

Technology for trauma: testing the validity of a smartphone app for pre-hospital clinicians



Eleanor S. Freshwater BA (Hons) PGCert^{a,b,*}, Robert Crouch RN, PhD, FRCN^{a,b}

^a Emergency Department, University Hospital Southampton, Tremona Road, Southampton, Hampshire, UK, SO16 6YD

^b Faculty of Health Sciences, University of Southampton, 104 Burgess Road, Southampton, SO17 1BJ

ARTICLE INFO

Article history:

Received 4 February 2014

Received in revised form 17 April 2014

Accepted 22 April 2014

Keywords:

Pre-hospital emergency care

Emergency medical services

Paramedics

Emergency medicine

Trauma

ABSTRACT

Introduction: With the introduction of regional trauma networks in England, ambulance clinicians have been required to make triage decisions relating to severity of injury, and appropriate destination for the patient, which may require ‘bypassing’ the nearest Emergency Department. A ‘Trauma Unit Bypass Tool’ is utilised in this process. The Major Trauma Triage tool smartphone application (App) is a digital representation of a tool, available for clinicians to use on their smartphone. Prior to disseminating the application, validity and performance against the existing paper-based tool was explored.

Methods: A case-based study using clinical scenarios was conducted. Scenarios, with appropriate triage decisions, were agreed by an expert panel. Ambulance clinicians were assigned to either the paper-based tool or smartphone app group and asked to make a triage decision using the available information. The positive predictive value (PPV) of each tool was calculated.

Results: The PPV of the paper tool was 0.76 and 0.86 for the smartphone app. User comments were mainly positive for both tools with no negative comments relating to the smartphone app.

Conclusion: The smartphone app version of the Trauma Unit Bypass Tool performs at least as well as the paper version and can be utilised safely by pre-hospital clinicians in supporting triage decisions relating to potential major trauma.

© 2014 Elsevier Ltd. All rights reserved.

1. Background

Major Trauma Networks began in London and went live across England in April 2012 which require patients with major trauma to be transported to dedicated major trauma centres (Department of Health, 2012). Trauma networks were developed in response to numerous reports that identified sub-optimal care and the need to improve survival from major trauma (Findlay et al., 2007; Fisher et al., 2010). The current system utilises a ‘hub and spoke’ model with Major Trauma Centres (MTCs) supported by Trauma Units (TUs) and Local Emergency Hospitals (LEHs). MTCs are able to offer enhanced care with input from multiple specialties for the most seriously injured patients. Internationally, similar networks have shown improved outcomes (Cameron et al., 2008; Celso et al., 2006; Lansink and Leenen, 2007; MacKenzie et al., 2006; Sampalis et al., 1999). Early work from England reports that 20% more patients are now surviving since the introduction of Major Trauma Networks (NHS England, 2013).

In order to ensure that the most seriously injured patients are treated at an MTC, accurate identification of those suffering from major trauma in the pre-hospital phase is essential. Patients that

do not require specialist care should be transported to the closest appropriate hospital, avoiding overloading of MTCs and the subsequent use of resources. Accurate pre-hospital triage is vital to the success of Major Trauma Networks.

Major Trauma Triage criteria and decision support tools have been used in the USA since the 1990s (Henry et al., 1996; Newgard et al., 2011; Purtil et al., 2008) to assist Emergency Medical Services (EMS) decision-making. Similar tools have been developed in the UK by expert panels; many have not been formally evaluated to ascertain their validity and reliability.

Pre-hospital clinicians in the Wessex region are provided with the Trauma Unit Bypass (TUB) tool, a decision tree, combining anatomical injuries and physiological signs to guide hospital destination selection (Fig. 1). It is presented as an algorithm in pocket-sized and A4 printed form. Clinical staff received education about trauma networks and use of the TUB tool prior to launch.

1.1. Development of the smartphone application

Working in practice it became clear that some EMS providers were storing a version of the tool on smartphones and tablets to use in the field. In addition, it was recognised that many clinicians access other decision-support tools and information in the form of smartphone applications, such as the British National Formulary (BNF) and NICE guidelines in clinical practice. Observing this practice led

* Corresponding author. Tel.: +07816 880465.

