



National Patient Safety Goals

A Model for Building a Standardized Hand-off Protocol

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In July 2003, the Accreditation Council for Graduate Medical Education (ACGME) set limits for resident duty hours.¹ Although the main driving force was to reduce sleep deprivation and improve patient safety, one unintended consequence was the increase in the number of handoffs during patient care. The discontinuity of care that thereby results has the potential to undermine the beneficial effects of work hour limitations.² The safety of the hand-off process has been called into question by a number of different sources and studies which suggest that handoffs are often characterized by communication failures and environmental barriers.³⁻⁶

The handoff is also the subject of a Joint Commission on Accreditation of Healthcare Organizations National Patient Safety Goal, which went into effect January 1, 2006. Written as a new requirement of Goal 2, Improve the Effectiveness of Communication Among Caregivers, this addition requires hospitals to implement a standardized approach to hand-off communications and provide an opportunity for staff to ask and respond to questions about a patient's care^{6,7} (Sidebar 1, page 647). Although the standard applies to all handoffs that occur between all personnel within all health care settings, the focus of this article is on the handoffs between residency trainees at academic teaching hospitals. Because medical trainees receive little to no formal training or education in communication during handoffs, there is an inherent opportunity to influence the practice of

Article-at-a-Glance

Background: The Joint Commission has made a "standardized approach to hand-off communications" a National Patient Safety Goal.

Method: An interactive 90-minute workshop (hand-off clinic) was developed in 2005 to (1) develop a standardized process for the handoff, (2) create a checklist of critical patient content, and (3) plan for dissemination and training.

Conclusion: To date, 7 of 10 residency programs have participated. Analysis of these protocols demonstrated that the hand-off process is highly variable and discipline-specific. Although all disciplines required a verbal handoff, because of competing demands, verbal communication did not always occur. In some cases, the transfer of professional responsibility was separated in time and space from the transfer of information. For example, in two cases, patient tasks were assigned to other team members to facilitate timely departure of a postcall resident (to meet resident duty-hour restrictions), but results were not formally communicated to anyone. The hand-off clinic facilitated the incorporation of "closed-loop" communication by requiring that follow-up on these tasks be conveyed to the on-call resident.

Discussion: This model for design and implementation can be applied to other health care settings.

Sidebar 1. Joint Commission National Patient Safety Goal 2: Improve the Effectiveness of Communication Among Caregivers

Requirement 2E

Implement a standardized approach to "hand-off" communications, including an opportunity to ask and respond to questions.

Rationale for Requirement 2E

The primary objective of a "hand off" is to provide accurate information about a patient's care, treatment, and services, current condition and any recent or anticipated changes. The information communicated during a hand off must be accurate in order to meet patient safety goals. In health care there are numerous types of patient hand offs, including but not limited to nursing shift changes, physicians transferring complete responsibility for a patient, physicians transferring on-call responsibility, temporary responsibility for staff leaving the unit for a short time, anesthesiologist report to post-anesthesia recovery room nurse, nursing and physician hand off from the emergency department to inpatient units, different hospitals, nursing homes and home health care, critical laboratory and radiology results sent to physician offices.

Implementation Expectations for Requirement 2E

1. The organization's process for effective "hand off" communication includes: Interactive communications allowing for the opportunity for questioning between the giver and receiver of patient information.
2. The organization's process for effective "hand off" communication includes: Up-to-date information regarding the patient's care, treatment and services, condition and any recent or anticipated changes.
3. The organization's process for effective "hand off" communication includes: A process for verification of the received information, including repeat-back or read-back, as appropriate.
4. The organization's process for effective "hand off" communication includes: An opportunity for the receiver of the hand off information to review relevant patient historical data, which may include previous care, treatment and services.
5. Interruptions during hand offs are limited to minimize the possibility that information would fail to be conveyed or would be forgotten

Source: Joint Commission on Accreditation of Healthcare Organizations: *2007 National Patient Safety Goals Hospital Version Manual Chapter, including Implementation Expectations*. http://www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals/07_hap_cah_npsgs.htm (last accessed Sep. 5, 2006).

future physicians.⁸ In addition, as academic teaching hospitals continue to adopt systems to ensure that duty-hour restrictions are met, an increased focus on the integrity of the handoffs is crucial to patient safety during these times of transition.

