



Featured Article

# Joint Training Simulation Exercises: Missed Elements in Prehospital Patient Handoffs

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## KEYWORDS

simulation;  
patient handoff;  
pre-hospital;  
transfer of care;  
interprofessional;  
critical care transport

## Abstract

**Background:** Communication handoffs between fire rescue, medical transport, and hospital-based teams are not standardized, potentially leading to miscommunication, medical errors, and adverse patient outcomes. There is evidence from other acute care settings that structured handoffs improve communication and reduce adverse patient outcomes.

**Method:** Researchers analyzed ten video-recorded joint training simulation exercises between prehospital rescue and air medical transport crews to identify gaps in the communication and handoff process.

**Results:** Eight of the 30 essential items were missed more than 50% of the time. The most commonly missed elements included: the air medical team thanking fire rescue for their help (100%), capturing the time the incident occurred (90%), and the air medical crew identifying a team leader during the patient handoff.

**Conclusion:** High-fidelity joint training simulations provided an as-real-as possible environment to assess patient handoffs between fire rescue and air medical transport crews in unstructured environments.

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## Background

The use of medical transport has increased substantially and will continue to grow as health care costs drive community hospitals to consolidate costly services coupled with advanced technological interventions available only at

large academic medical centers. Effective medical transport requires the practitioner to have situational awareness and manage the dynamic needs of the patient in unstructured, uncertain, and often unforgiving environments (Alfes, Steiner, & Manacci, 2015). Medical transport teams should be trained in effective communication and handoffs as they provide the critical link between health care settings as patients are moved across the various care settings.

The World Health Organization has identified communication during patient handovers as a priority patient safety concern. Handoffs, the transfer of information from

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one provider to another, are identified as significant sources of medical errors (Cohen, Hilligoss, & Kajdacsy-Balla Amaral, 2012). To be effective, there are recommendations that handoffs are structured versus anecdotal (Arora, Johnson, Meltzer, & Humphrey, 2008; Arora et al., 2009),

yet most handoff processes are not structured. Failure to communicate effectively during the handoff process in medical transport can result in poor coordination, increased errors, and adverse events (Dalto, Weir, & Thomas, 2013; Horwitz, Moin, Krumholz, Wang, & Bradley, 2008). Tools have been developed in hospital settings (Payne, Stein, Leong, & Dressler, 2012) and civilian transport teams (Dojmi Di Delupis et al., 2014; Weingart et al., 2013) to improve communication, but no universal structured handoff tool exists to support transport teams across the many different practice environments encountered during military and/or civilian transport across the globe.

Researchers felt analyzing patient handoffs during joint training simulation exercises between prehospital rescue and air medical transport crews would facilitate the identification of gaps in communication and uncover a core

set of information needed for a successful handoff, regardless of clinical situation or setting. The purpose of this pilot study was to develop, conduct, and establish the feasibility of conducting joint training simulation exercises between fire rescue and medical transport teams to analyze patient handoffs.

## Methods

### Sample

The sample for this study consisted of three rural fire departments and one critical care transport team. The fire departments were situated in Northeast Ohio and are

responsible for primary 911 fire and rescue response and consisted of a mixture of emergency medical technicians and paramedics. The critical care transport team transfers approximately 5,300 patients annually—70% by ambulance, 27% helicopter, and 3% via jet, and consisted of a mixture of nurse practitioners, nurses, and paramedics. No power analysis was completed for this pilot study due to the fact that this was a pilot study investigating feasibility of conducting the joint training simulation exercises.

### Simulation Scenarios

The simulation-training exercises were developed by the critical care transport team instructors and fire rescue staff instructors to be conducted in situ using standardized patients. Four clinical scenarios were developed that included: (a) trauma/drowning victim at a lake, (b) an adult burn patient, (c) a pediatric fall/trauma patient, and (d) a motor vehicle crash with multiple patients. Each scenario was set up by the clinical instructors in an outdoor setting. For example, the motor vehicle crash consisted of an actual crashed car on the side of a road that the standardized patient, moulaged to reflect appropriate injuries, was placed in. No briefing was given to the participants before starting the scenario. Each scenario started with arrival of the fire rescue crew to the patient who began administering care. Participants were able to converse with the standardized patient and when further information was required, an instructor would provide cues from the standardized scenario information sheet. While fire rescue was extricating the patient, the air medical transport team was flying from their base of operations to land at the rural scene of the crash. Once extricated, the patient was transitioned into a nearby waiting ambulance. When the air medical transport team arrived, usually 10-20 minutes into the simulation, they would enter the ambulance and assume care of the patient from the fire rescue team, load the patient onto the transport stretcher, and then transfer the patient into the helicopter. Once inside the helicopter, the air medical transport team would continue to treat the patient for approximately five minutes, after which time they were asked to provide a brief radio patient report to the receiving trauma center. On completion of the radio report, the simulation was terminated. The handoff of care between the fire rescue team and the air medical team was the primary focus of the training exercise. Each simulation-training exercise was video recorded. Approval for this study was granted by the university's institutional review board.

### Video Grading Rubric and Analysis

An extensive literature search of handoff procedures and patient transfers was conducted using CINAHL and PubMed producing 1,042 potential articles between 2008

#### Key Points

- Medical transport teams must be trained in effective communication and handoffs as they provide the critical link between healthcare settings as patients are moved across various care settings.
- This pilot study identified that 8 of the 30 items considered essential for supporting effective patient handoffs are missed routinely.
- Developing an essential set of core information that must be communicated during every handoff, regardless of clinical situation or setting, will facilitate simulation platforms for joint training exercises to improve communication skills and effective patient handoffs.

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