Lost in Translation: Challenges and Opportunities in Physician-to-Physician Communication During Patient Handoffs

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Abstract

Handoffs involve the transfer of rights, duties, and obligations from one person or team to another. In many high-precision, high-risk contexts such as a relay race or handling air traffic, handoff skills are practiced repetitively to optimize precision and anticipate errors. In medicine, wide variation exists in handoffs of hospitalized patients from one physician or team to another. Effective information transfer requires a solid foundation in communication skills. While these skills have received much attention in the medical literature, scholarship has focused on physician-to-patient, not physician-to-physician, communication. Little formal attention or education is available to reinforce this vital link in the continuity of patient care.

The authors reviewed the literature on patient handoffs and evaluated the patient handoff process at Indiana University School of Medicine's internal medicine residency. House officers there rotate through four hospitals with three different computer systems. Two of the hospitals employ a computer-assisted patient handoff system; the other two utilize the standard pen-to-paper method. Considerable variation was observed in the quality and content of handoffs across these settings. Four major barriers to effective handoffs were identified: (1) the physical setting, (2) the social setting, (3) language barriers, and 4) communication barriers.

The authors conclude that irrespective of local context, precise, unambiguous, face-to-face communication is the best way to ensure effective handoffs of hospitalized patients. They also maintain that the handoff process must be standardized and that students and residents must be taught the most effective, safe, satisfying, and efficient ways to perform handoffs.

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A *handoff* is defined as the transfer of role and responsibility from one person to another in a physical or mental process. Highly visible handoffs, such as those that take place in sports, typically involve precision and risk. In a relay race, for example, precious hundredths of a second in the handoff can make the difference between winning or losing a race, not to mention the risk involved if the baton is juggled or dropped. In aviation, the handoff of an aircraft from one air traffic controller to another involves precise moment-by-moment communication between the air traffic controllers involved and the crew members responsible for flying an aircraft. In both cases, members of the teams practice and are observed using the skills involved in the handoff multiple times to improve efficiency and reduce the likelihood of error. In light of the obvious importance of the handoff in many fields it is nothing short of astonishing that so little formal attention has been paid to the handoff of patients from one individual or team of physicians to another. In this article we examine some general principles and pitfalls observed in physician-to-physician communication, describe current patient handoff practices in one complex medical system (Indiana University School of Medicine), discuss communication barriers, and offer recommendations for improvement in the patient handoff process.

To inform our discussion, we performed a comprehensive search of the literature using Medline's OVID database and PsychInfo, entering the following three search terms: *interprofessional relations*, *physicians,* and *communication*. These results were then combined with subject headings from aviation and aerospace medicine. We also searched the Web sites of OVID, PsychInfo, and the Agency for Health care Research and Quality (AHRQ) using the search terms *changeover, handoff, signout*, and *handover.*

Background

According to estimates from the Institute of Medicine, 44,000 to 98,000 patients die in U.S. hospitals annually because of injuries in their care due to errors.[1] The nature of these errors runs the gamut from gross incompetence to seemingly trivial lapses in communication. Breakdowns in communication, whether person-to-person or person-to-machine, often result in errors, many of which are preventable. An Australian study involving 28 hospitals reviewed the

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causes of adverse events and found that communication errors were the leading underlying cause, associated with twice as many deaths as was clinical inadequacy.[2]

Various factors associated with communication errors have been identified. For example, the shift in the medical community toward increased utilization of hospitalists (i.e., doctors who work in the hospital setting exclusively) has made the care process more complex. In contrast with the traditional paradigm in which a primary care physician continues to see his or her patients when they are hospitalized, multiple physicians may now share in the care of a single patient. In addition, recent duty-hour rules mandated by the Accreditation Council of Graduate Medical Education (ACGME)[3] may contribute to the problem by fragmenting care in teaching hospitals and increasing the number of times a patient's care is transferred during a hospital stay. These factors in turn increase the chances of error due to miscommunication.

