Handoff Communication Between Outpatient Clinics and the Emergency Department: A Needs Assessment for Developing Standard Tools and Training

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This Thesis, "Handoff Communication between Outpatient Clinics and the Emergency Department: A Needs Assessment for Developing Standard Tools and Training", presented by Kathleen Huth, and Submitted to the Faculty of The Harvard Medical School in Partial Fulfillment of the Requirements for the Master of Medical Sciences in Medical Education has been read and approved by:

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Date: April 14, 2017
HANDOFF COMMUNICATION BETWEEN OUTPATIENT CLINICS AND THE EMERGENCY DEPARTMENT: A NEEDS ASSESSMENT FOR DEVELOPING STANDARD TOOLS AND TRAINING

KATHLEEN HUTH

A Thesis Submitted to the Faculty of

The Harvard Medical School

in Partial Fulfillment of the Requirements

for the Degree of Master of Medical Sciences in Medical Education

Harvard University

Boston, Massachusetts.

May, 2017
Acknowledgements

We thank the I-PASS Executive Council for their expert guidance in the design and implementation of this study. We wish to acknowledge the Program for Patient Safety and Quality Grants Program at Boston Children’s Hospital for financial and statistical support. We are also grateful for the thoughtful input from the thesis committee; Dr. Theodore C. Sectish, Dr. Glenn Rosenbluth, and Dr. Kathleen N. Conroy. Thank you also to the program leadership of the Master of Medical Sciences in Medical Education for supporting this study.

This work was conducted with support from Students in the Master of Medical Sciences in Medical Education program of Harvard Medical School. The content is solely the responsibility of the authors and does not necessarily represent the official views of Harvard University and its affiliated academic health care centers.
Handoff Communication between Outpatient Clinics and the Emergency Department: A Needs Assessment for Developing Standard Tools and Training

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Abstract

Background: Miscommunication during transfers in patient care is a known leading source of medical errors. Standardizing handoff communication in the inpatient setting has been associated with reduced medical errors but less is known about best practices for the handoff of patients from outpatient clinics to the Emergency Department (ED).

Objective: The purpose of this study is to 1) identify key elements of handoffs from outpatient clinics to the ED to inform the development of a standardized handoff tool, 2) assess for the presence of key elements in audio-recorded handoffs, examining how handoff quality varies according to patient and provider characteristics, and 3) to identify potential associations between handoff quality and clinical outcomes in the ED.

Methods: The study uses both quantitative and qualitative methods and was conducted in two phases: 1) consensus development via stakeholder provider surveys and in-person meetings, and 2) retrospective observational study of audio-recorded verbal handoffs and associated medical chart documentation. Descriptive statistics measured importance of key elements. Chi-
square statistics compared proportions across provider groups. Qualitative content analysis identified themes in free-text responses. Univariate poisson and logistic regression models tested associations between patient and provider characteristics and miscommunications in the ED on handoff quality.

**Results:** 129/152 healthcare providers (85%) completed the survey. The handoff element indicated by most respondents to be very or extremely important to communicate was illness severity (96%). Free-text responses aligned with quantitative survey data regarding standard handoff content. In a random sample of 60 handoffs, a median of 6 out of 12 key elements were communicated. Miscommunications relevant to the patient’s care in the ED occurred in 28% of patient transfers. Handoffs where patient complexity prompted transfer were twice as likely to have a discrepancy in illness severity upon presentation to the ED (p=0.04).

**Conclusion:** Content and quality of handoff communication is variable when transferring patients from outpatient clinics to the ED. These results will inform the development of a standardized handoff tool and training in this context, and provide a benchmark for interventions targeted at improving quality of care surrounding patient transfers.
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Introduction

Improving the handoff process has become a priority in the patient safety movement at the level of the World Health Organization\(^1\), with a call for standardization of information transfer and dedicated training. The ability to safely transfer care through verbal and written communication as a patient transitions between clinical settings has been recognized as an essential physician competency by the Royal College of Physicians and Surgeons of Canada (RCPSC)\(^2\) and the Accreditation Council of Graduate Medical Education (ACGME).\(^3\)

Until recently, there was a paucity of high-quality data demonstrating the effectiveness of handoff improvement approaches such as the use of team communication training and the implementation of standardized handoff tools. There is an expanding literature on improving communication to facilitate inpatient care and discharge,\(^4\)\(^-\)\(^6\) but little is known about optimal strategies to standardize handoff communication in the outpatient setting, as patients transition from the community into the hospital. Prior research indicates that standardizing handoff communication in the inpatient setting is associated with improved information transfer and reduced medical errors. Preventable adverse events decreased by 30% after implementation of a handoff improvement program in a multicenter study.\(^7\) The potential benefit of a similar intervention has not been explored in the outpatient setting, though studies have identified a need to standardize communication processes during patient transfers from ambulatory care centers to the ED.\(^8\) A survey of EDs in the United States indicated that there is significant variability in handoff practices in this clinical environment, including both verbal handoffs and written documentation, despite the recent emphasis on education in transitions in patient care.\(^9\) Additionally, the quality of information provided can be variable, as indicated in a survey of ED
physicians, and the implications for patient care are unknown.

Transitions of care between outpatient clinics and the ED may be especially vulnerable to error given that communication often occurs asynchronously via telephone or written documentation, between providers of different training backgrounds distributed across varying practice environments. We anticipate that achieving high-reliability communication in this context will require a focus on the receiving provider. Prior to developing a targeted intervention to improve how handoffs are received, there is a need to define the components of high-quality handoffs to the ED, and to better understand how existing communication processes impact the quality of care upon the patient’s arrival to the ED.

