate.^{4,8,9} This can lead to increased patient morbidity and mortality.

Potential confounders with regards to the determination of appropriateness for on-scene discharge, however, may stem from the comparator. Different outcomes in terms of the appropriateness of the paramedic decision will depend on whether the decision was compared to the patient's actual disposition from the ED (i.e. discharge and admission, as well as the occurrence of subsequent events such as ambulance re-request), whether the patient presented for a second ED visit, admission and/or death.¹⁶ All prior studies point to the dangers of paramedic under-triage, resulting in patients being left in the community rather than being brought to hospital.^{5,6,8,9,16}

Triage as a Mechanism to Determine the Appropriateness of On-scene Discharge

The South African Triage Scale is an in-hospital ED triage system. Patients who are triaged green are so-called 'non-urgent' patients, and they can be seen at a primary healthcare clinic.¹⁷ These patients may also potentially be discharged on-scene by an ECP due to their low acuity. Almost one-quarter of patients who were brought to the hospital could therefore potentially not have been conveyed to the hospital. This is reinforced by the fact that over 90% of these patients were subsequently discharged home. The South African Triage Scale could be applied to the patient in the pre-hospital setting along with the ECP's clinical judgement and scope of practice in order to decrease patient conveyance to hospital. In our study, the ED nurses performed the triage. There could potentially have been more patients triaged green and therefore amenable to on-scene discharge – this group of patients is commonly over-triaged.¹⁷

Type of Pathology as a Mechanism to Determine the Appropriateness of On-scene Discharge

The majority (70%) of patients presenting to this ED are usually non-traumatic in aetiology. As our data collection specifically took place over a week-end, it was unsurprising that there was a higher rate of trauma presentations. Trauma patients had fewer special investigations performed and were more likely to get discharged from the ED. This is similar to other studies where trauma patients had the lowest probability of hospital admission.^{8,9} The trauma group of patients also had fewer in-hospital procedures performed, making their on-scene discharge a potential option. There were also more possible procedures that could be performed by ECP on the trauma patients. The provision of anti-tetanus toxoid into the ECP scope of practice would also make this more feasible.

Presenting Symptoms and Mechanism of Injury to Determine the Appropriateness of On-scene Discharge

The small sub-group of discharged medical patients' presenting symptoms and trauma patients' mechanisms of injury make meaningful suggestions for on-scene discharge impossible based on this data.

Consequences of On-scene Discharge

Delays in the initiation of treatment secondary to an incorrect on-scene discharge decision may lead to dire consequences for patients. The risks of the patient's condition deteriorating need to be

weighed up against the potential burden of an unnecessary ambulance conveyance to hospital.^{6,9} Despite the current ECP clinical practice guidelines stating that continuous quality improvement measures should be in place in order to implement on-scene discharge, there are currently no published data on the discharge practices of the feasibility thereof in Emergency Medical Services in South Africa.¹¹

If an ambulance service condones the concept of on-scene discharge, they need to implement monitoring strategies to assess the subsequent outcomes for those patients discharged at the scene. The outcomes of interest include ambulance re-request, ED presentation (via alternate transportation), hospital admission, and death within 24 hours of the initial callout.¹⁶

LIMITATIONS

This was not a prospective study that followed the patients from the scene to the hospital. The patients' pre-hospital condition was not utilised as a means of determining suitability for hospital non-conveyance. Nurses' application of the South African Triage Scale is prone to errors,¹⁷ and utilisation of the score as a means of confirming on-scene discharge may therefore have been underestimated. Other limitations include the use of discharge from the ED as a comparator to different practices regarding decision-making in the non-transportation of patients in other countries. No patients were followed-up with to assess changes that may have impacted their discharge decision. Patient demographics were also not collected, and previous studies have shown that older patients are more likely to be under-triaged by paramedics and sustain more harm from pre-hospital discharge than younger patients.^{8,16}

CONCLUSION

Pre-hospital on-scene discharge by ECPs may be a mechanism to alleviate hospital overcrowding in a failing public healthcare system. Methods to perform this safely and effectively need to be in place prior to implementation in order to prevent deleterious effects from miss-assessed patients. Comparing the potential on-scene discharge patient with the patient admitted or discharged from the ED, however, may not ideally determine the appropriateness thereof.

CONFLICTS OF INTEREST

The authors report no conflicts of interest.

AUTHOR CONTRIBUTIONS

CV-L conceptualised the study. SS collected the data. All authors were involved in data analysis and interpretation of data. LG drafted the initial version of the manuscript. All authors revised, edited and substantially contributed to the critical revision of the manuscript. Final approval of the version to be published is made by all authors who agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. LG takes responsibility for the paper as a whole.

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