Discontinuity of care in the hospital setting is practically unavoidable unless the physician is in the hospital 24 hours a day, seven days a week. And as Vidyarthi correctly points out, hours worked and numbers of patient handoffs are inversely related, significantly increasing fragmentation of care.[4] A single patient has the potential of being "changed over" several times in a 24-hour period, and the more often information is transmitted or communicated, the more likely it is that there will be distortion or corruption of the original data. Volpp and Grande have observed that even though the handoff of patients is critical, it is often done in a haphazard fashion, and the extent of the information transmitted to the on-call physician varies considerably.[5]

The child's game "telephone" is a good illustration of this phenomenon. The first person in the game whispers a sentence or paragraph to the person sitting next to them, who in turn whispers it to the next person and so on until the message has been communicated to all players. The last person then repeats what he or she heard and it is compared with what the first person said. The fact that there are no checks or balances on what was said as the information is transferred from person to person often leads to significant transformations and distortions of the original message. In the game the results are often amusing; in medicine they are not. For example, patients who are admitted by a cross-covering resident and then transferred to a different resident the following day will have more hospital tests and a longer hospital stay compared with patients whose care is continuous.[6] Standardization of information transfer can help reduce and possibly eliminate this problem. In the absence of a standardized method of preparing and performing a changeover, variability at the individual, team, and organizational level is possible, leading to unwanted variation in the changeover process and outcomes.

The importance of employing a standard changeover format is underscored in many large teaching institutions. For example, Indiana University School of Medicine currently has four different teaching hospitals that utilize three different computer systems, and multiple users who hand off patients from multiple specialties. There is limited guidance from the medical literature in how to manage such complexity, which is another reason to identify successful practices that can be implemented across hospitals and programs. One exception involves a number of recent publications from the AHRQ's Morbidity and Mortality Rounds Web site that have highlighted significant medical errors resulting from poor team communication.[4,7,8] Such events are instructive because they provide insight into the routine pathways that harmful and nonharmful errors share and illustrate the importance of understanding the background conditions and rituals that can lead to error.[9]

How physicians communicate with their patients is another process that is extremely important to understand. There are numerous analyses of this process, which range from discussions of language barriers[10,11] to inefficiencies in delivering basic information regarding complex diseases such as HIV/AIDS.[12] There is a paucity of data in the medical literature on physician-to-physician communication. Giving and receiving information are a large part of the physician's everyday routine[13] as is interacting with computers and other diagnostic and decision aids.[14] Some practitioners are superb at all forms of communication, while others are uncomfortable around both computers and people.[15,16] All physicians should be able to demonstrate minimal competency in communication in order to practice medicine in general and especially to perform handoffs.

Current Handoff Practices in One Residency Program

The internal medicine residency program at the Indiana University School of Medicine utilizes four hospitals, each with a unique patient population; three different computer systems store and process data related to their care, including handoffs. The handoff process takes a different form at each hospital.

- The community hospital uses a handoff form as part of its computer system. Electronic information is printed for every patient and records patient name, record number, age, race, location, code status, admitting diagnosis, problem list (current and historical), allergies, and active medications. Additional space is provided for handwritten comments.
- At the Department of Veterans Affairs Medical Center, a computerized handoff form can also be generated, and records patient name, age, sex, Social Security number, location, team assignment, allergies, and active medications, and has additional space for comments.
- At the university hospital there are medical subspecialties, and each subspecialty utilizes a word-processing template for handoffs. A set of standard instructions is at the top of the form for commonly encountered issues related to each subspecialty. The handoff resident enters the identifying patient information with a medication list, problem list, active issues, and suggestions for potential problems that may be encountered overnight.
- At the private hospital, residents rotate on the cardiology and internal medicine services and document their own handoffs, either in handwritten form or with the use of a word-processor. The perceived quality and usefulness of this written handoff can be quite variable among the residents.
- Other institutions in the metropolitan area utilize personal digital assistants to document handoffs.

We have observed a great deal of variability in the preparation, content, and method of handoffs across the four hospitals that residents staff. The two most critical categories of information are the patient's reason for admission and the active problems with suggested therapies in the event that complications should arise. The details listed when documenting a handoff may range from a single fragmented statement such as "50ish yo M with COPD – stable," to information about a complete history and physical exam.

Residents are paged when it is time for the handoff to occur, and they meet at an agreed-upon location for a physical and verbal handoff of information on each patient. Occasionally, a resident may not be readily available because of a lecture, procedure in progress etc., and the handoff information may be left at a designated location without any opportunity for verbal exchange.