The proposed purpose of this study is to establish an evidence-based standard for high-reliability communication when transferring patients from outpatient clinics to the ED. Proposed aims are:

1) To identify key elements of handoffs from outpatient clinics to the ED in order to inform the development of a standardized handoff tool.

2) To assess for the presence of key handoff elements in audio-recordings of a telephone communication line used to transfer patients into the ED, examining how handoff quality varies according to patient and provider characteristics.

3) To identify potential associations between components of high-quality handoff communication and clinical outcomes in the ED.
Methods

The study uses both quantitative and qualitative methods. We conducted the study in two phases: 1) consensus development with a representative group of stakeholder care providers via electronic survey and in-person meetings, and 2) retrospective observational study of audio-recorded verbal handoffs and associated medical chart documentation.

The setting is a freestanding pediatric hospital and affiliated clinics where outpatient clinic providers, when transferring a patient to the ED, place a phone call to a hospital-based central communication center. A written summary is documented by communication specialists (including paramedics, registered nurses or emergency medicine technicians with additional communication skills training) and made available for review in the medical record for ED physicians prior to patient arrival.

The study was approved by the Boston Children’s Hospital institutional review board.

Phase 1

Key elements of handoffs from outpatient clinics to the ED were identified through use of a modified nominal group process with a multidisciplinary group of care providers regularly involved in patient transfers in this context. The first round consisted of an electronic survey with questions in two main areas: 1) baseline perceptions of handoff communication quality, and 2) rated importance of key handoff elements. Participants were asked: “Which of these elements are most important in an ideal handoff, to enable the delivery of optimal care for patients transferred from outpatient clinics to the ED via the Communication Center?” A list of data elements was
proposed based on a review of the literature and consensus of study co-investigators. The survey was sent via divisional listservs to 76 ED providers, 51 primary care providers (PCPs) and 25 Communication Center staff (n=152) with experience transferring patients from the outpatient setting to the ED. Reminder invitations to participants were sent three times at four-day intervals and a small token of appreciation was offered to participants for completing the survey by a specified date.

The second round consisted of two in-person meetings of a representative group of participants from the first round. The first session included 4 ED providers, 1 Communication Center staff and 4 PCPs; the second session included 4 ED providers and 4 PCPs. On the day of the discussion, aggregate ratings of importance for each handoff element from the survey were shared with participants. Using a modified nominal group process, participants discussed each element in turn and refined concepts with feedback recorded by a moderator, prior to an individual vote to establish preferred responses.\textsuperscript{10,11}

The intended outcome was group consensus on key elements to be included in a handoff quality measure for this context. Final responses representing group consensus were incorporated into data collection forms in Phase 2.

**Phase 2**

Handoffs from the previous 90 days were eligible for review of audio-recordings and associated medical chart documentation. A random sample of one-hour timeslots was selected using a random number generator on an electronic spreadsheet. Inclusion criteria were: referring
provider from a primary care, urgent care, or subspecialty outpatient clinic; referring provider requesting outpatient transfer to the ED via the Communication Center telephone line; and patient seen in the referring clinic within 48 hours prior to the call. Handoffs were excluded if the audio-recording was incomplete or unavailable, or if the referring provider was calling from another ED, inpatient unit or intensive care unit.

We compared rates of inclusion of key data elements in a random sample of audio-recorded verbal handoffs. Each handoff was reviewed by a physician investigator (KH) or research nurse trained in the use of the data collection forms. The two reviewers performed a pilot review of 10 handoffs, discussed and resolved any discrepancies, clarified terminology, and revised the forms accordingly. A randomly selected 10% subset of handoffs was dual reviewed by the physician investigator to ensure quality of the data collection process. Handoffs were assessed for the presence or absence of 12 data elements identified through consensus development in Phase 1 and a review of the handoff literature. Transcribed handoffs in the medical chart were reviewed for any discrepancies with the verbal handoff pertaining to the 12 elements.

Non-identifying data were collected for all verbal handoffs including: type of healthcare provider accessing and answering the telephone line, handoff duration, and reason for transfer. Data obtained from the medical record of the transferred patient included patient age, relevant ED documentation, encounter diagnosis, and disposition. Reviewers also recorded the occurrence of any 1) miscommunications in the ED (including transfer of erroneous information and omissions of important information); 2) discrepancies in illness severity and diagnosis; and 3) reported
delays, redundant investigations and medical errors. Study data were collected and managed using REDCap\textsuperscript{12} electronic data capture tools hosted at Boston Children’s Hospital.

**Quantitative analysis**

For the analysis of close-ended survey responses, descriptive statistics were used to measure perceived quality and safety of the handoff process and importance of key data elements. Chi-square statistics compared proportions across provider groups.

Univariate poisson and logistic regression models were built to test the association between patient characteristics (age, reason for transfer, final diagnosis), provider characteristics (referring and receiving provider type, practice setting of referring provider, whether referring provider assessed the patient), and miscommunications in the ED on the number and type of data elements present in a handoff. Statistical significance was set at $p \leq 0.05$. All statistical analyses were performed using STATA software (version 12.1; StataCorp, College Station, TX).

**Qualitative analysis**

Qualitative content analysis was used to describe themes in free-text survey responses. Free-text survey data were analyzed using inductive methods,\textsuperscript{13,14} with immersion in free-text responses to identify emergent themes. A preliminary coding dictionary was developed and a random sample of 10\% of responses representing all provider groups were reviewed and coded by a physician (KH) and a qualitative researcher (MJ). The reviewers discussed coding discrepancies, refined definitions, and added emergent codes to the coding dictionary.\textsuperscript{13} Following this process of initial calibration, the primary reviewer (KH) coded all free-text responses using the method of
constant comparison to ensure consistency.\textsuperscript{15} Coded data were then reviewed to identify overarching themes and subthemes across responses. Frequent discussions between the co-investigators ensured agreement about themes and subthemes and allowed additional characterization of the themes.\textsuperscript{16} Illustrative quotations were selected for each subtheme.
Results

Phase 1

129/152 healthcare providers (85%) completed the survey: 70/76 ED providers (92%), 40/51 PCPs (78%) and 19/25 Communication Center providers (76%). Table 1 summarizes participant characteristics.