Although relatively little information about educational initiatives exist in the medical literature to guide resident and staff hospital physicians in meeting these standards, much can be learned from other high-risk industries that have been engaged in studying and improving handoffs. From direct observations at the National Aeronautics and Space Agency, nuclear power plants, and transportation dispatch centers, a framework of strategies for handoffs has emerged.⁹ Certain strategies, such as standardization and face-to-face verbal update with interactive questioning, resonate directly with the hand-off requirement and are supported by

evidence and expert opinion as best practices associated with improved hand-off communication.^{5,7,10} Drawing on this literature, as well as preliminary data, we present a model for building a standardized hand-off protocol to meet this National Patient Safety Goal. We also review our preliminary experience with the protocol at the University of Chicago.

Creating a Model for Standardized Handoffs

The handoff can be thought of as a communication of information (content) that can take place through different modalities, which can include a written or verbal component. Two guiding principles underlie this model. First, the standardized protocol for handoffs needs to be tailored to discipline and organization. That is, recognize that what works in one discipline may not work in

Table 1. Model for Adoption of a Standardized Handoff

1. Process
Create a process map.
2. Content
Create a standard check-list.
3. Implementation
Garner leadership and resident buy-in.
4. Monitoring
Ensure the protocol is in place and identify and resolve barriers.

another, given each discipline's unique requirements. Furthermore, what constitutes an effective handoff for one discipline may be different for the same discipline in another organization. Although certain components may be generalizable, the successful adoption of a standardized hand-off protocol is highly dependent on the degree to which it is tailored for end users in an organizational setting. It is the method by which you create the protocol—and the method that is presented here—that is generalizable across disciplines and organizations.

Second, standardization is the core goal for both hand-off process and content. For example, although an identifiable safe protocol may be currently in use for the majority of handoffs in a certain discipline and organization, it is the variability of the hand-off protocol that is the target for improvement. The four steps in our model are outlined in Table 1 (above) and discussed in detail below.

Develop a Standardized Process

“The first step is to draw a flow diagram. Then everyone understands what his job is. If people do not see the process, they cannot improve it.” — W.E. Deming

Understanding handoffs as a process is important because a high degree of process awareness often drives the design of the work. By mapping the process, the members of the team can gain insight into how their colleagues perceive the same tasks. Ultimately, systems improvement requires (1) appreciating the inherent link between process and results and (2) identifying potential areas for improvement with a focus on the system that is

producing the processes and outcomes of care¹¹ rather than on the individual.

Process mapping can be used to describe and analyze how an individual clinician interacts with the system as well as with others within that system. Process mapping describes what an individual is required to do, in terms of cognitive processes and/or actions to achieve the system's goal. It can be accomplished through observations and/or interviews that carefully break down the multiple steps in the process.

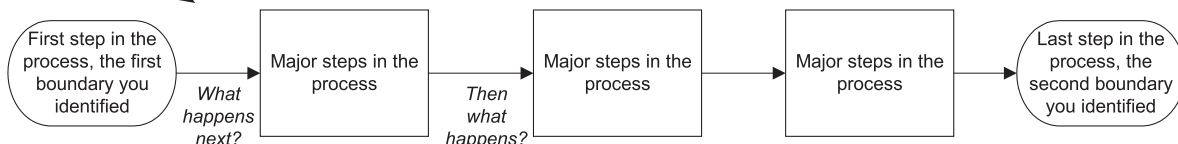
Process maps can be created at different levels of granularity, from a high-level overview of the major steps in the process to very detailed representation of each specific step or activity. Detailed process maps are especially helpful to standardize and improve processes. For use as an improvement tool, it is important to map the current process, not the desired process, so that opportunities for improvement can be identified. Being explicit about the processes can help clinicians shape what they know about their environment and to provide insight into how to improve the process or overcome some of the barriers.