Barriers, Other Issues, and Recommendations

Barriers

We outline below four major barriers in the handoff process.

The physical setting. The physical setting, or environment, in which the handoff takes place is crucial. Patient confidentiality concerns dictate that handoffs be done in a setting that is private. Also, the setting should be reasonably quiet: background noise from televisions, other staff, and patients can be a barrier to the transfer of information. In short, the complexity of cases and attention needed to ensure a smooth transfer require a physical location that reduces potential interruptions and background noise. Appropriate lighting should be available along with ample writing space to take notes.

The social setting. The social setting is also important so that both parties involved in the exchange can feel comfortable discussing treatment options. Sutcliffe et al. suggest that communication failures often arise from status differences as well as concerns with hierarchy and with interpersonal power and conflict.[17] In medical education, the interchanges between residents and attending physicians, fellows, residents from other specialties, and other professional staff such as nurses each have a high potential for reinforcing differences in status and power of those involved in handoffs.

Language barriers. Language studies have suggested that racial and ethnic minorities and persons with limited English proficiency face barriers to care[18] even when translators are available. While physicians speak a common "medical language," a great deal can be lost in the transfer of information between physicians of different ethnic backgrounds and those from different geographic regions of the same country. Language barriers among physicians whose first language is not English are much more common today with the large number of international medical graduates who train and practice in the United States. As such, colloquialisms should be avoided and only accepted abbreviations should be used in both the written and oral presentation.

Using linguistic checks and balances even among medical teams that know one another well is also important to ensure accuracy. Repeating a verbal order such as "Administer two units of regular insulin IV hourly" by stating "Administer two units of regular insulin by intravenous push every 60 minutes" is one linguistic method of ensuring that one has heard and understood the order. It also allows the speaker to self-correct (e.g., "I actually meant administer regular insulin by continuous intravenous infusion at a rate of 2 units hourly").

Medium of communication. Finally, the medium of communication can be an important barrier. One useful distinction to make is between mediated (indirect) and nonmediated (direct) forms of communication. When a physician and patient or teams of physicians are together in one another's presence, the communication is direct. The full range of communication channels—including facial expression, posture, gesture, smell, proximity, and eye contact—is available to participants to help interpret and "make sense" of the information being exchanged.[19] By contrast, communication by telephone, e-mail, paper, and computerized records is mediated. In this type of communication the number of information channels is reduced and many more assumptions about the intent and motivation of the producer of the information must be made.

Given its immediacy and potential for reducing the number of unconfirmed assumptions, we argue that direct communication is almost always preferred to mediated communication in terms of patient handoffs. Thus, we recommend that verbal and written communication occur together, as this combination provides multiple channels for the information to be exchanged. Verbal cues can also raise the index of concern about the level of care a patient is receiving. A sleeping resident may be more apt to awaken and get out of bed to fully assess the patient in person on the basis of having discussed the case verbally. For this reason face-to-face handoffs are preferable, since body language and facial expressions also provide additional information about the level of concern regarding a patient's medical problems. In some cases, for example, where the patient's condition is particularly tenuous the handoff should be done at the bedside.

In practice, primary care physicians and specialists frequently communicate in writing only. Written communication is asynchronous and often leaves ambiguities and unanswered questions that cannot be pursued easily.[20] Similar problems exist for specialists, who often receive one-line requests from primary care physicians that must be interpreted with respect to their intent. Performing the handoff in person allows for a more effective exchange of information and a better opportunity to ask questions about the handoff.

Time and convenience issues

The handoff process can be time-consuming and inconvenient both in preparation and execution. In previously published data, Solet et al. found considerable variability in the content of the information being changed over, and residents commented that the amount of time required to prepare and execute the handoff directly influenced its content.[21] The data also showed that the amount of time used to prepare and execute the handoff varied by the type of service being covered (general medicine ward vs. intensive care unit), and that the average time was 18.7 minutes.