Process of handoff communication: Ninety-nine percent of ED providers reported that they frequently or always reviewed transcribed handoff documents prior to seeing the patient transferred from an outpatient clinic. Forty-two percent of all providers described the overall quality of the process of handoff communication as very good or excellent, and thirty-three percent of providers described the overall safety as very good or excellent (Figure 1).

Provider perceptions of specific aspects of handoff communication were mixed (Figure 2). Only 38% of ED providers felt that handoffs informed them of a patient’s clinical stability very or extremely well, yet 62% of PCPs and 73% of Communication Center providers responded handoffs achieved this purpose very/extremely well (p=0.013). There were also differing perceptions of how well handoffs convey the actions requested by the referring provider (very/extremely well indicated by 32% of PCPs, 55% of ED providers, and 67% of Communication Center providers; p=0.036).

Forty-three percent of providers reported that miscommunications occurred sometimes or frequently (no significant differences between provider groups, p>0.05). 16% of ED providers
indicated delays in care occurred sometimes or frequently; 20% indicated that problems with handoff communication led to unnecessary tests sometimes or frequently.

Content of handoff communication: Ratings of importance for five proposed key handoff elements are depicted in Figure 3. Illness severity was indicated by 96% of providers as being very/extremely important to communicate. There were differing opinions on the importance of a synthesis (very/extremely important indicated by 51% of ED providers, 63% of Communication Center providers, and 76% of PCPs; p=0.014).

Free-text comments: 103 of 129 respondents provided written responses to free-text questions. Responses supported the quantitative survey findings. Content analysis of responses revealed six sub-themes related to process and content of handoff communication from outpatient clinics to the ED:

1) Information flow via central Communication Center: Referring providers appreciated that accessing a “receiving” provider via a telephone communication line was “easy and fast”. However, concerns were noted that information may be lost or delayed during time periods where there are a high number of calls. 2) Standard process: Providers described variability in the handoff information that is given, prompted, and displayed in the ED. There was general agreement that a standard set of information should be included and recorded, by providers with standard training, particularly with an understanding of the clinical relevance of the handoff content. 3) Closed-loop communication: Providers expressed mutual frustration with the transfer of information back to the outpatient setting after referral to the ED. Primary care
providers felt there were insufficient “calls back” from the ED to discuss patient management, and ED providers described often lacking appropriate call-back information to be able to “close the loop”, particularly after regular clinic hours. 

4) **Key information needed:** Providers described a core set of content that should be present or all handoffs from outpatient clinics to the ED, including the referring provider’s primary concern and expectations surrounding transfer, a statement of patient stability, and basic relevant clinical information. 

5) **Complex cases:** Providers described cases where additional or different information may be indicated, including a more extensive discussion of expectations and contingency planning for patients with medical complexity. 

6) **Miscommunication and perceived harm:** Providers described situations where key information was not communicated, and their concerns that patients experience delayed care and unnecessary tests as a result.

Table 2 summarizes these themes and subthemes with illustrative quotations representing perspectives of PCPs, Communication Center and ED providers.

**Phase 2**

Handoffs occurring in 81 randomly selected one-hour timeframes from November 2016 – January 2017 were reviewed. Sixty out of 1511 audio-recordings met inclusion criteria. Table 3 summarizes characteristics of the study sample.
The majority of referrals were from physicians (70%), from primary care (72%), and by a provider who had personally assessed the patient (90%). The most common reason for transfer to the ED was the need for additional investigations/work-up (60%).

**Verbal handoffs:** Verbal handoffs were reviewed for the presence of 12 data elements incorporated into a handoff quality measure after Phase 1 (see Appendix). Handoffs included a median of 6 (5, 7) elements. Rates of inclusion for each data element ranged considerably (Figure 4). Contact information was included in 100% of handoffs, and no handoffs contained contingency plans or pending test results. Synthesis occurred in only one case (2%). In this case, when the receiving provider in the Communication Center synthesized key points for the transfer of a child with medical complexity with acute care needs, the referring provider alerted him/her to a relevant omission.

The median duration of verbal handoff was 2 minutes 39 seconds (1 minute 56 seconds, 3 minutes 37 seconds). 27% of verbal handoffs included one or more interruption.

41% of patients were transferred to the ED because of acuity (i.e. respiratory distress, dehydration). An explicit comment on patient stability was included the handoff in 46% of all sampled audio-recordings, and in 44% of recordings where the reason for transfer included acuity. Providers were more likely to provide vital signs when acuity prompted patient transfer, compared to all cases (60% and 39% respectively, p=0.013).
Expectations for transfer to the ED were more likely to be conveyed by the referring provider if the person calling had personally assessed the patient (β = 2.96, p = 0.002, 95% CI [0.99, ∞]).

There was no association between the number of key elements and handoff duration, patient age, reason for transfer, practice setting of referring provider, referring provider type, whether the referring provider had personally assessed the patient, receiving provider type, final diagnosis, or patient disposition.

Transcribed handoffs: Transcribed handoffs included a discrepancy involving one of 12 key elements in, on average, 20% of handoffs. Most discrepancies involved the referring provider’s expectations (18%). Examples of discrepancies in transcribed handoffs included: failing to transcribe vital signs (i.e. significant orthostatic change in heart rate), tasks completed in clinic (i.e. acetaminophen dose, discussion with subspecialist), referring provider concerns (i.e. suspected osteomyelitis), and requested management (i.e. MRI, close monitoring); and incorrect transcription of patient blood type.