Everyday, multiple types of handoffs occur in health care settings, such as handoffs around shift changes of nursing shifts, referrals to specialty care, and discharge from inpatient to outpatient care. We found it valuable to select only one type of handoff for the process analysis—the handoff from postcall residents to on-call residents. This transition represents the period of time that a patient is cared for by a “covering” resident who may be unfamiliar with the patient's hospital course, a known risk factor for preventable adverse events.¹² In addition, our earlier work suggested that this handoff was particularly vulnerable, with the implementation of recent ACGME duty-hour restrictions.⁵ The particular question that we posed to residents in the process mapping exercise was, “How does a postcall resident transfer the care of their patients to an oncoming resident?” We specifically asked how the content—the critical information required to care for patients during the coverage period—is transferred. We also asked residents to delineate the mechanism by which the oncoming resident formally accepts care of the patients (that is, the oncoming resident starts accepting calls from a “virtual pager” when they are on call, postcall

Process Map Tutorial

Steps for creating a process map:

1. Define the boundaries of the process. "This process begins with _____ and ends with _____"
2. The first boundary becomes the first step of your process
3. The last boundary is the last step of your process
4. List all the major steps that occur between



Some Reasons To Create a Process Map:

- ✓ Describe and document the process
- ✓ Generate with improvement ideas
- ✓ Determine best method
- ✓ Train others

Some Hints:

- ✓ Diagram the actual process—not what the process "should" be
- ✓ If you use "sticky notes" you can easily rearrange and add steps until you have a final draft

A key to the shapes used in flow charts:

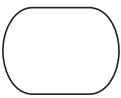
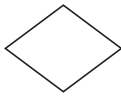


Ovals are beginnings and endings		Diamonds are questions or decision points	
Boxes are steps or activities		Arrows show sequence and chronology	

Figure 1. This process mapping tutorial was used during the hand-off clinic.

resident forwards their pager to the oncoming resident, and so on).

Figure 1 (above) includes a process mapping tutorial that was used during the hand-off clinic. Sample hand-off process maps for neurology and otolaryngology are included in Figure 2 (page 650) and Figure 3 (page 651), respectively. To analyze process maps, several questions are important to address to generate improvement ideas:

- What is the goal of the process?
- Does the process work as it should?
- Are there obvious redundancies or complexities?
- How different is the current process from the ideal process?

Although mapping the process is an important step in documenting the standardized protocol for handoffs, it can also be instrumental in educating new interns about the process. Furthermore, a process map can form the basis of the performance measurement tool to monitor and assess adherence to the process.

Build a Checklist of Necessary Content

In addition to developing a standardized process, it is equally important to determine the critical content to be transferred in a patient handoff.¹³ Omissions of content are a major cause of failed communication during handoffs.⁵ A checklist of necessary information can help teach others new to the handoff about the process and

