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Education

RESIDENT TO RESIDENT HANDOFFS IN THE EMERGENCY DEPARTMENT: AN OBSERVATIONAL STUDY

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□ **Abstract—Background: Despite patient handoffs being well recognized as a potentially dangerous time in the care of patients in the emergency department (ED), there is no established standard and little supporting research on how to optimize the process. Minimizing handoff risks is particularly important at teaching hospitals, where residents often provide the majority of patient handoffs. Objective: Our aim was to identify hazards to patient safety and barriers to efficiency related to resident handoffs in the ED. Methods: An observational study was completed using the Systems Engineering Initiative for Patient Safety model to assess the safety and efficiency of resident handoffs. Thirty resident handoffs were observed with residents in emergency medicine over 16 weeks. Results: Residents were interrupted, on average, every 8.5 min. The most common deficit in relaying the plan of care strategy was failing to relay medications administered (32%). In addition, there were ambiguities related to medication administration, such as when the medication was next due or why a medication was chosen, in 56% of handoffs observed. Ninety percent of residents observed took handwritten notes. A small percentage (11%) also completed free texted computer progress notes. Ten percent of residents took no notes. Conclusions: The existing system allows for a clear summary of the patient's visit. Two major deficits—frequent interruptions and inconsistent communication regarding medications administered—were noted. There is inconsistency in how information is recorded at the time of handoff. Future studies should focus on handoff improvement and error reduction.** © **2014 Elsevier Inc.**

□ **Keywords—hand offs; resident; patient safety; observational study; transitions of care**

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INTRODUCTION

"Transitions of care" or "handoffs" are defined as the transition of responsibility for a patient and communication of patient-specific information, data, and care plans between health care providers (1). Communication errors during transitions of care were found to be a major source of adverse events, prompting the Joint Commission to prioritize this as a safety goal in 2006 (2).

In the emergency department (ED), up to 24% of malpractice cases are directly attributed to communication errors at the time of patient handoff (3). Despite patient handoffs being well recognized as a critical time in the care of patients, there are no established standards and there is little supporting research on how to optimize handoffs in the ED (4–6). The 2010 *Annals of Emergency Medicine* article "Improving Handoffs in the Emergency Department" is a highly comprehensive review of handoffs in emergency medicine (EM). However, there remains a need for specific actionable recommendations on which to develop an ideal handoff system (6). The

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literature offers only a few published studies examining some of the recommended strategies as well as numerous pneumonics that can be used. Unfortunately, there is little agreement on which is most effective (7). A 2007 cross-sectional survey of EM training program directors found that 50% of physician staff handoffs were "verbal only" and 72% agreed that a standardized handoff system would improve communication and reduce medical error (8).

Minimizing risks to patient safety at the time of handoffs is particularly important at teaching hospitals, where residents in training often provide a majority of the care to the patient. In 2007, a review of five insurance companies' closed claims from a 22-year period of clinical practice found 889 claims to have both error and injury from that error. Two-hundred and forty of these medical adverse events involved trainees. Seventy percent of errors involving trainees were teamwork related and 20% were specifically due to handoffs (9). In addition, the newly released 2013 Accreditation Council for Graduate Medical Education requirements for EM require that residency programs ensure that residents are "competent in communicating with team members during handoffs," while both programs and their sponsoring institutions "must ensure and monitor effective, structured handover processes to facilitate both continuity of care and patient safety" (10).

While there is a growing body of literature from inpatient medicine and nursing suggesting that a combination of written and verbal communication is optimal, there remains a paucity of objective data regarding safety hazards, efficiency barriers, and best practices related to handoffs in the ED (11). This study uses observational methods to assess the safety and methods of resident to resident handoffs in our ED, to identify key barriers to handoffs of care, and to identify potential solutions to improve the safety of transitions of care.

METHODS

The study was conducted in the ED of a Level I trauma center and academic teaching hospital with an annual volume of approximately 62,000 patients per year. The ED uses an electronic patient record for documentation of the patient visit and no handoff tool existed at the time of the study. All trainees in the 4-year EM training program were eligible for inclusion and both day and night shifts were sampled. Off-service residents who rotate through the department and physician assistants were excluded from this study. In this study, we define a handoff as "a transfer of responsibility for assessment, treatment, and disposition from one EM resident to another." No patient identification or health information was recorded in this study. The Institutional Review Board approved this study and all participants consented to involvement.

A convenience sample of observations were completed using the Systems Engineering Initiative for Patient Safety (SEIPS) model, a well-established human factors engineering framework to study health care systems, to assess the safety of resident handoffs (12). Seven areas were observed and recorded, including process steps, people involved, tools/technologies, organizational issues, physical environment, tasks, and ambiguities (13). Observations were completed by a single ED physician with basic training in human factors engineering. Training involved a workshop in human factors engineering and several one on one meetings with the developer of the SEIPS model. Data were transcribed at the time of the observation. Initial observations were reviewed by a human factors engineer to ensure consistency and relevance of observational data recorded. Analysis was progressively done as observations were completed. Observations were terminated when theoretical saturation point was met and clear patterns were established (14).

In addition to the semi-structured observation tool from the SEIPS model, all observations were timed using a stopwatch. This was used to calculate the mean number of minutes per patient handed off and the frequency of interruptions. Additional information recorded for each observed handoff included the number of patients handed off. For each patient that was discussed, the observer recorded if the following was reviewed: history of present illness, laboratories, radiology findings, medications and intravenous fluids given, pending data, and disposition.

RESULTS

Thirty observations were completed during a 3-month period in the winter of 2012 to 2013. Twenty-five residents were consented and observed completing at least one handoff during this time period. Sixteen percent were first-year residents, 20% were second-year residents, 32% were third-year residents, and 32% were fourth-year residents. Fifty-six percent of observations were completed during the day (between 7 AM and 3 PM) and 44% were completed in the evening (between 3 PM and 11 PM). A mean of 3.3 min (standard deviation [SD] 2.19 min, median 3.0 min) was spent handing off each patient. The number of patients handed off ranged from 3 to 19, with a mean of 10 patients being handed off. The number of patients in the department at the time of handoff ranged between 39 and 110.

Table 1 shows a summary of the observational data collected.

Process

The residents followed a relatively consistent process, with 93% of residents reviewing charts before the start

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