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"Anybody on this list that you're more worried about?" Qualitative analysis exploring the functions of questions during end of shift handoffs

Colleen M O'Brien,[1,2,3] Mindy E Flanagan,[3] Alicia A Bergman,[3,4] Patricia R Ebright,[5] Richard M Frankel[1,3,6]

For numbered affiliations see end of article.

Correspondence to
Colleen M O'Brien Indiana University School of Medicine, 340 W 10th St #6200, Indianapolis, IN 46202, USA; colmobri@iupui.edu

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ABSTRACT

Background Shift change handoffs are known to be a point of vulnerability in the quality, safety and outcomes of healthcare. Despite numerous efforts to improve handoff reliability, few interventions have produced lasting change. Although the opportunity to ask questions during patient handoff has been required by some regulatory bodies, the function of questions during handoff has been less well explored and understood.

Objective To investigate questions and the functions they serve in nursing and medicine handoffs.

Research design Qualitative thematic analysis based on audio recordings of nurse-to-nurse, medical resident-to-resident and surgical intern-to-intern handoffs.

Subjects Twenty-seven nurse handoff dyads and 18 medical resident and surgical intern handoff dyads at one VA Medical Center.

Results Our analysis revealed that the vast majority of questions were asked by the Incoming Providers. Although topics varied widely, the bulk of Incoming Provider questions requested information that would best help them understand individual patient conditions and plan accordingly. Other question types sought consensus on clinical reasoning or framing and alignment between the two professionals.

Conclusions Handoffs are a type of socially constructed work. Questions emerge with some frequency in virtually all handoffs but not in a linear or predictable way. Instead, they arise in the moment, as necessary, and without preplanning. A checklist cannot model this process element because it is a static memory aid and questions occur in a relational context that is emergent. Studying the different functions of questions during end of shift handoffs provides insights into the interface between the technical context in which information is transferred and the social context in which meaning is created.

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INTRODUCTION

It is well-established that, 'The primary objective of a 'handoff' is to provide accurate information about a patient's care, treatment and services, current condition and any recent or anticipated changes'.[1] What is less well-established and less clear are the principles, practices and research that will systematically lead to safe and effective handoffs within and across different disciplines and settings. Much of the research literature on handoffs has been based on studying the quality and content of information and responsibilities transferred from one health professional to another.[2] The predominant conceptual framework for this work has been a sender/receiver model that treats information transfer as mechanical, much as one might pass a baton in a relay race or receive a telegram; it is a one-way communication.[2–4] In contrast, social interaction researchers have argued that handoffs are better understood as complex socially situated events in which two speakers use language and technology to accomplish the transfer of rights, duties and obligations from one professional to another.[2 5–7] From this vantage point, handoffs may be viewed as context-sensitive coordinated sequences of task-oriented speaking and listening activities within which questions play an important role.

Research on questions and questioning

Questions and questioning have been studied by linguists and conversation analysts in a number of professional settings including medicine, law, education and aviation, and in casual conversation. In bureaucratic settings, such as the courtroom, there are defined constraints on who can ask (substantive) questions.[8] For example, an attorney may ask, 'Where were you on the night of August 11th?' but the defendant does not have the right to ask the attorney about his whereabouts in return. Although not formally prescribed, the same holds true to a lesser extent in medical encounters and classrooms where doctors and teachers ask the preponderance of questions.[9 10] In highly constrained interactional contexts, the number of questions one asks is seen as a measure of dominance in the interaction as has been shown in multiple studies of physician–patient communication.[11 12] In aviation, the directness of the question asked has been related to power, with less powerful crew members likely to use indirect communication and questions.[13 14] In theory, there are no constraints on who can ask questions in casual conversation, although doing so habitually would likely be seen as being 'pushy' or 'nosy'.[15] In short, questions and questioning have different functions and carry different constraints, valences and expectations depending on the contexts in which they occur.