Process Map for Neurology Standardized Handoff

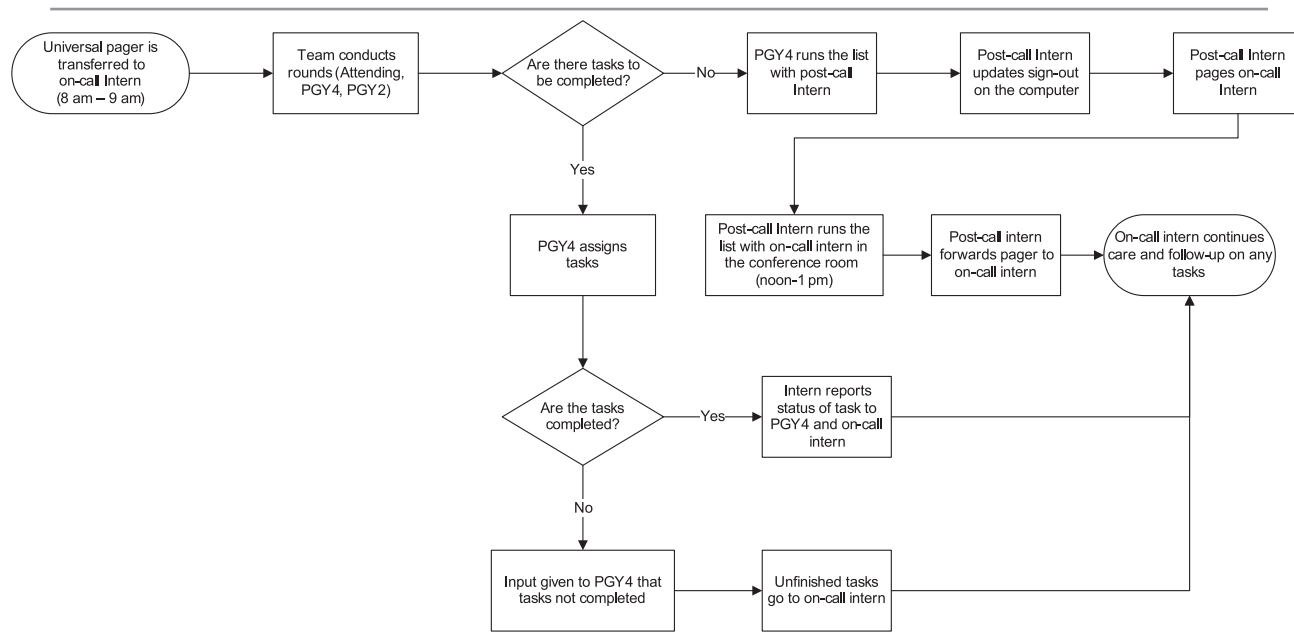


Figure 2. The hand-off process map for neurology is shown. PGY, postgraduate year.

serve as a monitoring tool in evaluating the content transferred. In designing a checklist, it is important to customize it for a specific discipline.

When thinking about what content to include in a checklist, one helpful tool is to interview the participants in the hand-off process regarding the information that they desire or need (Figure 4, page 652). A good starting point is to ask the following question: “What are the main content pieces of a handoff in your discipline?” The answers will likely result in a list of necessary patient content. A more detailed interview can elicit content that is part of an optimal handoff, in addition to content that may be omitted in a suboptimal handoff. To convert this content into a checklist, it is important to group this list into larger categories of content and smaller subcategories in each major category, as shown in the standardized content checklist for the pediatrics hand-off protocol (Figure 5 page 653). For example, administrative data or medications constitute large categories, whereas name, room number, and admitting team or service compose smaller subcategories under administrative data. Many programs may already use a template for written content, which may facilitate the creation of categories and subcategories of content. The checklist

will be perceived as more credible if it reflects technical jargon or refers to organizational or program-specific nomenclature used in daily patient care. For this reason, eliciting specific examples for how information is communicated during the interview is particularly helpful. Operator experience—the experience of those participating in the handoff—can influence the design of the checklist. For example, experienced physicians in hospital practice may not require the extensive checklist used by new interns. Finally, an acronym can serve as a reminder for critical content but also as a motivational tool to learn the new protocol.¹⁴ For example, the acronym we used for the checklist for psychiatry residents was “psychiatry”—representing *ps*ychiatric history; *s*pecial instructions; for *y*ou, for me (the to-do list); *c*ourt/legal issues; *h*ousing and social issues; *if/then*; *a*ddministrative data and allergies; *t*herapeutics; *r*esults of pertinent labs; and *r*adiology.

Discuss Implementation Strategies

An implementation plan begins with dissemination of both the process map and the checklist of necessary content. Using an opinion leader in a residency program, such as a chief resident or program director, can help facilitate