At the University of Washington, Van Eaton and colleagues performed a randomized controlled trial to evaluate the impact of a computerized rounding and sign-out system on continuity of care and resident work hours.[22] They had participation from 14 inpatient resident teams from surgery and internal medicine at two teaching hospitals over a five-month period. Data collected included number of patients missed on resident rounds, subjective continuity of care quality and workflow efficiency, and daily self-reported prerounding and rounding times and tasks. Their system enhanced patient care by decreasing patients missed on resident rounds and improving resident-reported quality of sign-out and continuity of care. The computerized rounding and sign-out system decreased by up to three hours per week (range 1.5 to 3) the time used by residents to complete rounds, as it diverted prerounding time from recopying data to more productive tasks. It also facilitated meeting the 80-hour duty week requirement by helping residents finish their work sooner.

Education issues

Lack of standard educational practices in the area of patient handoffs adds to the degree of variability in conducting the handoff. Data that we previously reported[21] from an electronic survey of the internal medicine subinternship clerkship directors of 125 U.S. medical schools revealed that *only 8% of medical schools teach how to hand off patients in a formal didactic session*. The vast majority (86%) of medical students are taught by interns or residents who were likely taught by their interns or residents and so on.[21] This process exemplifies the hidden or informal curriculum in medicine where a task is learned by observing those in charge of performing the task.[23] Despite having a response rate of 50% on the survey, it suggests that there are a considerable number of medical schools where a formal curriculum is not in place to teach subinterns in internal medicine how to prepare and execute the handoffs of their patients.

Recommendations

In our survey of staff and residents referred to above[21] we asked what information was necessary for effective handoffs. All respondents agreed on some issues, including identifying information, current medical issues, and pending tests. However, only 71% of respondents included significant test results, 41% included code status, 35% included effective interventions for prior events, and only 29% included disposition as an important detail.

In the absence of an established curriculum on how to teach physicians the handoff process, we propose a model based on principles of adult learning and clinical experience.

1. In the first month of internship, trainees would have a lecture on how to provide effective handoffs of their patients. The lecture would be interactive and begin with questions that explore trainees' thinking about handoffs and the information, policies, and procedures that should be included in them. Trainees would then be paired off and asked to role-play, handing off sample patients to one another. A discussion session would follow the handoffs of each other's patient. This exercise would then be followed by an attending physician's discussion of the sample patient.
2. The attending physician would model an established handoff. The established handoff should be formalized and have been accepted by the majority of attending physicians in the department of medicine. *Furthermore, the curriculum would emphasize an attitudinal shift from the concept of "sign-out" or "babysitting overnight" to an assumption of primary care responsibilities for that patient in the absence of the primary care team.*
3. After the first month in which an intern has been directly involved in handoffs, small groups would meet again to repeat the procedure outlined in item 1 above. During the follow-up meeting, problems encountered in the previous month could be discussed and new questions could be raised.

We believe that many of the problems cited above could be corrected by introducing a standardized method for patient handoffs. Computerized medical records can facilitate handoffs if a word processor with copy and paste functions is available or if a handoff software package is available. We suggest that institutions develop such handoff packages as part of their information technology infrastructure. While there is considerable variability in what physicians perceive as required data for a patient handoff, we propose that the items shown in List 1 are essential.

List 1

Essential Elements for Successful Handoffs

1. Each physician team should be assigned a distinctive name and color.
2. List all staff names and other team members with pager numbers, including covering attending physicians if applicable.
3. Include complete patient identification (full name, age, sex, race, location, Social Security number or hospital number), date of admission, and location. At least two forms of identification should be listed to avoid mistakes of patient identity in case a procedure needs to be performed while on-call.
2. Add a one-or-two-sentence assessment of the patient's presentation.
3. Include an active problem list plus a pertinent past medical history.
4. List all active medications.
5. List allergies.
6. Supply information on venous instrumentation and access, status of access, and any actions to be taken if access changes.
7. Include the patient's code status.
8. Include *pertinen*t laboratory data.
9. List your concerns for the next 18-24 hours and a recommended course of action. For the intensive care unit, use a system-based approach. For the general medical wards, use a problem-based approach.
10. Consider listing the long-term plans, as family may visit in the evening during off-hours to discuss this issue with covering housestaff.
11. Discuss any psychosocial concerns that may influence therapeutic choices.

Discussion

Although the myth of modern medicine emphasizes its perfection, the reality is that it is an error-ridden activity. Moreover, poor communication in medical practice turns out to be one of the most common causes of error. Addressing the barriers to effective

physician-to-physician communication with an emphasis on standardizing the patient handoff process and teaching senior medical students and residents the proper handoff methods, may be one way to reduce errors.