Transcription discrepancies were not significantly associated with the Communication Center provider’s training background or with the number of calls received in the Communication Center in a one-hour time period.

Medical chart review: In ED documentation, acknowledgment of the referral from the outpatient clinic provider was present 75% of the time. In handoffs where the referring provider identified
expectations for management (62%), the patient fully received this management in the ED 65% of the time. Callback to the referring provider was documented 25% of the time.

28% of patient transfers involved a miscommunication relevant to the patient’s care in the ED. In some cases, important information was omitted relating to key features of the patient’s medical history (i.e. an underlying genetic syndrome, or low baseline oxygen saturation in a child with cardiac disease), or to aspects of clinic assessment/management (i.e. point-of-care blood glucose result, or an acetaminophen dose given in clinic). In other cases erroneous information was transferred, for example, an incorrectly transcribed patient blood type was then reported in the ED documentation.

In 23% of handoffs, there was a discrepancy in illness severity conveyed verbally and the patient’s clinical status upon presentation in the ED. Handoffs where patient complexity prompted patient transfer were twice as likely to have a discrepancy in illness severity upon presentation to the ED ($\beta=2.15$, $p=0.04$, 95%CI [0.06, 4.67]).

There was no association between total number of key elements and the occurrence of a miscommunication in the ED. Handoffs where a comment on patient stability was omitted tended to be more likely to have a miscommunication occurring in the ED, significant at $\alpha=0.01$ ($\beta=-1.16$, $p=0.086$, 95%CI [-2.37, 0.02]).

In one case, imaging was repeated as there was no access to the radiograph from the outside center (2%).
No medical errors were identified in the sample.
Discussion

Twelve key data elements for handoffs from outpatient clinics to the ED were identified by stakeholders in the patient transfer process, informing an analysis of patterns of communication and patient care in the ED. In our sample of 60 handoffs via a central Communication Center, we identified variable inclusion of key elements, discrepancies between verbal and transcribed handoffs, and miscommunications relevant to patient care in the ED.

Context

Communication failures contribute to two-thirds of sentinel events reported to The Joint Commission, over half of these cases involving handoffs.\textsuperscript{17} National organizations have called for standardized communication processes for patient handoffs, including a defined set of core transfer information, dedicated training for providers, and clear outcome measures to ensure continuous quality improvement.\textsuperscript{18,19} The study of handoff interventions to date has focused on improving communication in the inpatient setting. A multicenter study evaluated the effectiveness of a handoff “bundle” including communication skills training and standardization of verbal and written handoffs using the I-PASS mnemonic: Illness Severity, Patient Summary, Action List, Situation Awareness & Contingency Planning and Synthesis by Receiver.\textsuperscript{20} The I-PASS study demonstrated improved communication quality and a significant reduction in medical errors associated with implementation of the intervention on the hospital wards.\textsuperscript{7}

There is limited information available on communication processes and related clinical outcomes in the outpatient setting. A recent systematic review of the literature on transitions from
outpatient to acute care identified only 20 articles evaluating direct provider-to-provider communication, most of which were cross-sectional with varied contexts and inconclusive results, and only six articles evaluated clinical outcomes (including 30-day readmissions, mortality, patient and provider satisfaction). The Transitions of Care Consensus Policy statement describes the communication between ambulatory and hospital providers surrounding transitions to the ED as being essential to high-quality patient care. In our study, less than half of providers felt that the quality of the current handoff process is very good or excellent, indicating a need for strategies to ensure high-reliability communication in this context.

**Process of Handoff Communication**

At our institution, two handoffs must effectively occur in the outpatient-to-ED transfer: a verbal handoff from a clinician via a central telephone line, and a transcribed handoff provided in turn to the ED. This process may be vulnerable to miscommunication for a few reasons. Telephone conversations preclude the ability to recognize non-verbal cues, and written handoff communication may be ambiguous or contain unanswered questions. This represents two opportunities for faulty information transfer. Communication failures may also relate to hierarchical differences between providers. In the outpatient-ED transition, where there is a distinct asymmetry in provider training and practice setting, structured communication tools may be particularly important for ensuring reliable transfer of information.

Providers value the efficiency of accessing a person via a central Communication Center to verbally convey clinical information, as indicated in free-text survey responses. However, a
number of participants acknowledged concerns with information flow during high-volume time periods and to providers of varied levels of training. Only a small fraction of calls to the Communication Center reviewed in this study met inclusion criteria, as these providers also manage communications surrounding inter-hospital transfers and critical care transports. In our survey, Communication Center providers describe the challenge of “closing the loop” and capturing accurate and complete information during time periods with a high volume of calls. Indeed, one in five handoffs in our sample involved a discrepancy between verbal to written handoff pertaining to a key data element, and 27% of handoffs involved at least one interruption. Though discrepancies in transcription were not associated with high-volume time periods or with Communication Center provider training background in our sample, a more streamlined and structured handoff process and related training may help reduce cognitive load for busy providers with a critical role for managing handoff communication.26

Given the inherent challenges to handoffs in outpatient-to-ED transitions, employing evidence-based techniques to prevent miscommunications is critical. A synthesis or “read-back” of key points in the handoff is recognized as a feature of high-quality communication.18 Though the person receiving verbal handoff in the Communication Center is not ultimately the person “receiving”, or assuming care of, the patient, synthesizing what was heard and transcribed may alert both providers to erroneous or omitted information. In one handoff in our sample, the Communication Center provider synthesized what was verbally conveyed, and it resulted in a clarification of the expectations for transfer and a change in what was documented. Instituting “read-back” as standard practice for the receiving provider to clarify understanding may be an important opportunity to improve reliability of the handoff communication process.
Content of Handoff Communication