Process Map for Otolaryngology Standardized Handoff

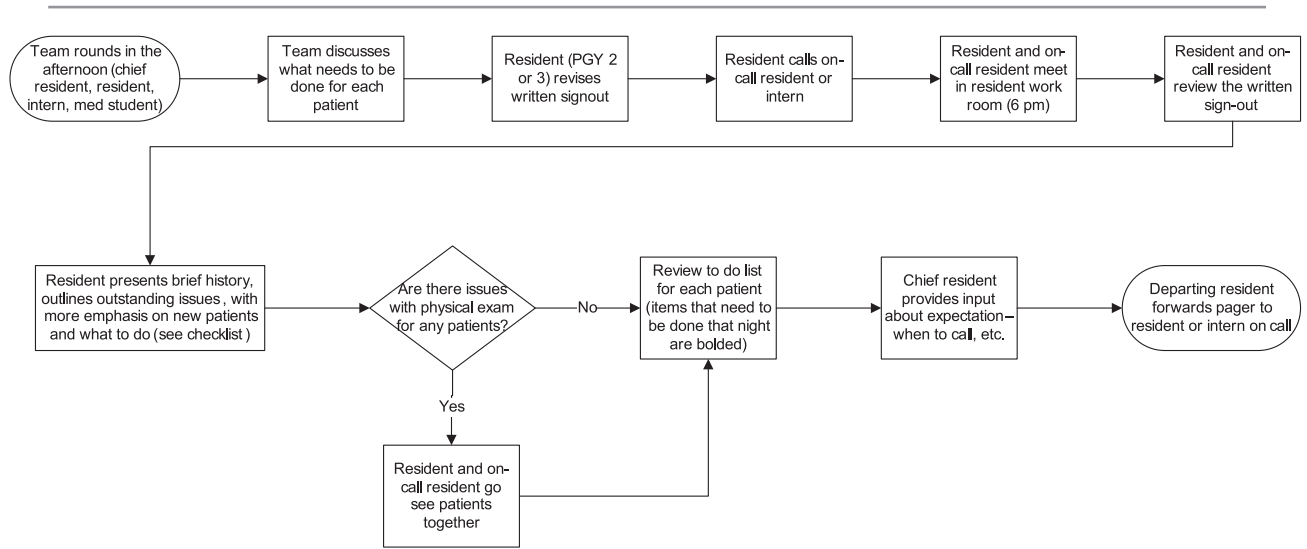


Figure 3. The hand-off process map for otolaryngology is shown. PGY, postgraduate year.

this process. During the dissemination phase, other resident physicians should be able to provide input into both the process and the checklist. The importance of producing tangible documents—that is, the process map and checklist—cannot be understated. These documents can be distributed for everyone’s input and clarification and can help facilitate input on the hand-off protocol. For example, are there other steps that are missing? Is the content checklist inclusive of the information needed? This input may dramatically improve the integrity and future buy-in of the standardized hand-off protocol.

Keeping a record of the input or suggested revisions and the response is important. Once a general consensus is reached, the process map and the checklist can be revised to incorporate suggested revisions. The new process map and checklist can then be distributed and used to educate students and residents on the handoff. These documents can also be particularly helpful when orienting new residents or students to the discipline.

Develop a Plan for Monitoring and Evaluation

To determine the success of implementing a standardized hand-off protocol, it is crucial that a plan for monitoring and evaluation be developed. Choosing an evaluation strategy can be challenging. The commonly accepted gold standard of patient outcomes may be

particularly costly and difficult to determine. More readily accessible measures such as stakeholder satisfaction and peer ratings of the quality of the hand-off process can also be considered. In addition, periodic reviews of the handoff content and process through direct observation can be performed using the process map and standardized checklist. Although direct observation may be subject to the Hawthorne effect, using a variety of strategies to evaluate handoffs will address this concern. For example, in retrospective interviews, participants are queried regarding the quality of the process and content of the handoff. In a recent study, critical incident analysis was used to ask residents if they had any difficulty caring for patients as a result of a poor sign-out before their shift or duty.⁵ An evaluation plan should also include sharing the information learned with the participants of the process to solicit more improvements, suggestions, or comments on observed deficiencies. In essence, this becomes a closed-loop process by which handoffs can be the target of continuous quality improvement efforts.

Findings from the University of Chicago Hospitals

We offered the hand-off clinic to individual residencies that take in-house call on an inpatient service. The

Checklist Interview for Standard Handoff

1. Are there categories of content on a template that your program/discipline uses?

IF YES → For each category, what is an example of what is said (or written) or a common patient care issue that occurs that this content is used for?

2. In thinking about a time you participated (or observed) a "good" handoff, what types of information did you receive? How was it helpful in caring for a patient or performing your duty?

PROBE FOR ANY BIG CATEGORIES OF CONTENT → What would staff say (or write)? Can you give me some specific examples?

3. In thinking about a time you participated (or observed) a "poor" handoff, what types of information were missing or inadequate? How did it impair your ability to take care of patients or perform your duty?

PROBE FOR ANY BIG CATEGORIES OF CONTENT? → What would you wish staff would have said (or written)? Can you give me some specific examples?

Write the names of all of the big categories that emerged on the back of this sheet. Group like categories (to decrease redundancy) and think of a checklist acronym.