While medicine is in some ways unique, there are other professions and industries where error-free operation is a high priority and where systems thinking has led to improved performance outcomes. In this regard it is instructive to consider the changes that have taken place in aviation during the past two decades. During that time the aviation industry has decreased errors caused by human factors by 50% to 81% through safety training and standardization.[24] One example is communication between the cockpit and ground personnel as well as among crewmembers themselves. Kanki et al. examined the relationship between communication patterns and performance in ten 2-person flight crews with the aim of identifying speech variations as they relate to errors during flight simulations.[25] Marked homogeneity of speech patterns characterized low-error rate crews, while heterogeneous speech patterns characterized high-error crews. Because conventional forms of speech confirm the expectations of those involved, predictability of crewmember behavior is greater when standard conventions are followed. As a result, the practice of standardizing speech patterns was implemented to facilitate the coordination process and to enhance crew performance. In another study of cockpit crew communication, Frankel found that errors were related to interaction complexity in the cockpit.[26] The more verbal and physical tasks crewmembers participated in simultaneously, the greater the probability of errors occurring as crew members attempted to coordinate their actions. Taken together, these two studies suggest that consistency in language and focus are important to optimize performance in coordinating complex activities like flying an airplane and handing off a patient.

In addition to consistency of language, patterns of authority in communication can create barriers to effective coordination. For example, Milanovich et al. remark that one of the most troublesome dynamics evident in the airplane cockpit is communication between persons who are unequal in status (e.g., the captain and the flight engineer). Too often, captains fail to listen and flight engineers fail to speak.[27] The authors suggest that superordinate (supervisor) and subordinate behavior in the cockpit can be generalized to other contexts, such as medicine, in which there are status differences between the communicators. It has been observed that status differences in the operating room can create tensions in team communication that negatively affect surgical trainees, who generally respond by withdrawing from communicating or mimicking the senior staff surgeon.[28] These responses compromise team relations and the trainee's ability to effectively participate in the learning process.

In day-to-day practice, staff physicians will sometimes hand off patients to interns who are on call. Creating a context in which trainees of lower status are encouraged to question staff is critically important. In a recent survey of 1,033 doctors, nurses, fellows, and residents working in operating theatres and intensive care units[1] and over 30,000 cockpit crew members,[2] 70% said that it was appropriate for junior team members to question the decisions of senior team members.[29] However, there were clear differences in response rates based on position and discipline. For example, only 55% of consultant surgeons were likely to support flat hierarchies compared to 94% of cockpit crew members and intensive care staff.

In aviation, superiors are expected to address concerns raised by junior colleagues according to the "two-challenge rule." It states that a subordinate is empowered to take control if a pilot is clearly challenged twice about an unsafe situation during a flight without a satisfactory reply. Unfortunately, a challenge rule or similar mechanism is not present in the medical culture, as a hierarchy usually dictates who is qualified to raise specific issues, provided that the physician is not obviously impaired. Training methods for the handoff process in medicine will need to be designed to address this disparity between the cultures of aviation and medicine. Health care providers need explicit instruction in communication and teamwork rather than learning by trial and error, which often reinforces dysfunctional values, attitudes, and behaviors.

In this article, we have identified a number of barriers and issues concerning the current practice of patient handoffs and have proposed practical, timely solutions for addressing them. At Indiana University School of Medicine, senior medical students and residents are now being instructed on the proper method of handing off patients and the essential components of the handoff. We look forward to reporting the results of this intervention in a subsequent publication.

Recent duty-hour rules mandated by the ACGME will likely result in more handoffs because more medical professionals will be employed to share the workload by utilizing night floats, day floats, and hospitalist services. The quality of physician-to-physician interaction during handoffs will become even more important in providing continuity of care for hospitalized patients, who are sicker and require more complex treatment compared with such patients a decade ago. Can we afford to spend the time, effort, and dollars involved in additional training? We ask, can we afford not to? We believe that it is imperative to standardize the handoff process and to educate medical students and residents in the most effective ways to perform handoffs in ways that are safe, satisfying, and efficient.

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