Questioning during handoffs

The importance of questions and questioning during handoffs has been recognised as a practical matter and component of handoff policy. Some authors recommend that the outgoing professional (Outgoing) should encourage questioning or provide an opportunity for the incoming professional (Incoming) to ask questions.[2 4] At least two studies, however, have found that Incomings do not ask many questions or engage in activities such as note taking that would add to their understanding or prioritisation of plans to act once the handoff is completed.[16 17] More pointedly, in its 2006 National Patient Safety Goal 2E (now an accreditation standard), the Joint Commission recommended the implementation of 'a standardized approach to handoff communications, including an opportunity to ask and respond to questions'.[18] Finally, being able to ask questions, clarify information and elicit details about information that was not understood has been recognised as a strength in nurse handoffs.[19]

Despite interest and policies aimed at questions and questioning, relatively few studies have looked at how questions actually function during handoffs. Most studies focus on the frequency or absence of questions and not their linguistic or interactional function(s). As well, most have focused either on physicians or nurses in isolation, not both operating on the same geographic units.[20–23] A few researchers have examined questioning during handoffs in more depth; from this work, four types of questions have been reported: (1) 'conversational repair-related' questions requesting a restatement of information already given due to problems in hearing or interruption;[24] (2) requests to clarify information already given;[19 25] (3) requests for missing or inadequate information;[5 21 26 27] and (4) formulations of alternative hypotheses about a patient's fundamental or likely trajectory.[5] Given the limited research to date, we were interested in characterising the functions of questions in a convenience sample of recorded resident, nurse practitioner (NP) and nursing handoffs.

METHODS

This research focused on the question as the unit of analysis. To identify and categorise questions posed during face-to-face handoffs, we video and/or audio recorded nursing, NP and resident physician handoffs. Although some comparison between these clinician types was possible and is included in this paper, the differences or similarities of the groups was not emphasised during the analysis of the data and the groups were selected by convenience to capture question opportunities. Participating clinician types are not balanced in numbers or clinical focus.

Sample

Participants were internal medicine and surgical residents, bedside nurses and NPs. Residents were completing a month-long rotation on two general internal medicine wards or a surgical intensive care unit in a Midwestern VA Medical Center. Each month, 15 eligible residents are on service on the medicine wards and 7 eligible residents are on service in the surgical unit. The total census capacity for medicine patients was 54 while the surgical ward census capacity was 21. Five general internal medicine teaching teams covered the medicine wards, and residents were assigned patients on a rotating basis as admissions occurred. We were unaware of any formal training for VA nurses in end of shift handoffs, and residents at the School of Medicine rotate through four hospitals that use three different electronic health record systems and employ handoff processes and training that are highly variable from one to the next.[27] Nurses and NPs were drawn from the same units. Inpatient nursing shifts changed every 8 h, with some variation for nurses who work 12 h shifts. Because there are variations in how handoffs are conducted from shift to shift, as well as from service to service, we sampled all shifts on two different general medicine wards and the surgical service to achieve optimal variation. There were 62 eligible nurses on the medicine wards, 46 eligible nurses on the surgical unit and 4 eligible NPs on the surgical intensive care unit.

Procedure

The Internal Medicine Residency Program Director and VA Chief Resident helped us identify participants

from the medicine service; similarly, the Chairman of Surgery at the School of Medicine, VA Chief of General Surgery and Surgical Chief Resident helped us identify surgical residents to participate in the study. Nurses and NPs were recruited directly by study research assistants (RAs) after the Associate Medical Center Director for Patient Care Services contacted the manager and charge nurses about the study.

Once participants were identified, an RA approached a potential participant (incoming and outgoing residents, nurses and NPs) to explain the study procedures, answer any questions and obtain consent for enrolment in the study. Twenty nurse dyads gave their permission for their handoffs to be audio-recorded, whereas seven nurse dyads and all resident dyads (n=13) and intern dyads (n=5) gave their permission to be both audio-recorded and video-recorded. Because relatively few nurse dyads agreed to be videotaped, we decided to base our analysis on audio recordings alone. Analysis of non-verbal aspects of the videotaped handoffs has been published elsewhere; analysis of the use of questions in our more limited sample will be the topic of a subsequent paper.[28] The audio portions of the handoffs were transcribed verbatim and checked for accuracy. Data collection took place from February to December 2010.