Figure 4. Interviewing participants in the hand-off process regarding the information that they desire or need can inform development of a hand-off checklist.

workshop employs a semistructured interview of residents to do the following:

- Develop a standardized process for the handoff using a process mapping methodology.
- Create a checklist of critical patient content.
- Plan for dissemination and training.

To date, 7 of 10 residency programs have participated. We used process analysis to highlight similarities, differences, and areas for improvement among protocols. The hand-off process is highly variable and discipline-specific. Several themes emerged, as highlighted in the following sections.

Themes from the Process Analysis

Respect the Discipline's Environment, Culture, and Needs. To tailor the hand-off protocol to its users, the local environment in which the handoff is occurring (for example, intensive care unit, emergency room) and the type of patients cared for need to be taken into account.

Although four of the seven residency programs had a designated hand-off location, the other three conducted handoffs wherever convenient. For example, obstetrics and gynecology and psychiatry have an official meeting time and a dedicated room for handoffs, whereas internal medicine handoffs occur whenever convenient for the on-call resident (for example, emergency room, call room, ward). Only two programs had more senior residents present at the handoff, although for all seven programs, senior residents and/or attendings (usually during morning rounds or shortly after) provided input to the content of written sign-out sheets used at the time of the handoff. Similarly, although content checklists all contained some form of administrative data (for example, patient name, medical record number, room number), certain disciplines required unique elements of content. For example, pediatrics sign-outs contained fields to describe custodial arrangements (for example, parents, state's office for child and family services), whereas surgical sign-outs

Standardized Content Checklist for Pediatric Handoff

- ✓ **P**roblem List
 - Any pertinent past medical history (e.g., cerebral palsy, seizure disorder)
 - Systems-based list of current problems
 - Focus on any invasive tubes/devices (e.g., GI-has g tube or Pulm-trach)
- ✓ **E**xpected tasks to be done
 - Any labs to check on and what to do about them
 - Tests to order or follow-up on (e.g., CT scans)
- ✓ **D**iagnostic one-liner
 - Includes age, sex, relevant past history related to current problem and current chief complaint/reason for hospitalization (4 yo F with history of chronic severe asthma here with status asthmaticus)
- ✓ **I**f/Then
 - Frequent issues to be expected with a plan to resolve using if/then format (e.g., “if HTN, please give Hydralazine”)
- ✓ **A**dministrative data/Advanced directives
 - Patient name, medical record number
 - Room number
 - Admission date
 - Primary inpatient team, attending
 - Family contact information
 - Weight/BSA (body surface area)
 - Code status
- ✓ **T**herapeutics
 - Medications (updated list of medications with doses (esp dates that any antibiotics were started and duration)
 - Diet with any weaning orders—Is the patient NPO?
 - IVF
 - Oxygen with weaning instructions
- ✓ **R**esults and other important facts
 - Labs (e.g., recent Hgb/Hct)
 - Cultures (esp any outside hospital cultures that were obtained)
 - Radiology test results
 - Consults
- ✓ **I**v Access/Invasive devices
 - IV access and what to do if it comes out overnight (e.g., “Has PIV, must be replaced if it falls out”)
 - Any invasive devices listed in problem list
- ✓ **C**ustody and Consent Issues
 - Is the patient DCFS (Department of Child and Family Services)?—if yes, need to get consents from them. Is child protective services involved?
 - Parental custody or any issues related to parental custody

Figure 5. The standardized content checklist for the pediatrics hand-off protocol is shown. GI, gastrointestinal; Pulm, pulmonary; g, gastrostomy; trach, tracheotomy; CT, computerized tomography; HTN, hypertension; NPO, nothing by mouth; IVF, intravenous fluid; Hgb, hemoglobin; Hct, hematocrit; PIV, peripheral intravenous.

contained fields for pre-operative and postoperative checks. Residents in one program described “information overload” and “being a slave” to continuous updating of the written sign-out. A resident in a different program stated that handoffs only occurred if acute patient issues were present.

Despite these variations, all seven participating residency specialties use both a written summary or sign-out and a verbal exchange to execute a handoff. However, the amount of information recorded on the written sign-out and discussed at the verbal exchange differ. Cognitive-based specialties such as internal medicine and psychiatry appear to have a longer written sign-out sheet and a longer verbal exchange for each patient. Meanwhile, procedure-based specialties such as orthopedic surgery appear to have a more concise written sign-out, with verbal exchange for only those patients with active issues.

