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Assessing clinical handover between paramedics and the trauma team

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ABSTRACT

Introduction: The aim of effective clinical handover is seamless transfer of information between care providers. Handover between paramedics and the trauma team provides challenges in ensuring that information loss does not occur. Handover is often time-pressured and paramedics' clinical notes are often delayed in reaching the trauma team. Documentation by trauma team members must be accurate. This study evaluated information loss and discordance as patients were transferred from the scene of an incident to the Trauma Centre.

Methods: Twenty-five trauma patients presenting by ambulance to a tertiary Emergency and Trauma Centre were randomly selected. Audiotaped (pre-hospital) and videotaped (in-hospital) handover was compared with written documentation.

Results: In the pre-hospital setting 171/228 (75%) of data items handed over by paramedics to the trauma team were documented and in the in-hospital handover 335/498 (67%) of information was documented. Information least likely to be documented by trauma team members (1) in the pre-hospital setting related to treatment provided and (2) in the in-hospital setting related to signs and symptoms. While 79% of information was subsequently documented by paramedics, 9% ($n = 59$) of information was not documented either by trauma team members or paramedics and constitutes information loss. Information handed over was not congruent with documentation on seven occasions. Discrepancies included a patient's allergy status and sites of injury ($n = 2$). Demographic details were most likely to be documented but not handed over by paramedics.

Conclusion: By documenting where deficits in handover occur we can identify points of vulnerability and strategies to capture this information.

Introduction

The delivery of high quality care necessitates that there is effective communication between providers. At each juncture of care, whether it is at shift changeover or when patients move across care boundaries, opportunities exist for communication errors to occur and for information to be lost. Communication errors are costly, both in human[5] and economic cost.[2,5,10] The interface between paramedics and the trauma team provides a particularly vulnerable period for communication errors to occur. There is often little time to document extensive information about the patient's condition in transit to hospital, resulting in substantial dependence on memory by paramedics when providing a verbal handover. Written documentation from paramedics is often not made available to the trauma team for some time after the patients' arrival. The complex nature of trauma events[1] and the time critical nature of transmitting information to multiple people with many interruptions, coupled with the need for receiving trauma teams to rely on memory when paper documentation is not present increases risk that information will be lost or misinterpreted.[6,12] A study undertaken to identify whether information was retained following verbal handover in the trauma setting found that only 34% of information verbalised by paramedics was recalled by receiving physicians for patients who had suffered severe trauma.[12] To our knowledge no study has published quantification of information loss, constituting information handed over but not documented, and information discordance between paramedics and the receiving trauma team.

The aim of this study was therefore to identify (1) whether information handed over by paramedics prior to and on arrival in the Trauma Centre was accurately documented by trauma team members; and (2) whether information was documented by paramedics but not handed over to trauma team members. If information was not recorded or inaccurately documented, we

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aimed to describe where this was most likely to occur. Ethics approval for this study was provided by relevant Institutional Ethics Committees.

Methods

Study setting and population

This study took place between August 2007 and July 2008 at the Alfred Hospital a 350 bed tertiary teaching hospital in Melbourne, Australia. The Level 1 Emergency and Trauma Centre treats approximately 47,000 emergency patients annually. In 2005–2006 it received 806 major trauma cases (ISS > 15) representing 55% of all major trauma cases in Victoria.[16]

Patient selection

Patients included in this study must have suffered a major injury and been bought into the hospital by either road or air ambulance. As this was largely explorative, it was decided a priori that a sample of 25 patient encounters would be reviewed. Block randomisation was used to ensure capture of patients across the three shift changes using a database established as part of a concurrent study being undertaken in the Emergency and Trauma Centre, in which all major trauma cases were routinely videotaped.[4] Ethical approval for the study was provided by the Institutional Ethics Committee of the hospital and ambulance service.