Ethics approval was obtained from the University Institutional Review Board and Veterans Affairs Medical Center R&D Human Subjects board prior to recruitment for this study (IIR 07-241-2).

Data analysis

Transcripts were reviewed for questions posed by either the incoming or the outgoing professional during handoffs. We used a broad definition of questions as 'a sentence, phrase, or word that asks for information or is used to test someone's knowledge, or doubt or uncertainty about something'.[29] Questions were first identified during the transcription process through intonation, verbal cues and syntax. Transcripts were independently reviewed by two of the researchers. Each question was then extracted into an Excel spreadsheet with preceding and subsequent comments included for context. The same two researchers independently coded the questions and then met to achieve consensus about the coding. Coder consensus was achieved in all cases. Overall, 517 questions were identified. Although a few did not contain any questions (N=13), including one dyad that transferred two patients without questions being asked, the vast majority did. Using an inductive approach, the first 112 questions (22%) were coded by a team of four researchers in a series of biweekly meetings. Questions could receive more than one code and multiple codes were weighted equally. Using a consensus-building approach and multiple reviews of segments containing questions, we identified six coding categories. Two of the six categories were excluded because they occurred in such small numbers (3% or less). The remaining four categories related to (1) confirming patient status, response or treatment; (2) planning tasks, workflow and timing for the upcoming shift; (3) reaching consensus about clinical reasoning; and (4) framing and alignment of the handoff. Ten questions were judged uncodable (less than 1%), leaving a final sample of 507. Because questions could be assigned more than one code, percentages falling into each category overlap and total more than 100%.

RESULTS

The number of questions asked per patient during handoff ranged from 0 to 13, with the number of questions per patient across all handoffs averaging slightly over 3.5. There was some variation by profession in the number of questions asked per patient. Physicians asked 2.8 questions per patient; NPs asked approximately four questions, and bedside nurses asked 4.25 questions per patient. NP handoffs included the highest number of patients being transferred compared with nurse and physician handoffs (see table 1).

More questions were asked by Incomings (N=461) as compared with Outgoings (N=46), a ratio of nearly 10:1. Almost three quarters (72%) of Incomings' questions focused on workflow or handoff process issues, as discussed below.

Coding results

Confirming patient status, response or treatment

The main type of questions, asked exclusively by Incomings, related directly to understanding the patient. Approximately 47% of questions sought information about the patient's current condition and response to therapy or treatment. The questions covered the following topics: (1) current patient status and symptoms to manage; (2) patient diagnosis; and (3) psychosocial issues. Patients who were unknown or unfamiliar to the Incoming produced questions targeted for efficient assessment such as 'Is he diabetic?' (seeking information) 'So his chief complaint is fever?' (confirming information) or 'So our plan with him is…?' (summarising information). Similarly, to understand a patient's changes since she or he last provided care to that patient, Incomings asked questions such as 'Is his skin ok?', 'have his bowels moved?', 'is he off the vent?' and 'he's been stable through the night?' Some questions

Table 1 Total number of handoffs, patients and patients/handoff for nurses, nurse practitioners and physicians observed in this study

Provider type	Number of handoffs	Number of patients	Patients/handoff (approx.)
Nurses	25	196	8
Nurse practitioners	4	84	21
Physicians	21	166	8

sought further understanding of a previous statement's meaning, as is evidenced in the following exchange:

> Outgoing: No, he's assist, assist, assist.
>
> Incoming: Assist?
>
> Outgoing: You assist him uh to the wheelchair to go to the bathroom because he's not bearing any weight on that uh right knee, right leg right now. It is a non-weight bearing.

Planning tasks, workflow and timing

The second largest category of questions (approximately 38%) related to workflow and timing. These questions varied in the specific information requested and all focused on the Incomings' upcoming shift. While frequently requesting information and status updates, these questions included actions that were already planned and could be accomplished on the Incoming's shift. Questions in the workflow category included (1) the Outgoing's patient load and location of patients; (2) timing and dosing of medication; (3) scheduled patient care tasks (eg, timing for vitals check, diet restrictions, wound care); and (4) care coordination with other providers or other services.