All stakeholder provider groups in our survey identified a need for standardized communication during outpatient-to-ED transitions, to ensure that essential information is reliably transferred for every patient. In our retrospective handoff review, there were extremely variable rates of inclusion of the 12 data elements, with each handoff typically including only half of these elements. Communication Center providers frequently prompted information from the referring provider (i.e. to clarify clinical status and capture callback information) during the verbal handoff, but these prompts were inconsistent depending on the patient case and provider receiving the call. Though 12 data elements were incorporated in our handoff quality measure, stakeholder providers discussed potential indications to adjust the amount of information provided—for instance, a full set of vital signs may be less important to convey for an otherwise healthy child with a laceration requiring sutures, and contingency planning is particularly critical for a child with medical complexity in respiratory distress. Further study is needed to define clear indications for a subset of these data elements to better understand important gaps in information transfer.

Outpatient-to-ED handoffs can provide valuable information to the ED provider who will assume responsibility for the patient’s care. Outpatient clinic providers are often familiar with a patient’s medical history and baseline clinic status, have performed a recent clinical assessment, and may have already completed important tasks in the care of the patient including ordering investigations, calling consultants and administering treatments. In one cross-sectional study exploring perceptions of 73 hospitalized patients, 90% reported that their PCP held important
information needed to inform the care provided by the inpatient provider. Transfer to the ED represents an opportunity to support and extend care provided by the outpatient clinic provider, if there is appropriate information transfer surrounding the referral. In a study of adult patients presenting to the ED, an information gap (i.e. physician-reported inability to access important clinical information) occurred in almost a third of ED visits. Most commonly, ED providers were missing key features of medical history, previous clinical assessments and laboratory results, and these gaps were associated with increased length-of-stay in the ED. Notably, information gaps were more common among patients referred to the ED by a community provider than among patients without a referral.

There are many reasons why a patient may be referred to the ED from an outpatient clinic, including concern for acuity, need for additional workup, or an anticipated need for admission. Expectations upon transfer may include specific investigations, consultations, or treatments. One study of referrals to a pediatric ED identified one in five referral forms were missing reason for transfer, and expectations often required clarification during follow-up telephone contact. However, in this study the additional information about expectations did not change practice. Our qualitative analysis revealed differing opinions on the need for outpatient provider input on management in the ED. ED providers felt that knowing referring provider expectations is important to ensure they don’t “reinvent the wheel”—a potential source of delays in care and unnecessary resource use. It is interesting that expectations are the aspect of communication most commonly implicated in discrepancies between verbal and transcribed handoffs. It may be that the management anticipated by the PCP is not adequately emphasized in the verbal handoff, or perhaps it is not routinely recognized as key information to transcribe for the ED provider. In
our survey, PCPs perceived that requested “action items” were conveyed very or extremely well only a third of the time, significantly less than other provider groups. One explanation for this differing perception is that PCPs may feel ill-equipped to identify appropriate management upon determining their clinic patient requires transfer to higher-level care. Another explanation emerged in our qualitative analysis—many PCPs expressed the concern that their expectations may not be taken into account in the ED, which may discourage them from proposing particular “action items”. In our sample, when referring provider expectations were expressed, patients received the specified management 65% of the time—though it is unclear how or whether their care was influenced by these expectations. Referring provider expectations may not be fulfilled in the ED either because they are not clearly transcribed, not recognized by the ED provider, or because the anticipated management was not felt to be indicated on assessment in the ED. Regardless of the reason, the disconnect between anticipated and actual management highlights an opportunity for establishing a shared mental model through closed-loop communication with the referring provider.

Referring providers are expected to provide contact information of someone who can respond to questions and concerns during transitions in patient care. In one study of patients referred to an ED by their general practitioner, a reply from the ED to the general practitioner was documented in only 40% of cases. In another study of ED referral letters from general practitioners in a five-month period, 16-28% received a return telephone call from the ED, and providers indicated the communication to be useful when it did occur. A “callback” to providers referring a patient to the ED was documented in only 25% of handoffs in our sample. There may be inconsistency in documentation of callback in the medical chart, or there may be logistical challenges of direct
clinic-to-ED communication. One study of consultants attempting to contact the primary physician found that they were only able to reach the provider 65% of the time using the given contact information. Stakeholder providers indicated the need for improved communication of referring provider’s specific request for follow-up (i.e. prior to ED assessment, during work-up or at time of disposition), including contact information outside of standard clinic hours. Incorporating these data elements into handoffs may facilitate conversation between providers to establish a shared understanding of management and the timing and purpose of follow-up.

The data element considered the most important to convey in outpatient-to-ED handoffs across stakeholder groups was illness severity. Our survey identified differing perceptions between provider groups of how well the assessment of clinical stability is actually conveyed. ED providers felt that this element was communicated very/extremely well only 38% of the time, which may reflect a higher standard for clear assessments of stability fostered in their specialty training, and a clinical context that relies on accurate triaging based on acuity. Patient stability was communicated in less than half of all handoffs in our sample, regardless of whether an acute medical concern prompted patient transfer. Handoffs where a comment on patient stability was omitted tended to be more likely to have a miscommunication occur relevant to patient care in the ED. More in-depth study is needed to better understand this relationship and the impact on clinical outcomes.