E-mail address: els.freshwater@uhs.nhs.uk



Trauma Unit Bypass Tool

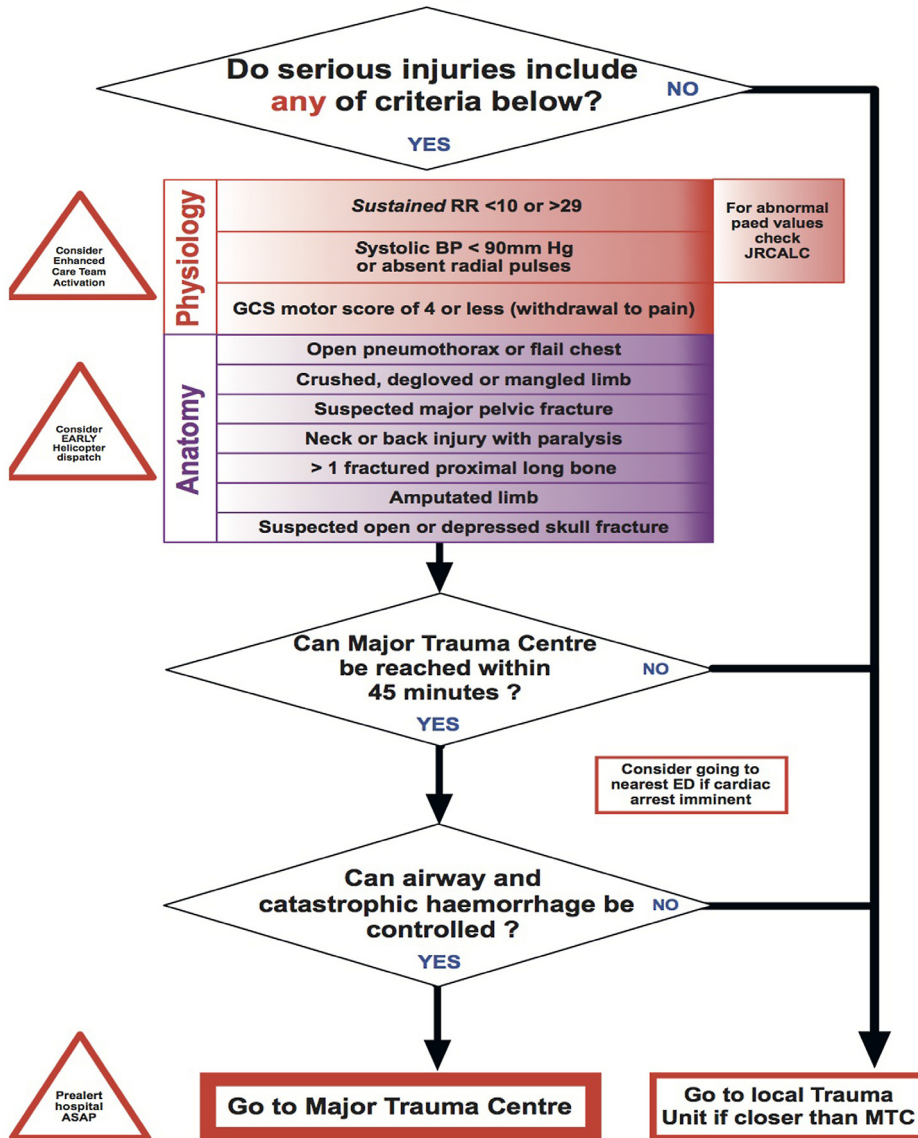


Fig. 1. Wessex Trauma Unit Bypass Tool.

to discussions about development of a digital representation of the Wessex Trauma Network (WTN) TUB tool. A software development company (Volatile State Ltd) were approached and agreed to develop the application initially on the Apple® iOS iPhone® platform.

The application, named the Major Trauma Triage Tool, consists of three elements: the TUB tool, recommendations for hospital destination, based on location, and collection and presentation of clinical handover information in an ATMIST format (SWASFT, 2013). Given the change in format of the tool, from a paper-based algorithm to an interactive digital representation in the form of an app, it was necessary to compare the utilisation of the formats in clinical decision-making and triage.

1.2. Aim

To compare ambulance staff decision outcomes using the TUB paper-based version with the smartphone app.

2. Methods

2.1. Design

A clinical scenario-based testing of triage decision-making of pre-hospital clinicians using either the paper-based TUB tool or smartphone app.

Download English Version:

<https://daneshyari.com/en/article/2609483>

Download Persian Version:

<https://daneshyari.com/article/2609483>

[Daneshyari.com](https://daneshyari.com)