All provider types asked questions essential to tasks involving others. For example, nurses inquired whether a patient would require constant monitoring or about the number of providers needed to assist patients out of bed or, as in the following discussion:

> Outgoing: He's on room air. He's oriented times three. He is up with assist.
>
> Incoming: How many people work?
>
> Outgoing: Huh?
>
> Incoming: Assist with one person?

Physicians and NPs sought details on coordinating patient care with other services, as illustrated by these exchanges between an NP and a physician dyad (respectively):

> Outgoing: Um he has a rectal bag on. Um didn't have a large amount of stool um, I think kind of passing gas and having small amounts of liquid stool, which ah c. diff has been negative on that. Um let's see, I think his wife and ah stepson are bedside. I'll go out and talk to them after we get done.
>
> Incoming: So Plastics coming just to do the Fentanyl for the dressing change?
>
> Outgoing: Yes.
> Incoming: Who is on call for the vascular guy?
>
> Outgoing: (NAME)

Consensus about clinical reasoning

Sixty questions (approximately 12%) sought information about the clinical reasoning or rationale behind a patient's care plan. Questions in this category were divided into two subtypes. The first sought an explanation for the patient's care plan. For example, following the Outgoing's statement, 'He will be NPO at midnight', the Incoming asked: 'Do we know why?' The Incoming's question is neutral, suggesting that she may simply be gathering data or preparing to answer if the patient asks why he cannot have food or drink on her shift.

The second subtype in this category appears to be a form of hypothesis testing. Questions in this subcategory conveyed more uncertainty, or even scepticism about the patient's condition or care plan, such as the following exchanges from two separate nurse handoffs.

> Outgoing: At 100.
>
> Incoming: Okay. That's a little strange ain't it?
>
> Outgoing: His blood pressure is quite low. Ah he's been running 80s to low 90s.
>
> Incoming: They're okay with that?

Physicians also engaged in hypothesis testing in their handoff exchanges, as in the following:

> Outgoing: … because he um on anesthesia you know so um we are not sure actually he defervesced spontaneously this morning as well so I don't think he is infected.
>
> Incoming: Are you doing anything for that fever?
>
> Outgoing: Um actually nothing he defervesced so we didn't do anything for him um we.
>
> Incoming: No culture, nothing?

In these two exchanges, the Incoming seeks a rationale for both the information provided and for the patient's care plan. These questions seek the Outgoing's response to, or consensus about, the Incoming's concern(s).

Framing and alignment

Fifty-nine questions (11%) related to the mechanics of the handoff. These questions were used to begin or end the discussion of a patient or to reorient the Incoming and the Outgoing after an interruption or point of confusion. With the exception of questions by Incomings to make sure they were aligned with the information being shared, these questions were all asked by the Outgoings and included queries such as 'Okay so you've got 60 bed 2, is that right?' (confirming that the patient who is about to be handed off is under the care of the correct Incoming), 'Ready for Mr G?' (testing the Incomings readiness to receive a new patient) and 'What else do you want to know?' (inquiring about the adequacy of the information provided to the Incoming about a specific patient). Questions related to alignment with the pace of the handoff were most often initiated by Incomings.

For example, when confused about which patient was being discussed after a burst of information about a catheter, the Incoming asked: "Okay, which one is this?" Pacing alignment was also sought when the Outgoing presented complex patient care information. In the following example, the Incoming's questions were used to dissect the details of the communication exchange and confirm them individually, regulating the pace of the exchange:

> Outgoing: Y- yes 8:00 p.m. to 8:00 a.m. That's the 100 mils an hour for one hour, then 240×te- ten hours. Then the last hour at 100.
>
> Incoming: Okay so wait a minute. Do-do-do-do-doooooooo. Times one hour?
>
> Outgoing: Times one. [Pause] Then it runs 240 times ten. [Pause] And then back to one hour?
>
> Incoming: At 100.