**Implications for Patient Care**

A relatively high percentage of handoffs involved a discrepancy in illness severity upon presentation to the ED (23%). We employed a broad definition, include cases where the child
appears “sicker” than anticipated based on the verbal handoff (i.e. presents with abnormal vital
signs not conveyed in the handoff, or requires intensive care), as well as cases where the patient
presents more stable than anticipated. It may be that there are different perceptions of urgency
from providers in different training backgrounds or clinical contexts, as suggested in one mixed-
methods study of physician and nurse communication. It is also notable that cases where
patient complexity prompted referral to the ED were more likely to involve a discrepancy in
illness severity. It may be that children who are characterized by medical complexity are more
likely to fluctuate in their clinical status during transfer, or that providers differ in their
perception of stability compared to a patient’s baseline clinical status, or that it is more
challenging for providers to clearly communicate their assessments of complex patients. In this
study, complexity was indicated as a reason for transfer if the referring provider indicated in their
handoff that the patient had “a complex medical history”, described chronic conditions followed
by a subspecialist, or if the patient is dependent upon medical technology. This working
definition aligns with a framework of children with medical complexity proposed by Cohen et
al. Further analyses incorporating the pediatric complex chronic condition classification system
are needed to verify and further explore associations between medical complexity and quality of
communication surrounding transfers in care. Given that the prevalence of children with
medical complexity is increasing, due to improved medical technologies and advances in care,
ensuring reliable information transfer during care transitions for a population vulnerable to
medical error is all the more critical.

Miscommunications have potential to impact quality and safety of patient care surrounding
transfers. In this study, miscommunications were defined as the transfer of erroneous information
or the omission of relevant information in patient handoff from an outpatient clinic to the ED. We recorded a considerably high frequency of miscommunications (32%), which may speak to the fact that there are two opportunities for faulty information transfer between providers via a central Communication Center. There is a need for more research evaluating the effects of miscommunications on clinical outcomes such as preventable adverse events, and efficiency outcomes such as healthcare costs, length-of-stay, and number of laboratory tests. In a study of referral letters from general practitioners to the ED, approximately 20% included reports of investigations already performed, reducing the number of tests that were repeated in the ED by almost half (some were repeated due to clinical indication and as protocol) and representing notable cost savings for the institution. Beyond a concern for increased healthcare costs, there has been a recent call to recognize excessive resource utilization, including unnecessary testing, as a patient safety issue. We identified one case where a chest radiograph was repeated when documentation indicated that it was not available from an external site. We may underestimate the occurrence of repeated tests, if they are not verbally reported or accessible from outpatient clinic records. Future prospective study will allow identification of redundant investigations, as well as assessment of patient and provider satisfaction with transfers, and assessment of closed-loop communication upon ED discharge. Further analyses of our sample will also seek to identify delays in care by testing associations between communication quality and length-of-stay in the ED.

Limitations of the study include the fact that it was performed in single large tertiary pediatric hospital where there is primarily indirect communication between providers via a central telephone line. It is unclear how generalizable these findings will be to other settings. Yet
development of our handoff quality measure was informed by a large multidisciplinary stakeholder group representing different practice settings and training backgrounds, and other large tertiary centers have a similar process involving a central telephone referral system. The audio-recorded handoff and chart review comprised a relatively small sample which may have limited our ability to identify meaningful patterns in communication and implications for patient care. Handoff communication was assessed by two independent reviewers and the data collection tools were piloted to identify discrepancies and refine definitions, yet there may be subjectivity in identifying the presence of handoff elements and miscommunications. This initial exploratory study will inform future iterations in a larger sample with a formal evaluation of inter-rater reliability.

Our findings reveal opportunities for ensuring high-reliability communication surrounding outpatient-to-ED transfers, with the consistent provision of information necessary for optimal patient care. We identify variability in how handoffs are given (number and types of key elements conveyed verbally by the referring provider) and received (number and types of key elements transcribed and prompted by the Communication Center provider). The provider “sending” a patient is typically considered to be responsible for ensuring complete transfer of relevant clinical information. However, in this context, a different paradigm may be more effective in standardizing handoff communication: given the number of referring providers, of different training backgrounds distributed across varying practice environments, the “receiving” central referral site may be the most effective driver for ensuring a reliable handoff process. Thus, this study will inform a bundled communication intervention to improve how handoffs are received: standard templates to ensure reliable transfer of key data elements, education and
dissemination of the new communication process, and ongoing feedback regarding communication practices and clinical and satisfaction outcomes. A new approach will constitute a change in culture, not simply a mnemonic or tool, and will require collective input from ED, Communication Center and outpatient clinic providers.
Conclusion

This analysis reveals important patterns in handoff communication from outpatient clinics to the ED, a context where best practices have not been previously characterized. We identified variable content and quality of handoff communication and the occurrence of miscommunications surrounding patient transfer, indicating a need for targeted tools and training. Next steps include the development and implementation of a receiver-driven bundled handoff intervention in collaboration with stakeholder care providers. Our study lays the groundwork for meaningful measures of communication quality and outcomes in this context, and highlights the potential to improve quality of care through high-reliability communication during an important transition.
References


8. Gardner R, Choo EK, Gravenstein S, Baier RR. “Why is this patient being sent here?”: 


17. Sentinel event data: Root causes by event type. *Jt Comm.*

doi:10.1007/s11606-009-0969-x.


Pooled respondents from ED, Primary Care, and Communication Center (n=129).
No differences between provider groups (all p<0.05).

Figure 1: Perceived quality and safety of handoff communication process from outpatient clinics to the ED.

* p<0.05
Other response options included not at all, slightly, moderately well

Figure 2: Perceptions of how well each key element was communicated in handoff from outpatient clinic providers to the ED via the Communication Center in the previous 90 days.
Figure 3: Percentage of providers indicating each key element to be very/extremely important.