Data collection

Verbal information handed over and accompanying written documentation in the out-of-hospital and in-hospital environment was assessed and compared. The stages of information transfer between the paramedics and the receiving hospital are outlined in Fig. 1. The pre-hospital verbal handover was provided to the receiving hospital by either the paramedic treating the patient or a paramedic in the Ambulance Control Centre. This telephone handover was routinely audiotaped by Ambulance Victoria. The pre-hospital handover was received by the doctor or nurse in charge of the Emergency and Trauma Centre and information was routinely documented on the Trauma Notification Sheet. The Trauma Notification Sheet was archived in the Emergency and Trauma Centre for audit purposes.

The in-hospital handover was provided verbally by paramedics and documented by the scribe nurse in the trauma bay on the Observation Chart. This handover was captured by closed circuit video cameras placed in the trauma bays. Paramedics then completed a record of the event on their electronic Patient Care Record (PCR) housed on table computers carried paramedics. While a delay of up to 30 min might exist before the PCR was completed, printed out and inserted into the patient's in-hospital medical record, this usually occurred prior to the patient's discharge from the Emergency and Trauma Centre.

Audiotapes of the pre-hospital verbal handover were retrieved and transcribed. Video footage from the trauma bays, the Trauma Notification Chart, observation chart and the paramedics PCR were retrieved for each of the 25 cases.

Two researchers independently recorded each discrete data item verbally handed over by reviewing audiotaped transcripts and videotaped handovers. Data items were documented according to five categories: demographic information, mechanism of injury, injuries sustained, signs and symptoms and treatment provided (known as DeMIST). This format has been developed to provide structure to the process of patient handover[3] and is commonly used as a training guide by paramedics.[9] Information handed over which related to the patient's past medical history including previous injuries, medication taken and allergy status was included in the demographic detail section of DeMIST. Where discrepancies were identified, source data were retrieved and assessed by the researchers, and consensus was reached.

Data analysis

Information loss and discordance were assessed in the pre-hospital and in-hospital environment by comparing information transmitted verbally (via initial phone handover and at face-to-face handover) with written documentation (trauma notification sheet, observation charts and ambulance PCR). Information loss occurred when a data item was not documented. To assess differences between data items handed over and documented in each setting, and between data items handed over in the pre-hospital and

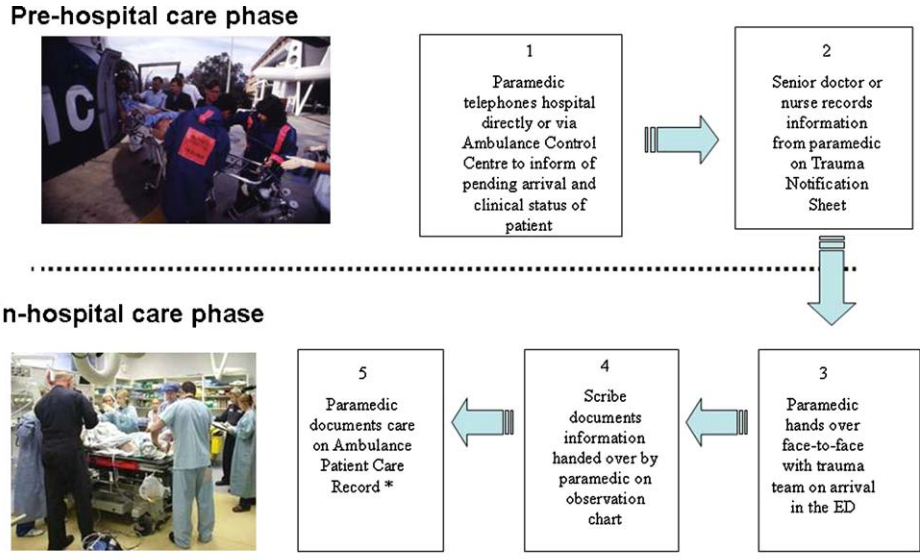

Fig. 1. The stages of information transfer between paramedics and the receiving hospital.