One example of an unusually proactive Incoming accomplishing multiple handoff functions occurred with the question: 'Yeah, anybody on this list that you are more worried about or ..?'

Another alignment phenomenon was the use of questions to communicate familiarity with the patient being handed off rather than being used as requests for information. Questions of this sort signalled that one or more aspects of the patient's care were already known to the Incoming. The question particle 'still?' was frequently used after an Outgoing's description of a patient's status or treatment(s) to indicate familiarity with the patient and their clinical course. Eighteen questions receiving this code signalling prior knowledge or experience with the patient, included 'still' in the question, as in the following example:

> Outgoing: Uh, yeah, yeah. Uh, like I said contact for MRSA –
>
> Incoming: Um hmm still huh?

Distribution of questions by provider type

The distribution of question types among the three provider groups was fairly uniform with one exception. Although nurses typically asked about half of all the questions in each category, nurses' total number of questions dropped to 26% for questions seeking consensus about clinical reasoning. There were fewer NP handoffs in the sample and this may account for the smaller percentages under each question type. Additional research in larger samples will be necessary to determine whether there are absolute differences in question types by provider role (table 2).

Table 2 Percentage distribution of question type by provider group

Provider type	Confirming patient status, response or treatment (%)	Planning tasks, workflow, timing (%)	Consensus about clinical reasoning (%)	Framing and alignment (%)
Nurses	49	47	26	58
Physicians	34	34	41	27
NPs	17	19	33	15
Total	100	100	100	100

NPs, nurse practitioners.

DISCUSSION

The purpose of our study was to describe the functions of questions that were asked during handoffs enacted by medicine and surgery residents, inpatient care nurses and NPs. Our analysis revealed that the vast majority of questions were asked by Incomings which makes intuitive sense given the fact that they need to have the information at hand to plan and act once the handoff is completed. At the same time, it is unclear whether the questions that were asked represented 'missing' or incomplete information that the Outgoing could have, and perhaps should have, shared. As well, despite requirements for Outgoings to provide explicit opportunities for Incomings to ask questions, there were only a few instances in which this opportunity was offered. Nonetheless, except for one handoff in the entire corpus, Incomings of all professional backgrounds asked questions. To the extent that (substantive) questions can be considered a measure of engagement, our findings suggest that questions play a significant role in co-constructing the course, direction and outcome of handoff interactions. In a traditional handoff scenario, the Outgoing directs the process by sharing information needed to care for patients during the upcoming shift. Questions that Incomings pose to Outgoings 'interactionalise' the exchange and make it more conversation-like than monologic. The fact that Incomings asked 10 times the number of questions as Outgoings suggests that patient handoffs are dynamic and emergent rather than a unilateral flow of information. While the preponderance of questions from Incomings could signal a need for better standardisation, many of the questions were improvisational and specific to the two (or more) handoff participants or other unique factors. In the first examples (above) of confirming patient status and planning tasks, workflow and timing, the Incomings and Outgoings did not share the same ability to shorthand their exchange around the term 'assist', and questions emerged spontaneously as a result. Similarly, consensus about clinical reasoning questions such as, 'They're okay with that?' emerged spontaneously when an individual Incoming felt uncomfortable about the information being offered by the Outgoing.

Nearly half the questions asked by Incomings dealt with confirming patient status. The range of questions varied, but they represented what Incomings considered

important for providing patient care. Considering the tremendous variation in patient needs and treatment, it is unsurprising that Incomings' questions addressed patient diagnoses, status, symptoms to manage and psychosocial issues. These questions sought the Outgoing's perception of pertinent granular detail about individual patients.

Also, Incomings frequently asked questions related to workflow and timing. These types of questions help Incomings organise the work of the upcoming shift, a primary goal of handoffs. Seeking the specific information to plan shift work is a form of 'stacking', the cognitive acquisition and prioritisation of patient care tasks.[30] Incomings sought to 'stack' their own patient care tasks and those that required the assistance of other providers or specialties and the necessary sequencing of this collaborative care. With these two questions types, Incomings strategically sought the information that would best help them understand individual patient conditions and plan accordingly.