Aim to Understand and Reduce Variation. Although most residency program chief residents could articulate a protocol that was routinely followed, they also referred to deviations from the protocol. For example, whereas all residents interviewed stated that verbal communication was required and should occur at the time of the hand-off, all residents acknowledged that it did not always occur. One surgical resident stated, “sometimes the on-call resident [receiving handoff] is in the operating room.” Indeed, the most common cause for the exceptions was the competing demands of resident work such that one of the participants was in the operating room, clinic, in transit to or from an off-site clinic, or otherwise unavailable for a handoff. However, at least one program chief stated that some residents coming on duty were more likely to make themselves available for verbal communication at the time of the handoff than others.

Highlight the Handoff as the Transfer of Professional Responsibility. The handoff is more than just transfer of information—it is also a transfer of professional responsibility. It is crucial that the handoff indicate a clear transfer of professional responsibility. When the transfer of professional responsibility occurs at the time or close to the time of the transfer of information, this process is transparent and easily understood. However, in many cases, the

transfer of professional responsibility was separated in time and space from the transfer of information. This separation can occur through a variety of different mechanisms. For example, some residencies, such as psychiatry, designate a certain time at which the incoming residents actively transfer responsibility of patients to themselves. The on-call psychiatry resident, who starts at 5:30 p.m., transfers a virtual pager to his or her own pager. By contrast, for other programs, departing residents may transfer their responsibility to someone else. In the internal medicine residency program, departing residents forward their pager to the on-call resident after they provide a verbal handoff.

Detect and Correct Vulnerabilities in the Handoff. A process map can be useful in assessing the integrity of the handoff process. By visualizing each step, vulnerabilities in the process can be detected and improved, as occurred in the neurology and pediatric residency programs. Patient tasks were assigned to other team members to facilitate timely departure of a postcall resident to comply with resident duty-hour restrictions. However, in both cases, no distinct mechanism was in place to communicate follow-up of these tasks, such as their completion or results, to the on-call intern. After examining the process maps, the chief residents incorporated closed-loop communication, requiring that follow-up that was divided among the medical team be relayed back to the on-call resident.

Implementation of the University of Chicago Hospitals Standardized Hand-off Protocols

Buy-in from senior leadership of stakeholders and ongoing education has been instrumental to the implementation of standardized hand-off protocols. Because this work deals with resident education and patient care, two stakeholders important to the success of implementation are the hospital leadership and leaders of graduate medical education, such as deans and program directors. With the support of the department of patient safety, in March 2006 we presented this initiative to the patient care committee, a subgroup of the hospital’s board of trustees, which included senior institutional leaders. We also briefed

all residency and fellowship program directors at the institution's graduate medical education retreat in November 2005. At this briefing, we reviewed the Joint Commission National Patient Safety Goal and key literature and introduced our model for a standardized hand-off protocol. A few days later, with the assistance of the department of patient safety, we contacted the chief residents (by e-mail and pager) to schedule the hand-off clinics. On its completion, all participants agreed that the protocol would help improve current hand-off mechanisms and facilitate education of new interns.

The standardized protocols, accompanied by an explanation of the new National Patient Safety Goal, were disseminated to all incoming house staff during the orientation for new interns in June 2006. Residency programs are now expected to provide in-service sessions to their residents on the discipline-specific hand-off protocols during each academic year. We continue to work with those residency programs that have not yet developed standardized hand-off protocols and are expanding our focus to nursing and other types of interdisciplinary handoffs. To date, the major barrier for participation in the hand-off clinic is scheduling a time that is convenient within the restraints of the residents' service obligations. To develop a formal monitoring and

evaluation process, we have partnered with the Illinois Hospital Association's 18-month Patient Safety Learning Collaborative on Handoffs, which currently has representatives from 26 Illinois hospitals.

Conclusion

The model to standardize the handoff has the potential to result in improved patient care. Mapping the process and building a standardized checklist of content can facilitate meeting the Joint Commission National Patient Safety Goal. Using opinion leaders and involving residents can be crucial to the success of disseminating the standardized hand-off protocol to resident physicians in an academic teaching hospital. **J**

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