Figure 4. Percentage of Verbal Handoffs That Included Key Data Elements
Audio-recorded verbal handoffs were evaluated for presence of the key elements: patient stability, vital signs, summary statement of events leading to ED referral, clinic assessment, tasks completed, reason for transfer, expectations upon transfer, pending test results, contingency plans, name and contact information of referring clinician, request for follow-up, and synthesis.
### Tables

#### Table 1: Characteristics of Survey Participants

<table>
<thead>
<tr>
<th>Stakeholder group</th>
<th>No. (%) of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED</td>
<td>70 (54)</td>
</tr>
<tr>
<td>Communication Center</td>
<td>19 (15)</td>
</tr>
<tr>
<td>Primary care</td>
<td>40 (31)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Provider type</th>
<th>No. (%) of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>100 (77)</td>
</tr>
<tr>
<td>Attending</td>
<td>84 (65)</td>
</tr>
<tr>
<td>Fellow or Resident</td>
<td>16 (12)</td>
</tr>
<tr>
<td>Registered nurse</td>
<td>7 (5)</td>
</tr>
<tr>
<td>Nurse practitioner</td>
<td>8 (6)</td>
</tr>
<tr>
<td>Emergency medicine technician</td>
<td>10 (8)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (3)</td>
</tr>
</tbody>
</table>

#### Table 2: Themes Identified in Free-Text Responses with Exemplar Quotations

<table>
<thead>
<tr>
<th>Theme</th>
<th>Subtheme</th>
<th>Category</th>
<th>Exemplar Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process of handoff</td>
<td>Information flow via central Communication Center</td>
<td>Efficiency</td>
<td>“Calling [the telephone communication line] is easy and fast. Someone always picks up within a few rings, one gets prompted on patient info, and then one gives the patient info” (PCP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“Most calls are received on behalf of the ED attending which helps with patient flow and continuity within the ED.” (Communication Center)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“Efficient, relays some basic helpful information regarding the patient without requiring a busy ED provider to speak directly with every provider sending a potentially very stable patient from clinic.” (ED)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High volume</td>
<td>“The Communication Center is a really busy environment and could become overwhelming at times. We have limited staff and could use more resources. This leads to delays in relay of information and or not 'closing the loop' on certain call details, due to our number of calls.” (Communication Center)</td>
</tr>
<tr>
<td>Standard process</td>
<td>Participants described positive and negative aspects of handoff information transfer through a provider on a central telephone line</td>
<td>Standard information gathering</td>
<td>“There are variable 'questions asked' on the other end [of the telephone line]—sometimes it seems like someone who gets it and sometimes it does not.” (PCP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“The form of the narrative could be standardized to ensure all details are covered. Departure from consistent chronology is a common issue.” (Communication Center)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard training of receiving provider</td>
<td>“I have at times been providing information regarding medically complex patients and feel as though the person I am speaking to has no medical/clinical background making understanding what I am saying difficult.” (PCP)</td>
</tr>
<tr>
<td>Closed-loop communication</td>
<td>Participants describe challenges with communication back to the referring provider regarding</td>
<td>Feedback to referring provider</td>
<td>“I don't get much feedback that the ER providers have taken into account the information; maybe the intake could be part of the ER note” (PCP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“Increase communication when plan/disposition is being decided so that referring provider can have input into that process.” (PCP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Call-back information for referring provider</td>
<td>“There is no closed loop communication for our practice. We do not routinely get call-backs” (PCP)</td>
</tr>
<tr>
<td>Theme</td>
<td>Subtheme</td>
<td>Category</td>
<td>Exemplar Quotations</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
<td>----------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>Content of handoff communication</strong></td>
<td>Key information needed</td>
<td>Concerns and expectations</td>
<td>“The most helpful information is about what the clinic provider is concerned about and what evaluation they want performed. (ED) “When the [transcribed handoff] states the goals and what has already been done, that is most helpful” (ED) “I think ensuring all the clinics… use [the telephone communication line] for effective communication of what they are worried about and or would like to happen.” (ED)</td>
</tr>
<tr>
<td></td>
<td>Patient stability</td>
<td>“The illness severity is really important but I think the one that is most poorly conveyed via the [telephone communication line] line” (PCP) “[Conveying illness severity] is quite important as it sets the tone for the report to follow” (Communication Center) “use of this moniker is really helpful in stratifying level of concern - but only if provided by the REFERRING provider (and then communicated by [the Communication Center]) …and then could use anyone identified as watcher or unstable as warranting a direct call to ED attending” (ED)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Basic relevant history</td>
<td>“a clear concise picture of what the person may look like when he/she gets to our ED.” (CC) “Brief summary of pt, chief complaint bringing them in now.” (ED)</td>
<td></td>
</tr>
<tr>
<td><strong>Complex cases</strong></td>
<td>Participants describe special cases where different or additional handoff information is helpful</td>
<td>Deeper discussion</td>
<td>“for some kids, I'd like to just say something along the lines of 'has a non-urgent lac,' while for sicker children, I would want to have a more in-depth discussion about my concerns and expectations. yet it seems like I'm always guided (restricted?) to giving the same amount of information about every patient - too much for most and not enough for those really at risk - and that that information is only accessed when the ED provider wants to see it, but not 'pushed' to them.” (PCP)</td>
</tr>
<tr>
<td></td>
<td>Contingency planning</td>
<td>“For the vast majority of patients we send to the ED, the ED providers know what appropriate contingency planning should be. However, its the more complicated patients that really that the PCP knows best, for whom a discussion of contingency is so important.” (PCP) “…[contingency plans] useful in certain high risk patients (should not get sedation, has a difficult airway) but not routine care” (ED)</td>
<td></td>
</tr>
<tr>
<td><strong>Miscommunication and perceived harm</strong></td>
<td>Participants describe cases where important handoff information is lacking, and implications for patient care upon transfer.</td>
<td>Missing key information</td>
<td>“When I read the [transcribed handoffs] after submitting them, they are often very incomplete, missing key information. Most often I see co-morbidities, workup performed in primary care, or primary care vital signs not passed on in the [transcribed handoff].” (PCP) “ Asking for [past medical history] and the reply is 'none' when in fact the patient has a relevant medical history” (CC) “missing information regarding clinic interventions (medications given, labs done) or missing pertinent components of history exam in clinic” (ED)</td>
</tr>
<tr>
<td></td>
<td>Unclear expectations</td>
<td>“sometimes I send a patient over with an expectation of care (ie., admit for dehydration) and I get a call back after they've sent the patient home - when I had concerns (that I indicated in [verbal handoff]) about the patient that they've not taken into account” (PCP) “It is sometimes difficult to understand why a provider sent the patient in- for instance if a provider was concerned about meningitis but the patient arrived very well appearing.” (ED) “Unclear plan and 'reinventing the wheel' when the patient arrives” (ED)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential harms</td>
<td>“Unless the case is unusually straightforward (bronchiolitis) it has been riddled with miscommunication and safety concerns. Even asthma when inhalation treatments and steroids have been given prior to transfer have been concerning for medication errors.” (PCP) “repeat labs drawn that were not needed, delays in care” (ED)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3: Characteristics of the Sample of Handoffs from Outpatient Clinics to the ED (n=60)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (%) of handoffs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Practice setting of referring provider</strong></td>
<td></td>
</tr>
<tr>
<td>Primary care</td>
<td>43 (72)</td>
</tr>
<tr>
<td>Subspecialty</td>
<td>8 (13)</td>
</tr>
<tr>
<td>Urgent care</td>
<td>9 (15)</td>
</tr>
<tr>
<td><strong>Type of referring provider</strong></td>
<td></td>
</tr>
<tr>
<td>Physician</td>
<td>42 (70)</td>
</tr>
<tr>
<td>Registered nurse</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Nurse practitioner</td>
<td>11 (18)</td>
</tr>
<tr>
<td>Physician assistant</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Unclear</td>
<td>1 (2)</td>
</tr>
<tr>
<td><strong>Patient seen by calling provider</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>54 (90)</td>
</tr>
<tr>
<td>No</td>
<td>5 (8)</td>
</tr>
<tr>
<td>Unclear</td>
<td>1 (2)</td>
</tr>
<tr>
<td><strong>Type of receiving provider</strong></td>
<td></td>
</tr>
<tr>
<td>Emergency medicine technician</td>
<td>34 (58)</td>
</tr>
<tr>
<td>Registered nurse</td>
<td>5 (8)</td>
</tr>
<tr>
<td>Paramedic</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Communication specialist</td>
<td>20 (33)</td>
</tr>
<tr>
<td><strong>Reason for transfer</strong>*</td>
<td></td>
</tr>
<tr>
<td>Acuity</td>
<td>24 (40)</td>
</tr>
<tr>
<td>Complexity</td>
<td>6 (10)</td>
</tr>
<tr>
<td>Additional investigations/workup</td>
<td>36 (60)</td>
</tr>
<tr>
<td>Subspecialty consultation</td>
<td>19 (32)</td>
</tr>
<tr>
<td>Surgical intervention</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Admission</td>
<td>11 (18)</td>
</tr>
<tr>
<td>Emergency procedural care (i.e. fracture, laceration)</td>
<td>9 (15)</td>
</tr>
<tr>
<td>Other</td>
<td>10 (17)</td>
</tr>
<tr>
<td><strong>Disposition</strong></td>
<td></td>
</tr>
<tr>
<td>Admit to inpatient unit</td>
<td>21 (35)</td>
</tr>
<tr>
<td>Admit to intensive care</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Discharge home</td>
<td>35 (58)</td>
</tr>
</tbody>
</table>