Other functions played by Incomings' questions, while less frequent than confirming patients' status and organising workflow, are important to note. Seeking consensus on clinical reasoning, for example, is an important component of patient safety. Medication errors, wrong site surgery, misdiagnosis and other care planning errors can be reduced if healthcare professionals speak up, or in this case, ask questions about the rationale for current and planned patient care.[31] Likewise, framing and alignment of information flow is critical to maintaining accuracy.

Although previous literature suggests that Incomings may be too passive or even inadequate in their questioning,[2 32] those we observed were active and engaged with some variation in the number and type of questions asked by each professional group. We have observed anecdotally that physicians and NPs for the most part are in the business of 'managing' the clinical course of patients' medical diagnoses while bedside nurses are responsible for managing patients' physical and psychosocial responses. It is possible that the greater frequency of questions by nurses relates to the number and types of tasks they are responsible for during any given shift as compared with the management decisions physicians and NPs make during the same period of time.

LIMITATIONS OF THE STUDY

This was a single-site qualitative study which limits the generalisability of our results. It is possible at different VA sites and services that the number, types and functions of questions would vary. On the other hand, our data were collected across a number of different shifts and on two major services, medicine and surgery at a large, diverse VA facility which ensured maximum variation for the site we studied. A second limitation of the study is a possible bias introduced by the videotaping procedure. It is possible that nurses and physicians who know that their handoffs were being videotaped changed their behaviour from when they were not being taped. Studies of audio and videotaped physician–patient interaction have shown that although there may be an initial orientation to the camera this quickly disappears and is replaced by 'normal' behaviour.[33 34] Finally, our selection of participants for the study may involve a self-selection bias. Having one's day to day work scrutinised may lead some to decline participation while for others it may be an opportunity for contributing to improving the handoff process. We acknowledge that selection bias may be a possibility but would argue, as with any early scientific investigation, that detailed recordings of even a self-selected group of handoffs offers a unique window into a phenomenon that is still not well understood.

CONCLUSIONS

End of shift handoffs continue to be a vulnerable part of our healthcare system, posing challenges and opportunities for research and interventions that will bring about lasting improvement. In any system in which language is the medium of exchange, there are bound to be ambiguities and uncertainties. Some industries, like aviation with the use of teach-backs, talkbacks and checklists[35 36] and nuclear power with its use of SBAR,[37] have developed systems for standardising communication, especially across authority gradients. Unlike situations in which an inherent authority gradient exists, end of shift handoffs largely take place among peers. While standardised tools undoubtedly have value, using them to constrain the language of a handoff may miss the mark by unnecessarily overriding the subtleties of social interaction which play an important role in *how* as well as what information is shared.

Understanding handoffs as complex interactional achievements operating at multiple levels of self-awareness and situational awareness, communication (verbal, non-verbal, electronic) and relationships (from being strangers to being well-known to one another) embraces the notion that these events cannot be understood simply as mechanical transfers of information from a sender (Outgoing) to a receiver (Incoming).[38] As our data demonstrate, some questions emerge in handoffs in non-linear and improvised ways. An ideal approach to improving handoffs would be to recognise and embrace the fact that in addition to reducing some forms of variation using standardised tools or checklists, human enterprises such as handoffs always carry the potential for novelty and spontaneity.[6] Studying the different forms, functions and placement of questions during handoffs provides an initial insight into designing improvement interventions that take into account technical information and social context in equal measure.

Author affiliations
[1]Indiana University School of Medicine, Indianapolis, Indiana, USA
[2]Richard M. Fairbanks School of Public Health, Indianapolis, Indiana, USA
[3]Richard L. Roudebush VA Medical Center, Indianapolis, Indiana, USA
[4]VA HSR&D Center for the Study of Healthcare Innovation, Implementation and Policy, VA Greater Los Angeles Healthcare System, Los Angeles, California, USA
[5]Indiana University School of Nursing, Indianapolis, Indiana, USA
[6]Mary Margaret Walther Center for Research and Education in Palliative Care, Indianapolis, Indiana, USA

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