*may involve >1 reason
## Appendix: Outpatient-to-ED Handoff Communication – Telephone/Transcribed Handoff Assessment

**Indicate the presence or absence of a specific element used in the verbal handoff**

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Whether transcribed handoff agrees with verbal handoff</th>
<th>Source of disagreement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>mostly/ completely</td>
</tr>
<tr>
<td><strong>Illness Severity</strong></td>
<td>Comment on patient stability (<em>i.e. stable, watchful, unstable</em>)</td>
<td></td>
<td>Yes, partially</td>
</tr>
<tr>
<td></td>
<td>Provision of vital signs</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Patient Summary</strong></td>
<td>Summary statement of events leading up to ED referral (<em>including key features of PMHx</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clinic assessment of patient problem (<em>HPI, physical exam findings</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>States tasks that have been completed (<em>test results, treatments given, consults called</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explicitly states reason for transfer (<em>specific concern to be addressed</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Action List</strong></td>
<td>Expectations for transfer to ED (<em>tests, treatments, consults</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of any pending tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Situation Awareness</strong></td>
<td>Contingency plans discussed (<em>if/then format</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Name/contact information of clinician who saw the patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specific request for follow-up (<em>callback about ED assessment requested, before/during/after/not at all</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Synthesis by Receiver</strong></td>
<td>Ensures receiver understands what was heard (<em>confirms primary concern, expected actions</em>)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Indicate the extent to which the behavior or element listed below was observed in the verbal handoff.

<table>
<thead>
<tr>
<th>Behavior / Element</th>
<th>N/A / Unable to assess</th>
<th>Not at all</th>
<th>To a small extent</th>
<th>To a moderate extent</th>
<th>To a great extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>The handoff was well-organized</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The pace of the handoff was appropriate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The length of the handoff was appropriate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear language was used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The handoff was uninterrupted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No tangential/unrelated information was included</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A high-quality patient summary is provided (includes relevant/important patient information)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What is one aspect that was especially effective about the handoff?  
What is one aspect of the handoff that could be improved?  
Additional comments: