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# FORUM

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## Reducing Risk During Handoffs

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# Patient Safety Solutions for Safer Healthcare Delivery

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CRICO/RMF HAS USED ANALYSIS OF MEDICAL MALPRACTICE claims and suits to understand the causes of error for more than 20 years. What we have learned is that the overwhelming majority of errors (64%) fall into four high risk areas: *diagnosis, obstetrics, surgery, and medication*. Working with our insured physicians and institutions, we create educational material and services that target risks in these areas, as well as address universal themes such as documentation and communication, to reduce the number of claims against our members and assist them in delivering the safest healthcare in the world.

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- **Forum<sup>2</sup> and CRICO/RMF Insight** are quarterly publications delivered via email, that contain articles by clinicians, attorneys, and other risk management experts. *Forum* provides in-depth analyses of medical malpractice cases and risk management issues. *CRICO/RMF Insight* offers timely claims data, case abstracts, legal perspectives and tips for clinicians to apply in their own practices.
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<sup>1</sup> The Commonwealth of Massachusetts Board of Registration in Medicine requires physician licensees to complete 100 hours of continuing medical education (CME) within the immediately preceding two years. Ten (10) hours of CME must be in the area of risk management.

<sup>2</sup> *Resource* and *Forum* qualify for Category I equivalency risk management credits in Massachusetts.

## Commentary: Fixing the Flaws in the Handoff Process

by John L. Mc Carthy, President, CRICO/RMF

Measured against the volume of health care interactions, malpractice cases are rare. But those that we do see often demonstrate a failure in the communication between health care providers “handing off” the responsibility for a patient who trusted them to perform that exchange seamlessly. Indeed, the vast majority of patient handoffs are unremarkable, but they are rarely seamless. Most do not occur under ideal conditions and, too often, key information is misstated or misunderstood. Only when the patient’s outcome is noticeably impacted, e.g., a delayed or missed diagnosis, are the flaws in the handoff process vividly exposed.

Over the years, the CRICO-insured institutions (and more recently, the Joint Commission) have recognized the handoffs problem. In this issue of *Forum*, we present a variety of approaches to better understanding the problem and highlight some promising initiatives. While many handoff-related initiatives involve a technology component, the primary focus of improving information exchanges is on the interactions between people. Can the individual who already knows the important patient information convey it clearly and succinctly to the clinician who needs to know it next? Can the receiving party capture, process, and clarify that information, and can that exchange be done consistently and efficiently? Electronic medical records and other computer systems can support better handoffs, but human communication skills need equal attention.

While handoffs are mostly about physicians and nurses, patients and their families are also a key element, especially at the beginning of a care process when providers are first learning the patient’s story, and at the end when the patient is being discharged home. Fully engaging patients and family members adds an important safeguard when care is transferred from provider A to provider B; they only need to remember the facts for one case (theirs). On the other hand, however, patients (and families) are not standardized—some over contribute, while many others cannot or will not adequately convey or absorb all the necessary information. Relying on these patients as the sole source of crucial clinical information can be as risky as leaving them out of the conversation. Communication systems and individual providers must be able to adjust between the two extremes.



The multi-faceted handoff issues seen in CRICO claims, and the research taking place here and throughout the health care industry, leads us to a short list of factors key to reaching the goal of seamless communication of patient information between providers exchanging patient responsibility:

- standardize the process as much as possible;
- assess, improve, and maintain clinicians’ communication skills;
- make clinical information available in real time in a clear and concise manner to providers, patients, and families;
- avoid over-reliance on the patient and his or her family members; and
- back up the provider’s memory with a less fallible system.

Attention to this combination of human and technological approaches—even when no one is noticing handoff problems—should go far toward fixing many of the flaws. ■

# The Loss of Key Information

A 21-year-old woman with multiple birth defects and diabetes insipidus underwent successful surgery, but suffered post-operative brain damage.

by CRICO/RMF Staff

CASE STUDY

## Key Lessons

- Structure and teamwork are necessary for consistently safe handoffs of patient care to other providers or settings.
- Family members have a role on the care team, but not a responsibility to convey information between providers.
- Formal and standard handoffs keep critical information in the forefront, especially over multiple exchanges.

## Clinical Sequence

A 21-year-old woman with a history of multiple birth defects, was scheduled for hip surgery. She was non-verbal (but could communicate with facial expressions, and to a limited extent, via a computer translator) and dependent on family members for all aspects of daily living. She also suffered mild diabetes insipidus (DI), otherwise known as “water diabetes.” DI is a rare disease in which the kidneys produce abnormally large volumes of diluted urine. This patient’s DI was managed at home by her mother with careful attention to her fluid intake. Three years prior to this surgery, she had undergone a similar orthopedic procedure and had an extended admission due to hypernatremia.

Two weeks prior to surgery, at the pre-op appointment, the patient’s mother reminded the surgeon—and the resident assisting him—of her daughter’s DI and her previous post-op complication. They acknowledged her concern, and the attending told her to “make sure” that the anesthesiologist understood. She spoke with the anesthesiologist later that day.

Upon admission, the patient’s DI was documented by the nurse practitioner on the anesthesia assessment form. Pre-op serum sodium was in the normal range (135–148). Because of the patient’s DI, the anesthesiologist closely monitored her electrolytes during surgery.

Halfway through the procedure, the surgical resident was called to another case. He was replaced by an orthopedic fellow, who did not know the patient, and the surgery was completed successfully. Immediately after the surgery, the attending surgeon left for vacation. The fellow wrote the post-op orders but—unfamiliar with the patient’s medical history—did not include serial labs or adequate fluid intake. The PACU nurse did not pay particular attention to the patient’s electrolytes or fluid balance. The patient was transferred to the floor, where the nurse was unaware of her DI.

The next day, the mother told the nurse on duty that her daughter had DI, and gave her a worksheet of what her hour-by-hour fluid intake should be. This nurse made note of it, but did not follow up on it, assuming the physician’s orders covered the patient’s needs. The patient was visited by the orthopedic resident each post-op day.

Four days post-op, she became somnolent and experienced seizure-like activity. Not understanding DI, the nurses had not made it known when the patient was becoming more withdrawn. When she slipped into a coma and developed aspiration pneumonia, a chart review indicated that her sodium levels had gone unchecked for three days; upon testing, it was 185. She was transferred to the MICU where, over several days, her electrolyte and fluid imbalance was corrected. An MRI showed brain damage (including changes of osmotic demyelinating syndrome of the pons, thalamus, cerebellum, and basal ganglia). She is no longer able to communicate in any fashion with her family and now lives in a long-term nursing home.

## Timeline of Events

### Handoff

Wheelchair bound, non-verbal 21-year-old female with diabetes insipidus scheduled for elective left hip surgery

*Issue*

### Family to MD

#### Two weeks pre-op

- Mother reminds attending surgeon and resident of previous post-op complications (hypernatremia)
- Attending tells her to “make sure” anesthesiologist is also aware
- Mother speaks to the anesthesiologist and NP re: patient’s DI

*Relying on family member to convey clinical information*

#### 8:00 am–2:00 pm (in surgery)

- Patient receives 500 ml lactated ringers/hour
- Anesthesiologist monitors the patient’s electrolytes closely

### Resident to Fellow

11:00 am (in surgery)  
Resident called away, replaced by orthopedic fellow

*Provider assuming responsibility is unfamiliar with patient*

## Allegation

The parents sued the orthopedic surgeon, alleging delayed diagnosis and treatment of postoperative complications, resulting in dangerous elevation of serum sodium levels and permanent brain damage.

## Disposition

The case was settled for more than \$1 million.

## Analysis

1. This patient's care was characterized by assumptions: the attending surgeon assumed that the mother would tell the anesthesiologist about the DI or that the covering physicians would consider it in the post-op care; the floor nurse assumed that the fellow's post-op orders addressed anything the mother was worried about, etc.

Most areas for improvement across settings of highly committed providers are in how the care experience is structured at critical junctures—hand-offs—such as transitions from primary care to surgery to post-op, or transitions among providers (including attending-to-resident). The goals are to keep providers aware of complicating factors that increase risk to the patient, and to ensure appropriate monitoring and timely response. The tools to reach these goals might include mandatory consults for certain conditions, problem lists and care plans that go with the patient from site to site, or communication protocols, such as pre-and-post-op huddles.

2. Before the surgery, the attending surgeon relied on the patient's mother to convey important information to the anesthesiologist. Later on, when the mother tried to share her worksheet on fluid intake with the nurse, she was marginalized.

While parents, spouses, or adult children are often active members of the care team who deserve the full respect of the clinicians involved, they do not bear formal responsibility for transmitting information between clinicians. A safer approach is to rely on engaged family members for redundancy, but not as the primary—or sole—communicator.

3. At a critical point in this surgery, responsibility for the patient was transferred from the attending who knew the patient to a colleague who did not. His unfamiliarity with the patient was evident in his suboptimal post-op orders.

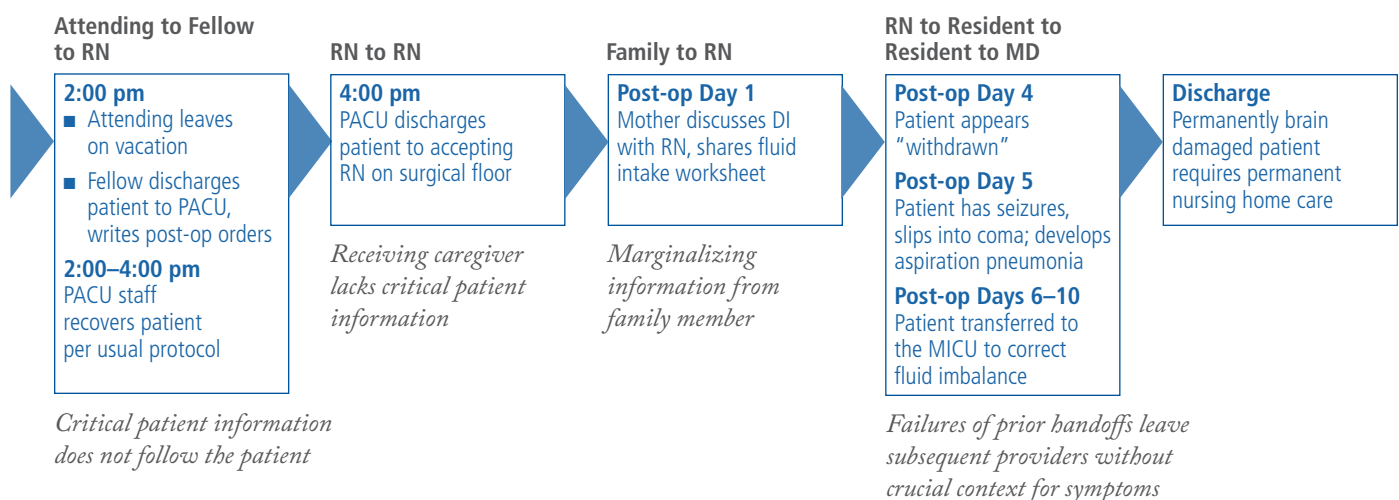
Shifting responsibility within a teaching hospital OR is common, as attendings and senior house staff often handle multiple cases simultaneously. Since it is a common occurrence, a standardized process for what information needs to be handed off—and how it's done—can help "unfamiliar" providers effectively get up to speed.

4. The lead surgeon scheduled a vacation immediately following this elective surgery, with no written or oral instructions to manage the DI.

Ideally, an elective surgery can be scheduled when the surgeon will be around for post-op care; but reliable care should not be dependent on the presence of one practitioner. A formal handoff to the covering physician, including a review of any complicating clinical issues, protects the patient and reassures the exiting physician.

5. Despite a long medical history, pre-op forms, and an engaged mother, the post-op care team lost track of this patient's diabetes insipidus and misread the related symptoms for several days.

A lot of information moves with each patient through his or her course of care, some of it is critical, but much of it is "noise." At each transfer of responsibility, the assuming providers determine which pieces of information are essential to their tasks and responsibilities. Without a formal and standardized process for information exchange, those determinations may be misguided...and patients suffer from errors of omission.





# CRICO's Handoff-related Cases

by Jock Hoffman, Editor

Virtually all medical care involves handing off patient information, or responsibility: patient-to-nurse, nurse-to-physician, primary care physician-to-specialist, specialist-to-patient, and so on. Fortunately, the vast majority of those exchanges go smoothly and the course of diagnosis and treatment is unimpeded. Unfortunately, when a handoff is “fumbled”—when critical information is incorrect or not transmitted (or transmitted but not received)—the receiving caregivers are undermined and the patient is exposed to unnecessary risk.

Over the past five years, handoff-related cases represent more than \$173 million in incurred losses for the CRICO-insured institutions. Nearly 400 physicians and more than 70 nurses have been named in 268 claims and suits with a handoff-related complaint.<sup>1</sup> More than half of those cases involved a high-severity injury.<sup>2</sup> Handoffs between peers and those across disciplines are equally vulnerable. More than half of the cases occurred in the outpatient setting, with transfers from outpatient to hospital-based care also common in the handoff-related events.

## Examples from CRICO Handoff-related Malpractice Cases

**An obese 50-year-old smoker** with hypertension, arteriosclerosis, and elevated cholesterol (and a strong family history of heart failure) went to his PCP for lightheadedness and nausea. He was diagnosed with otitis media and given antibiotics. As his symptoms continued, he was referred to an ENT, who noted diplopia and dizziness. Later, the patient saw the physician assistant in his PCP's office for a cholesterol check. Immediately following, he went to an eye appointment with an optometrist who (incorrectly) assumed the PCP was aware that the patient's diplopia was unresolved and further assumed that follow-up tests had been scheduled. Two weeks later, the patient suffered a stroke.

**A 39-year-old patient** was seen by a gynecologist who noted a 5 cm ovarian cyst on the ultrasound that verified the patient's (first) pregnancy. Because she had had difficulty conceiving, the patient declined further sonography to better assess the cyst. For the duration of her pregnancy, the patient was seen by her obstetrician, who was unaware of the gynecologist's initial ultrasound findings. A subsequent ultrasound revealed the cyst had enlarged with thin septations, but the obstetrician failed to appreciate those findings. Seven months after an uneventful delivery, the patient was hospitalized with a large metastatic pelvic mass. She died 18 months later.

**A 40-year-old female** was diagnosed with a left adrenal mass (via CT and MRI). In a letter to the surgeon, the endocrinologist inadvertently identified the mass as being on the right, and suggested its removal. Prior to surgery the surgeon wrote back to the endocrinologist referencing the plan for a right adrenalectomy. At the pre-op appointment, the staff failed to identify the discrepancy (even though pertinent information was available in the CT report, MRI report and MD notes). The wrong adrenal gland was removed; one month later the patient underwent a left adrenalectomy and is now being treated for acquired Addison's disease. ■

### Notes

- 1 Identified via analysis of risk management issues coded for each CRICO case.
- 2 Includes death and permanent grave, permanent major, and permanent significant injuries.
- 3 Multiple risk management issues may be coded for a single case. Percentages shown reflect the percent of cases in which each factor was noted.

## Sample Handoff Types

- Non-CRICO facility → CRICO facility
- OR → post-op
- ED → inpatient
- ED → Lab/Imaging → PCP → Outpatient
- Senior resident ↔ Junior resident
- OB office ↔ Labor & Delivery
- Midwife ↔ Obstetrician
- Responsible MD ↔ Covering MD
- Exiting RN ↔ Arriving RN

## CRICO Handoff-related Cases<sup>1</sup>

Asserted July 2001–June 2006 (N=268)

Open	54%
Closed	43%
Closed with payment	46%

### Claimants

Outpatient	54%
Inpatient	46%

### Severity

High	57%
Medium	35%
Low	7%

### Top Responsible Services

General Medicine	19%
Obstetrics/Gynecology	12%
Emergency	9%
Nursing	7%
General Surgery	6%
Orthopedics	6%
Radiology	5%

### Top Allegations

Diagnosis-related	35%
Treatment-related	17%
Surgery-related	16%
Medication-related	10%
Obstetrics-related	7%

### Top Risk Management Issues<sup>3</sup>

Communication among providers re: pt condition	50%
Non-CRICO providers involved	16%
Resident supervision	13%
Consult delayed or not ordered	12%
Test delayed or not ordered	11%
Responsible MD not identified	11%

### Top MD Defendants (N=398)

General Medicine	23%
Obstetrics/Gynecology	12%
General Surgery	12%
Cardiology	6%
Emergency	6%
Pediatrics/Neonatology	6%
Orthopedics	5%

### Nurse Defendants (N=72)

RN	74%
NP	13%
CNM	13%

# Why the Joint Commission Cares About Handoff Strategy

by Peter Angood, MD

Dr. Angood is Vice President and Chief Patient Safety Officer for the Joint Commission and Co-Director for the Joint Commission International Center for Patient Safety.

**I**mplement a standardized approach to “hand off” communications, including an opportunity to ask and respond to questions—*Joint Commission 2006–2007 National Patient Safety Goal 2E*

The primary purpose of the Joint Commission sentinel event database, now coming into its 12<sup>th</sup> year, is to have accredited organizations report sentinel events and conduct root cause analyses. The overall intent is to improve the processes of care and learn what can be prevented in the future. The second purpose of that database is to review the statistics on a regular basis in order to identify national trends.

In reviewing the sentinel event database over the years, the leading national trend—and problem—is, consistently, communication. Within the realm of communication, the issue of “fumbled” handoffs is recurring day in/day out: professional-to-professional as well as setting-to-setting (in a wide variety of settings).

For context, envision a map outlining the path of a patient we’ll call Mark, who comes into the hospital through the Emergency Department (ED). Mark is transported for a procedure (e.g., cath lab, operating room), then he goes to the ICU, then to a regular floor, and then—seven days after having presented to the ED—Mark gets discharged.

Over that one-week hospital stay, the number of communication handoffs is huge and therefore the number of opportunities for *miscommunication* is equally huge. Many times during that week many providers need to share many pieces of information about the processes going on in Mark’s acute care and how that impacts Mark’s disease, plus his comorbid diseases, throughout his hospital stay: What diagnostic studies? What therapeutic studies? What are the changes in Mark’s medications? What is changing in nursing practices?

Every one of those steps is an opportunity for a miscommunication in a handoff, whether it is staff-to-staff, in and out of a procedural area, changing floors, or at discharge. Further handoffs are necessary when Mark is back home or at another facility: making sure that his primary care physician is aware of all that has occurred and any changes in Mark’s baseline medical status, as well as his medications.

## Remedies

The Joint Commission goals cannot be specific for each individual situation: the overall purpose is to encourage better communication—with specific attention to handoffs—regardless

of the size of the organization, or the setting, or the number of practitioners involved. The ultimate goal is still to improve the communication in all handoffs of patient information and responsibility, and most institutions are undertaking concerted efforts to do that. Nevertheless, the health care industry still has a long way to go and the Joint Commission encourages institutions to keep working on consistency, whether it is adoption and use of a form or a process, or spreading a successful solution throughout the entire system of providers and settings.

The Joint Commission’s patient safety goals have, historically, not been too prescriptive; each institution has a unique culture and unique systems, and each should be allowed some independence in terms of how to solve its problems. The Joint Commission is not looking for Form X, the focus is more on the process. What the surveyors *are* looking for is: 1) evidence that the patient safety goal has been identified as an issue, 2) evidence that the institution is able to address the mechanisms, 3) whether the organization has taken a look at the handoffs issue and the criteria, 4) what types of tools have been put into place to actually make it successful, and 5) what processes are in place to review the success or to review the problems that are identified through the use of those tools and methods.

It is not so much the success or failure, per se, but the intent and the rigor of the intent that is going on to try and identify, measure, and improve. Different institutions are at different stages of development and if the accreditation survey indicates clear intent and demonstration of ongoing activity, then that’s viewed favorably.

## Institutional Response

To date, institutional response to Goal 2E is all over the map. Improving handoffs is a complex problem: institutions that have sophisticated processes (and run well overall) tend to have taken on this problem early and developed ways to manage it. The majority of organizations are still struggling with how to manage it, with variable success. And those organizations that are still not attacking the problem aggressively, may not yet recognize that this is one of their predominant patient safety problems.

Rather than disparate solutions for different exchange types, a unified handoff process seems more likely to improve performance overall, i.e., a transfer of a patient from the ED up to the ICU is similar from the ICU to the floor, and that is similar to what goes on at discharge. The staff-to-staff transfers are fairly

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# The Handoff: A Critical Point of Vulnerability

by Christopher P. Landrigan, MD, MPH

Dr. Landrigan is Director of the Sleep and Patient Safety Program, Division of Sleep Medicine at Brigham and Women's Hospital (Boston); Research and Fellowship Director, Inpatient Pediatrics Service at Children's Hospital Boston; and an Assistant Professor of Pediatrics and Medicine at Harvard Medical School.

Over the past decade, communication failures have become widely recognized as a leading safety hazard in health care. In root cause analyses, nearly 80 percent of serious medical errors involve miscommunications.<sup>1</sup> The Joint Commission, the National Quality Foundation, and the Department of Defense Patient Safety Center have each called for the development of high-quality communication tools and processes with a goal toward ensuring that critical patient information gets appropriately transmitted and received.<sup>2-4</sup>

The "handoff," i.e., the transfer of patient information and responsibility between health care providers, is an especially critical point of vulnerability to communication error.<sup>5-7</sup> Handoffs occur at every hospital shift change, and whenever a patient changes locations. Omissions of critical information—as well as provision of outdated or frankly erroneous information—occur frequently.<sup>8</sup> Exacerbating this problem are: 1) the rising acuity of hospitalized patients; 2) the need for complex teams of primary providers and sub-specialists to care for sicker patients; and 3) resident-physician work hour reductions.<sup>9-12</sup>

Discontinuities in care pose a risk to safety, but only a few studies have quantified those risks, and even fewer have evaluated the use of communication technologies to improve the handoff process (and, thus, patient safety). Some examples:

- Researchers investigating resident work hour reductions in New York State found that the presumed increase in discontinuity caused by the institution of night-float systems resulted in delayed test ordering and an increase in hospital complications.<sup>13</sup>
- Petersen et al evaluated potentially preventable adverse events in medical inpatients and found that these events were much more likely to occur if the patient was under the care of a physician from a "non-primary" team (e.g., the cross-covering or night-float intern).<sup>14</sup>
- Similarly, in a military setting (specifically, a university-affiliated Veterans Administration Hospital) patients admitted by resident night-floats had longer lengths of stay and increased laboratory testing.<sup>15</sup>
- Investigators affiliated with Harvard Medi-

The intervention did result in a significant overall reduction in serious medical errors—including a five-fold reduction in serious diagnostic errors...

cal School have been involved in a number of studies that have shed further light on this issue. The first was a randomized trial of a scheduling intervention that eliminated 24-hour shifts and reduced house officers' weekly work hours while, at the same time, introducing an additional handoff in care (*due* to reduced work hours).<sup>16</sup> The intervention did result in a significant overall reduction in serious medical errors—including a five-fold reduction in serious diagnostic errors—however, avoidable miscommunications were still reported. That study has led to a strong interest in developing communication tools to assist with scheduling interventions.

- In a recent study of handoffs from the operating room to the ICU, communication errors occurred in 100 percent of sign-outs; most contained multiple errors.<sup>17</sup> Many of those errors could have been prevented with the use of a simple, computerized sign-out tool.
- In a focus group study of residents from Boston's Brigham and Women's Hospital (BWH) and two other academic centers, it was found that wide variation occurred both in the process and content of sign-out.<sup>18</sup> At BWH in particular, only 52 percent of residents provided written and oral sign-out on every patient, and only 86 percent updated the written sign-out on a daily basis. Only 55 percent of night-float residents reported that the relevant information was available in the sign-out at night when needed.<sup>19</sup>

To date, the adoption of computerized sign-out tools has been slow, in part due to an absence of data supporting their use, and due to a limited availability of high quality commercial or widely disseminated products. An enhanced, structured computer sign-out has been found, in one study, to reduce the risk of adverse events associated with cross-coverage of patients by house staff less familiar with them.<sup>20</sup>

As noted, some preliminary studies indicate that improved sign-out processes and tools hold promise of further improving handoffs, and thus improving care. But, before widespread implementation can occur, further evidence of their effectiveness is needed, as is refinement for use in diverse environments. ■

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uniform, so you know that—whether it is a traveler nurse or a resident or an attending or an intermittent consultant—both parties in the handoff go through the same processes, use common forms, etc.

Getting physicians enthusiastically engaged in improving handoffs is tough; not many institutions have solved that problem. Those that are succeeding are those where the medical staff leaders have been able to involve both the hospital-based physicians and the affiliated physicians in fixing the handoff problems even though the actual mechanics of “fixing it” vary. On the other hand, facilities where the medical staff is not totally focused on solving the problem, i.e., when physician groups are functioning independently and autonomously and with no rigor, are (obviously) not getting better.

Institutions that have electronic medical records (EMR) throughout their system may do slightly better, but EMR is not *the* solution. It still has fairly poor penetration within the health care industry overall, and those facilities that do have it in place are still learning how best to employ it. (See [Utilizing EMR Features to Improve Handoffs](#), p 18.) Reading what your predecessor wrote—whether on paper or in a computer—does not mean that an effective handoff has actually occurred. Without the, sometimes subtle, oral and visual cues of a person-to-person exchange and the opportunity to get questions answered, the EMR adds little in terms of handoff safety. Perhaps the biggest advantage of EMRs, at this stage in their development, is that they can help an organization implement standard templates and forms to facilitate handoff improvements.

The handoff problem is not an easy one to decipher and fix; disciplines, specialties, and individuals are highly variable in what information they divulge and how they do it. That ranges from no communication whatsoever (“find me if there is a problem”) to a tediously detailed report that may inadvertently bury the key points. Finding the happy balance between those two extremes is what the Joint Commission encourages medical staff to work towards in terms of viewing policies and procedures. To succeed, the organized medical staff needs to have a set of policies and procedures in place that can be effectively monitored, measured, and addressed in order to improve this part of the communication process. ■

# Heuristics for Designing Coordination During Patient Handoffs

by Emily S. Patterson and David D. Woods

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Investigations of undesired health care outcomes often reveal that someone at some point in time knew something important that was not communicated to a relevant party: a misstep that could be viewed as an error of “omission.” Such cases may be absent an overt mistake, but they reflect a failure of one or more caregivers to take into account critical information. Comprehensive exchange of that information might have “reframed” a problem during analysis—leading to an alternate diagnosis—or else identified an important aspect to consider during planning, such as the need to address a side effect of a particular treatment plan. And even when providers are diligent about exchanging critical patient information during transitions of authority, such as a patient handoff, patients can suffer unnecessarily if the providers fail to transfer information that—while not critically important immediately—might become extremely important later.

Over the past several years, medicine has looked to better understand and apply the science of human factors to improve care processes and reduce errors and preventable patient harm. Three heuristics for designing effective coordination provide insight into how the science of human factors can help us improve handoff processes.

## Reduce, Reveal, and Focus

As captured by the cognitive triad, *practitioners* supported by *tools* meet the complexity demands of a particular *setting*.<sup>1</sup> Primary functions of this unit are analysis and (re)planning. As these functions are necessarily distributed across human and machine agents, communication is required to coordinate. This coordination is delineated by organizational roles, procedures to synchronize activities and mediate access to shared resources, and social rules (norms).

We have proposed three heuristics for designing effective coordination: reduce, reveal, and focus.<sup>2</sup>

**The first heuristic is to reduce complexity.** For example, patient location changes and multiple providers from different specialties increase complexity. Strategies could be employed to minimize these, when it is possible to do so without incurring high costs on tradeoff dimensions such as profitability. For example, “bumpable” patients in the Intensive Care Unit could be proactively moved prior to the earliest possible completion of a particular operation in order to eliminate unnecessary transitions when a patient must wait for an available bed.<sup>3</sup>

**The second heuristic is to reveal hidden (private) events and activities.** When work is rendered observable, costly coordinative meetings can be replaced with indirect, lightweight, peripheral (“out of the corner of the eye”) coordination, which reduces



the need for direct communication. Traditionally, this heuristic has been implemented through the design of specialized tools, although environmental design and communication technologies have also been explored. The traditional approach is to have software with an overview “at a glance” visual display of the current status of a work process in parallel with a detailed view. By placing the display in a shared physical space, it serves as a “common ground” that enables gesturing to efficiently signal movement between pre-identified discussion topics.

Although designing “at a glance” displays is a challenging process—and the final visualizations can appear unique—common themes are to highlight:

- differences from typical assessments and plans (e.g., surgeon not informed of a patient’s overnight death before talking with family);
- activities of other agents (e.g., confusion regarding which specialty should order an X-ray);
- stances of stakeholders towards key decisions (e.g., the “aside” notes regarding family dynamics likely include this information); and
- constraints and side effects for contingency plans (e.g., impacts of a delayed operation on treatment plan).

**The third heuristic is to focus attention.** Generally, clinicians direct their attention towards a patient’s most unstable parameter. This becomes more challenging when stability assessments are inaccurate or events occur that render a “stable” parameter unstable. The primary solution is to enable peripheral detection of unexpected events and actions while performing primary tasks. Although there are distinct advantages to peripheral monitoring via audio data (since the visual perceptual channel tends to be overloaded), similar benefits can be realized with visual displays.<sup>4</sup> These displays generally reduce search and navigation costs by employing advanced visualization techniques.<sup>5</sup>



### Trade-offs in Handoff Design

In any complex domain, and health care is as complex as they come, every design effort requires trading off competing goals. Some of the trade-offs that might play a role in designing handoffs include:

- **Standardization vs. flexibility:** some critical situations require that handoffs are shortened, dropped, or done by someone else, so 100 percent compliance with a particular method is not always desirable. Being able to respond to unanticipated events can be difficult if forms or checklists are too restrictive.
- **Efficiency vs. effectiveness:** since there is a cost for practitioners to be tied up in a handoff, a good handoff is not exhaustive in information content; on the other hand, a shorter and more efficient handoff might miss something critical. Context-specific factors will guide this trade-off: the criticality of competing priorities, workload, case complexity, patient stability, sender's and receiver's familiarity with the case, deviations from routine, how long since the patient has been admitted, and requests for resources that are difficult to obtain.
- **Availability to give an update vs. intimacy of knowledge;** ideally, handoffs are given by someone with intimate knowledge of the patient—rather than a charge nurse or other person more available or higher in the hierarchy. However, in some cases, less experienced people, even if they were present for the entire case (e.g., a medical student following an operation), cannot fulfill this function because they can't adequately discern what needs to be reported.
- **Short-term vs. long-term information needs:** clearly, receiving clinicians need to capture information for future needs, but what front line practitioners need foremost is detailed information that gets them through the day-

to-day operations more effectively. The most valuable content in a handoff is probably sensitive or short-term information that may not be captured in the patient's permanent record.

- **Direct vs. indirect audience:** obviously, the person who will be directly taking care of the patient needs to receive information during a handoff update, but others benefit from overhearing the update. For example, a charge nurse may need to know what patient is the most "bumpable" if a bed needs to be freed up quickly. In addition, erroneous assumptions may be detected, such as if a nurse overhears an update on a patient that he or she cared for the previous day. Therefore, a face-to-face update may provide the opportunity for the incoming person to interactively ask questions, but may lose the opportunity for others to overhear the update. ■

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# Communication Handoffs: One Hospital's Approach

by Ailish M. Wilkie and Caprice C. Greenberg, MD, MPH

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**F**or hospitals, the “hand-off” has long been the Bermuda Triangle of health care: dangerous errors and oversights can occur in the gap when a patient is moved to another unit or turned over to a new nurse or doctor during a shift change. —*Laura Landro, The Wall Street Journal, 6/28/06*<sup>1</sup>

In 2006, communication breakdowns contributed to nearly 70 percent of the sentinel events reported to the Joint Commission.<sup>2</sup> Obviously, adequate communication is essential for the safe transfer of a patient from one setting to the next and the hand off of care from one caregiver to the next. Thus, when communication breaks down, patient safety can be in jeopardy.

Neither handoffs nor communication breakdowns are unique to health care. Researchers who studied such high-risk settings as air traffic control towers, nuclear power control rooms, and railroad and ambulance dispatch centers found similar problems, and they have identified some handoff strategies that could potentially be adapted to health care.<sup>3</sup> The important components of a successful handoff include:

- conduct face-to-face oral updates with interactive questioning,
- limit interruptions and other activities,
- allow both parties to initiate topics,
- the receiver should review pertinent data before the handoff,
- present data in the same order every time,
- the receiver should read-back acquired information, and
- transfer responsibility unambiguously.

Unfortunately, in health care, handoffs tend to fall short of the ideal. More often, they are haphazard communications that occur in the midst of hectic clinical activities. Tension and stress can be high, interruptions are frequent, and the order and manner of information exchange is not standardized. As the evidence mounts linking poor communication and patient harm, regulatory agencies are joining the effort to improve patient handoffs. The Joint Commission has included the improvement of communication among caregivers and the standardization of handoff communications as a National Patient Safety Goal. The Joint Commission expects its accredited organization to conduct patient handoffs as uninterrupted and interactive exchanges of relevant patient information with an opportunity for questions, allowing the incoming caregiver to clarify any uncertainties that he or she may have. Hospitals across the United States are challenged to meet those goals (see [Angood](#), page 5).

## The BWH Experience

At Boston's Brigham and Women's Hospital (BWH), the Patient Safety team<sup>4</sup> conducted an initial review of current systems to identify areas and services at highest risk for communication failures, and to determine what, if any, best practices existed around handoffs. The initial finding was wide variability in handoffs across and within departments. Some lacked any standardization of the process, and practice did not necessarily follow stated guidelines when they did exist. A second key finding was that too much non-pertinent information was communicated during many exchanges, making them inefficient.

A multidisciplinary steering committee was established to create a plan for assessing and improving handoffs across BWH in order to be in compliance with the Joint Commission goals by January 2006. The steering committee determined that the highest risk areas included nurse-to-nurse, resident-to-resident, and OR-to-PACU handoffs. These were the targets of Phase I. Phase II, which is currently underway, is addressing attending-to-attending, procedural areas, and ambulatory settings. Sub-groups of key staff in each area were directed to identify handoff issues and obstacles and then implement new systems to address them.

## Nursing

The review of nursing practice found that two methods of handoff existed: some areas used face-to-face oral reports and others taped a report which was listened to at the change of shift, with both incoming and outgoing caregivers present. While neither of these systems was working perfectly, there were benefits to each method depending on the clinical area. The committee decided to focus on content rather than format, setting best practices and standardizing the order in which information was presented.

## Resident-Physician Assistant

Surveys were conducted among chief residents for each clinical service within the hospital to determine how residents and physician assistants were handing off patients. Not unexpectedly, this varied considerably by service, and none had a true best practice. Some services used a computer-based, templated sign-out system available through the hospital's computerized order entry system to aid in handoffs. Unfortunately, this template was not uniformly applicable across services in its current format.

Guidelines were developed to address problems that appeared across disciplines and standardize content. ID badge inserts describing best practices were created to remind staff of the



critical information that must be communicated during the handoff. One recommendation is that staff conduct handoffs using the SBAR (situation, background, assessment, recommendation) technique in an effort to further standardize the process and eliminate non-pertinent information.<sup>5</sup> Also resulting from this work, computer system enhancements were identified and are being implemented which will help those services who were not previously using the comprehensive computerized sign-out.

#### *OR-to-PACU*

BWH was encouraged to discover that the OR and PACU were already addressing issues related to handoffs before the Joint Commission announced its goals. Several improvement efforts were underway within these areas when this institution-wide improvement effort began. The BWH Patient Safety committee's review highlighted the fact that a templated report had been developed, but was not being used consistently. Handoffs from anesthesiologists to the PACU team had been standardized, however reporting from the OR nurses to PACU nurses was quite variable and unstructured. A multidisciplinary group was charged with improving upon the existing templated report and fully implementing this standardized process among OR and PACU disciplines. The main goal was to create a standardized report that would accurately and efficiently relay all necessary information from the intra-operative team to the PACU team while minimizing redundancy across disciplines and encouraging cross-disciplinary collaboration.

In order to have a baseline assessment to evaluate the success of the effort, as well as to determine where improvements were needed, BWH conducted a pre-intervention field observation in the PACU. During this observation period, a significant number of suboptimal handoffs (i.e., omitting basic information) were noted. The average length of the OR to PACU handoffs was approximately 14 minutes, but ranged from 5 to 22 minutes. Additionally, the content and order in which information was presented was haphazard and not standardized. Given the guidelines already in place, these findings were surprising, but they emphasized the need for further work among those who previously thought these processes did not require improvement.

The committee, with representatives from OR nursing, Anesthesia, Surgery, and PACU nursing agreed upon content, role, format, and the order of presentation. ID badge inserts with the expected handoff were then created and distributed to all staff. Additionally, the handoff was presented in a series of staff forums and large posters in the PACU.

One month after BWH standardized the content and disseminated the revised expectation across disciplines, a second set of observations revealed remarkable improvement. The staff had clearly understood and embraced the newly implemented guidelines. The time to complete a handoff was reduced by an average of seven minutes, and duplicate information was minimized. Feedback from frontline providers was positive; they now had a clearer expectation of what information should be communicated by each provider and in what order. And, they believed, accidental omissions were more likely to be recognized with the new process.

A final observation was conducted six months later to assess whether the improvement efforts were sustainable. While the improvements over the observations from the pre-implementation phase were notable, there was a small decrease in compliance from what had been seen immediately post-implementation.

#### Conclusions and Recommendations

The BWH approach to standardize handoff communications across high-risk areas has proven successful—although not without challenges. As with any new initiative, gaining the support of both senior institutional leaders as well as front-line staff was imperative for success. This project to standardize handoffs and communication in high-risk areas and across disciplines has established consistent standards that resulted in a safer environment for BWH patients and a more streamlined process for BWH providers. ■

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- 4 The Patient Safety team included participation by the Medical Director, Patient Safety Manager, and the Manager for Quality and Safety.
- 5 In order to facilitate communication during its high intensity situations, the United States Navy developed the SBAR technique which has successfully been adapted to health care. SBAR establishes an expected pattern of communication which creates redundancy. In this way, errors and omissions of information are more evident when there is a deviation from the expected transmission.



# The Hospitalist-to-Primary Care Handoff

by Alexander Carbo, MD and Joseph Li, MD

Drs. Carbo and Li are hospitalists at Beth Israel Deaconess Medical Center (Boston).

When the hospital medicine movement began, hospitalists and primary care providers (PCPs) understood that, along with patient dissatisfaction caused by assignment of a new physician, the largest potential drawback of the hospital medicine system would be the creation of an information “voltage drop” between inpatient and outpatient care providers.<sup>1</sup> Without the benefits of a seamless electronic medical record, admitting hospitalists would lack access to outpatient clinical information; likewise, PCPs would not be privy to information gathered during the hospitalization.

The first voltage drop occurs at the time of admission. If the PCP is not contacted by the emergency department (ED) staff or the admitting team, the accepting providers will have difficulty determining accurate medication lists, allergies, and problem lists. At Boston’s Beth Israel Deaconess Medical Center (BIDMC), ED physicians use a computerized dashboard which displays vital patient information, including a link to the PCP’s contact information. In addition, templated written progress notes prompt ED physicians to contact PCPs.

The next potential for a voltage drop occurs during the course of the patient’s admission and hospital stay—with the largest risk at discharge. Hospitalists have employed various strategies to keep PCPs informed of their patient’s clinical status, including telephone calls from the hospitalist to the PCP, faxing daily progress notes, and encouraging PCPs to call their hospitalized patients.<sup>2,3</sup> Nevertheless, this remains an ongoing problem: recent studies have emphasized that less than half of all PCPs are provided information about the discharge medications and plans for their recently hospitalized patients.<sup>4</sup> These “fumbled handoffs” represent a significant challenge to patient safety.<sup>5</sup>

Recognizing the need for clear communication among providers, the Society for Hospital Medicine identified the Patient Handoff as one of the Core Competencies for hospital medicine physicians.<sup>6</sup> While not limited to the interactions between hospitalists and PCPs, this core competency set out the following knowledge, skills, and attitude goals for hospitalists.<sup>6</sup>

## Knowledge

- Describe key elements in signing out a patient;
- explain important information that should be communicated during patient sign-out; and
- explain how the components, strategies, and specific information provided at sign-out might vary.

## Skills

- Communicate effectively during patient sign-out;
- utilize the most efficient and effective verbal and written communication modalities;

- document updated clinical status, recent and pending test and study results, a complete problem list, and plans for continued care; and
- anticipate what may go wrong with a patient after a transition in care and communicate this clearly to the receiving physician.

## Attitude

- Recognize the impact of effective and ineffective patient sign-outs on patient safety; and
- lead, coordinate, or participate in initiatives to develop and implement new protocols to improve and optimize signouts<sup>6</sup>

BIDMC has taken several steps to improve communication between PCPs and hospitalists on the internal medicine service. Attending physicians and medical residents are encouraged to telephone PCPs, on admission and on discharge. Direct conversation with a patient’s PCP allows an accepting physician to ask about allergies, medications, past medical history, and prior evaluation—information which patients may not relay accurately. Similarly, a phone call at discharge allows the hospitalist to provide the PCP with an overview of major tests performed and diagnoses made during the hospitalization, changes made to the medication list, and follow-up plans.

When a patient is discharged from BIDMC, a medical student or resident familiar with that patient is responsible for drafting a discharge summary to be reviewed and edited by an attending physician. BIDMC has focused efforts on improving the quality of discharge summaries, providing house staff education and a discharge summary template to incoming medical residents. In addition, the name and contact information of a patient’s PCP is kept on file in the electronic medical record; once completed, the discharge summary is automatically faxed to the PCP.

Researchers have remarked that, historically, “the discharge summary has been found to be poorly written, contain inaccurate or ineffective communication, and received too late to be of any significant value.”<sup>7</sup> Despite the efforts taken to improve the quality and timeliness of discharge summaries at BIDMC, the hospital medicine program has taken an additional step to improve communication with PCPs. In collaboration with the information systems department, BIDMC hospitalists created an automated hospitalist fax. With the click of a button, the hospitalist can generate a letter automatically populated with:

- the name and contact information of the PCP,
- the date of admission and date of discharge,
- primary and secondary diagnoses (obtained from the discharge worksheet filled out by providers during the hospitalization),

...recent studies have emphasized that less than half of all PCPs are provided information about the discharge medications and plans for their recently hospitalized patients.<sup>4</sup> These “fumbled handoffs” represent a significant challenge to patient safety.<sup>5</sup>

- the discharge medications (which are pulled from the patient’s electronic order entry),
- follow-up appointments that have been scheduled at BIDMC (taken from the online medical record), and
- the contact information of the discharge hospitalist.

Each field can be edited. In addition, hospitalists are encouraged to add one or two paragraphs of free text to briefly describe the hospital course, major findings, and necessary follow-up. These letters are automatically faxed to the PCP; a hospital medicine administrator also sends out a paper copy as a backup.

Hospitalists and PCPs recognize the significant risk for communication failure, particularly at the time of hospital admission and hospital discharge. The use of simple communication tools, structured methods of communication, and information systems can improve the handoff of information from one provider to another. ■

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## The Hospitalist-to-Hospitalist Handoff

With the threshold for hospitalization ever increasing, those patients who **are** admitted tend to require that multiple medical and nursing consultants be involved in their care. An increased number of providers means many more handoffs both between providers of different disciplines, and between providers within their own disciplines. One study has found that 26 percent of adverse events occur during physician cross-coverage of one another.<sup>1</sup> An understanding of the importance of effective intradiscipline communication is essential for high quality patient care. This is especially true for hospitalists.

While the expanding role of hospitalists in American hospitals brought the opportunity for more timely and focused inpatient care, the opportunity for communication challenges have also expanded. Inherently, the complex hospitalist model of care requires multiple hospitalist-to-hospitalist handoffs. For those exchanges to be effective, each must, at a minimum, contain:

- patient identifiers: name, age, date of birth, medical record number;
- names of the patient’s other inpatient and outpatient providers;
- information regarding health care proxy and advance directives;
- a problem list;
- hospital course and current active issues; and
- medication doses, schedules, and allergies.

Handoffs between hospitalists ideally involve both an oral and a written exchange of information. The oral handoff allows participants to highlight not only important pieces of information, but also information which is subtle and less clearly transmitted in written form. The exchange of written information complements the oral discussion for both parties. The act of writing a handoff allows the transmitting hospitalist enough time to provide complete and thorough information. And, with a written handoff in hand, the receiving hospitalist can listen and ask questions with greater attention than if distracted by voluminous note taking. A written handoff also provides the receiving hospitalist a mechanism by which to review the transmitted information at a later time when the information may be necessary for patient care.

In many hospitals with electronic medical systems, typed handoffs have supplanted written handoffs. Electronic handoffs have several additional potential advantages over written handoffs. They allow participants to edit the handoff in an efficient manner while diminishing any concern for transcription error. Unlike most written handoffs, electronic handoffs can also be saved and can contribute information to an electronic medical record.

—JL, AC

#### Note

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## A Process Prone to Error and Needing Improvement

by Steven Van Dam, MD

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The transfer of a patient's care from one clinician to another is commonly referred to as the "handoff" and is an obvious example of a process which is prone to error and needing of improvement. The scope of the issue is enormous. Handoffs occur between nurses, between physicians, between primary physicians and covering physicians, between anesthesiologists and PACU nurses, and many more sets of transmitters and receivers. Certainly, the increasing use of hospitalists will raise the number of handoffs for primary care physicians, and the movement toward fewer hours on-call for residents means their number of patient information exchanges grows as well.<sup>1</sup> Each handoff, unfortunately, represents a point of potential error or omission in communication. Thus, any system or method designed to improve the handoff process has a wide potential scope of use.

As physicians collaborate with hospitalists and are, in turn, handing off patients to covering physicians more often, the handoff process requires a more stringent evaluation than ever before. My observation suggests the handoff process in this setting is, often, passive and electronic. The physician assuming the care of the patient simply reviews the electronic medical record to acquire the necessary information. For this reason, it is vitally important that the data in these electronic formats be maintained accurately and updated frequently. Even better, one should strongly consider a required oral handoff within the coverage group, a method certain to be more informative and accurate.

### Case in Point

The case example on [Page 2](#) demonstrates the serious outcomes related to handoff errors. Had this particular surgical service used a more formal face-to-face handoff process, or if it had had technology available for a more comprehensive handoff process, perhaps the information regarding the patient's chronic medical condition would not have been lost and the unfortunate outcome could have been prevented.

In the world of aviation, the handoff of airplanes on a radar screen from one air traffic controller to another is standardized, practiced, and handled as a serious maneuver—as it should be, considering the potential consequences of a bad handoff between controllers. In fact, the handoff itself is part of an air traffic controllers training and re-training. Isn't it surprising that—given the potential consequences of a botched patient handoff—most physicians have never been trained in a formal or standardized handoff process?

### Barriers to the Effective Handoff

By reviewing the literature on patient handoffs, and evaluating the handoff process at one academic medical center, Solet et al identified four major barriers to effective handoffs: 1) the physical setting, 2) the social setting, 3) language barriers, and 4) communication barriers. The authors concluded 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.<sup>2</sup>

This information is helpful as a tool to measure the effectiveness of a handoff system. One might conclude that a handoff system designed to address any or all of these four deficiencies is likely to improve the communication process and might reduce errors. For example, such measurement might be applied to the following handoff methods currently in place at North Shore Medical Center.

### The Oral Handoff

An oral handoff is a spoken exchange of patient information from the clinician relinquishing responsibility for the patient to the clinician assuming that responsibility. While the classic oral handoff might, at first glance, seem simple and unworthy of discussion, the information can be complex and a systemized approach can ensure that the proper information is communicated.

Vidarthi et al, at the University of San Francisco and the University of Chicago, developed an oral handoff format they dubbed ANTIC-ipate.<sup>3</sup> The acronym refers to:

**A**dministrative information: e.g., patient name and location

**N**ew information: clinical update featuring the current physical exam, especially cardiopulmonary and cognitive status

**T**asks: preferably in an if-then format: "if hematocrit=x, then transfuse"

**I**s the patient sick? An assessment of the severity of illness

**C**ontingency planning and code status

Acronyms pervade medical communication. Physicians are readily familiar with the SOAP note to structure daily progress notes in the medical record; ANTIC uses a similar structure for ensuring that handoff communication is complete, structured, and predictable.

### Electronic Handoff

As computer database and patient tracking systems become more popular, one might consider utilizing the same systems for handoffs. While the benefit of discussing a patient face-to-face is missing, the organized storage of information in a computer database can be useful. Several software companies produce patient tracking systems that can support handoffs by streamlining the communication of tasks related to the care of patients. One enables providers to maintain a list of tasks related to the care of each patient, and each task can be marked as, “public” or “private” to control the sharing of tasks.<sup>4</sup> Other electronic options for patient handoffs include e-mail, shared spreadsheets, and other database software.

### Audio Taped Handoffs

Common in the nursing environment, audiotaped handoffs combine the benefit of the oral handoff without the practical constraints of meeting at a specific place or time. At North Shore Medical Center (NSMC), some nursing units are using audiotapes to share patient information. The nurses point out that by listening to tapes left behind, rather than meeting face-to-face, they avoid moving through the process too quickly. On these units, the nurse reporter tapes a report 30 minutes before the shift ends. When the oncoming nurse has finished listening to the taped report, the reporter is available to answer any questions and to provide any interim updates. Physician groups currently using electronic handoff methods who feel that information is lost in that format might consider this method as an alternative. ■

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- 4 See [www.patientkeeper.com](http://www.patientkeeper.com)

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# Partners HealthCare Clinical Transitions Project

by Terrence A. O'Malley, MD; Eric Poon, MD; Carmen Varga-Sen; and Myrna Chan-MacRae

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A growing body of research confirms the risks that patients encounter whenever their care transfers to another clinician. In 2002, Partners HealthCare Systems (PHS) convened a "Handoff Committee" to develop a network-wide strategy to improve the frequency with which essential clinical data were available to the receiving clinician. The committee has focused on transfers of adult patients from the PHS acute care hospitals to inpatient rehabilitation, skilled nursing facilities (SNFs), and home care agencies (see Figure 1). The goal is 100 percent of all essential clinical information for 100 percent of the patients transferred to these facilities.

The decision to focus on this group of patients, rather than on all clinical transitions, was the result of three considerations: 1) these patients are at high risk because of their medical complexity, 2) this complexity translates into significant time-value for the essential clinical information—such that failure to provide it enhances this risk; and 3) these transfers account for one-third of all discharges from PHS hospitals, so the volume is significant but not as overwhelming as attempting to intervene on all transitions. We also assumed that any improvement we could make on "acute to non-acute" transfers would spill over into all other discharges as well.

The handoff committee has developed a list of clinical data elements that the receiving clinician requires to provide safe care for the first 72 hours after transfer. Why 72 hours? That represents the time between a patient's arrival in the facility

Table 1

Required Elements for Every Patient	
Focused history	Procedures
Focused physical exam	Hospital course
Pertinent past medical history	Pertinent test results
Pre-admission medications	Future care plans
Allergies	Results pending that require follow-up
Medication reactions/drug intolerances	Name/number of discharging physician & PCP
All significant clinical conditions	Discharge medications with diagnoses

on a Friday evening and the time when the patient's previous caretakers would return from their weekend off and be able to provide any essential information that was not included in the transfer packet. By limiting the time frame, we were able to more easily separate data elements that would be "helpful" from those that are *essential* to the patient's care, comfort, and safety.

The result of the handoff committee's deliberations is a list of 14 items, which mirror the Joint Commission required elements and apply to every patient (Table 1), and data sets for 30 specific clinical issues and medications that are expected to be present if applicable to the patient (Table 2). Each of these data sets contains between three and seven elements. These items are the basis for an ongoing quality improvement project with these five components:

1. assessment of discharge packets by receiving clinicians at 25 post-acute facilities and Partners Home Care to ascertain how many contained the essential data elements,
2. analysis of those data,
3. feedback to multidisciplinary teams at each acute care facility charged with improving performance,
4. re-measurement after rapid cycle interventions, and
5. quarterly reporting of the defect-free rate for each facility to the network and acute care hospital leadership.

This last component provides an essential internal benchmark for an issue lacking national performance standards. We measure performance on all items, and report performance on 12 of them (Table 3). Performance on each of these 12 items has improved across the network since Partners implemented this program.

## A Good Example

Warfarin management is a good example of the effectiveness of this approach. The essential clinical data required are: indication, duration, target INR, last three INRs, last three warfarin doses, and who will be responsible for adjusting the dose. In the initial survey (in 2002), fewer than one of every five patients

Figure 1: Potential Handoffs

From \ To	Acute Hospital	Rehab Hospital	Skilled Nursing Facility	Home Care	Home
Acute Hospital		●	●	●	
Rehab Hospital					
Skilled Nursing Facility					
Home Care					
Home					



Table 2

Condition-specific Data Sets Expected to be Present if Applicable		
Acute coronary syndrome	Benzodiazepine	Narcotics
Advance directives	Cardiac surgery	Neurosurgery
AF	CHF	Nutrition
Amiodarone	Competency issues	Orthopedic procedures
Antibiotic	Endocarditis	Stroke
Anticoagulant	ESRD	Swallowing impairment
Anticoagulation	Foley catheter	TPN
Antipsychotic	Investigational drug	Tracheostomy
Arrhythmia	Isolation issues	Trauma-direct admit
Behavioral issues	Limitations on activities	Venous access

on warfarin transferred with all of this information, and four of five patients were missing one or more of these items. Currently, greater than four of five discharge packets contain all essential warfarin data.

Improvements in the other items have also occurred. As of the last reporting period, the entire network is at 90 percent or better on physician contact, procedures, hospital course, warfarin indication, and target INR. Five of six hospitals are at 90 percent or better for allergies.

With ample room for improvement, Partners has targeted house staff education as a major strategy for improving performance given the high percentage of discharge summaries they produced. Several interventions have recently started. Some house staff are reviewing discharge packets and scoring them for completeness. The goal is to incorporate discharge summary review as part of the teaching curriculum. Partners has also developed a draft tutorial for use by the house staff who review the elements of a good discharge summary.<sup>1</sup> Training program directors are providing feedback (and reader feedback would be appreciated).

This program has successfully improved performance across the Partners network and has resulted in the transmission of more complete medical information. We believe that clinical transitions will become the subject of increasing national attention as we all continue to look for ways to make patient care safer. ■

#### Note

1. See [www.partnerstransitions.org](http://www.partnerstransitions.org) for the tutorial and the discharge review survey.

Table 3

Data Elements Used to Report to the Hospital Leadership
<p><b>Physician Contact—Contact at Acute Facility</b></p> <p>Name of the discharging physician</p> <p>Rationale: direct contact may be necessary with the discharging physician or members of the care team if the discharge packet has inadequate information.</p>
<p><b>Procedures</b></p> <p>Names of major procedures performed (if relevant)</p> <p>Rationale: Joint Commission required element.</p>
<p><b>Hospital Course</b></p> <p>Treatment rendered</p> <p>Response to treatment</p> <p>Rationale: Joint Commission required elements.</p>
<p><b>Pre-Admission Medication List</b></p> <p>Pre-admission medications</p> <p>Rationale: required for medication reconciliation.</p>
<p><b>Discharge Medication List</b></p> <p>Discharge medications from acute care facility</p> <p>Rationale: required for medication reconciliation and for patient safety.</p> <p>Joint Commission required element.</p>
<p><b>Allergies</b></p> <p>Drug allergies, intolerances, or adverse drug reactions.</p> <p>Rationale: required for patient safety. Joint Commission required element.</p>
<p><b>Follow-up Plan</b></p> <p>Follow-up plan (including the name of physician who will follow-up, an approximate time-frame for follow-up, and a statement of any unique/special issues that require follow-up)</p> <p>Rationale: Joint Commission required element.</p>
<p><b>Anticoagulation—Warfarin Management</b></p> <p>Physician Contact—Contact at Acute Facility</p> <p>Specific indication for Warfarin therapy</p> <p>Target INR</p> <p>Last three INRs and Last three Warfarin doses</p> <p>Rationale: patient safety, optimal management of a high risk medication.</p>

# Utilizing EMR Features to Improve Handoffs

by Douglas Bonacum, MBA, CPHRM; and Kenneth T. Fong, MS

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Most primary care physicians practice in systems in which patients are (sometimes) poor informants, multiple handoffs occur, information gaps are the norm, and the diagnostic and treatment processes are at risk. For even the most stellar practitioners, communication failure is inevitable, but patient harm need not be. The electronic medical record provides a number of useful features that can help prevent errors and mitigate those that do happen before substantial harm is incurred.

Diagnostic errors that result in patient harm typically stem from multiple breakdowns of both individual and system factors. Awareness of the most common types of these breakdowns and factors helps to identify and prioritize strategies to minimize diagnostic errors. One particular opportunity to improve the timeliness and reliability of diagnoses is at the handoff of critical patient information from one clinician to another.

## Common Breakdowns

In a study analyzing 181 malpractice claims related to missed and delayed diagnosis, Gandhi et al found that the most common breakdowns in the diagnostic process were, generally:

- failure to order an appropriate diagnostic test,
- failure to create a proper follow-up plan,
- failure to obtain an adequate history or perform an adequate physical examination, and
- incorrect interpretation of diagnostic tests.<sup>1</sup>

For clinicians, the top contributing factors were failures in judgment, vigilance, memory, knowledge, and handoffs.<sup>2</sup>

A review of more than 100 articles in the literature describing delay and failure to diagnose reveals a deep-seated belief that the problem is largely cognitive (i.e., inadequate assessment, including judgment and decision making).<sup>3</sup> However, while the recommendations associated with these diagnostic error articles are often more focused on systemic issues than on individual practitioner performance, organizations tend to focus on the individual practitioner issues.<sup>4</sup> Individual shortcomings are more obvious and, perhaps, considered easier to address (e.g., remedial education is ordered; focused reviews are conducted). Systemic remedies, on the other hand, tend to largely reside at the “Policy and Procedure” level and face tougher odds in effecting change in system performance.

Multifactorial diagnostic errors require a multifactorial response. Finding effective ways to reduce diagnostic errors can begin with the recognition that it “takes a village” to make many diagnoses today. Beginning with the history and physical, all the way through the ordering and conducting of diagnostic labs

and tests, referrals, informal consults, and implementation of follow-up plans, multiple parties are engaged in the process. For example, in the Gandhi study, two or more clinicians contributed to the missed diagnosis in almost half of the cases (and, obviously, the patient and/or family were participants in the process in every single case). In short, while virtually all diagnostic errors are linked to cognitive factors, the error chain is much more complex than that. The solutions will also be complex.

## Recommendations

Appropriate utilization of specific features of the electronic medical record (see Table) may enhance the timeliness and reliability of diagnoses, by providing a valuable level of redundancy into the workflow, without unnecessarily contributing to the practitioners’ time pressures.

The EMR features described in this table are not necessarily meant to replace existing effective practices, but to help make them even more reliable. Several of them can be triggered by predetermined and explicit characteristics of the clinical encounter, and all of them can be used on a trial basis to determine what works best for your practice. We may never have sufficient evidence to fully know whether these are part of the “best” solution set for improving the safety and reliability of diagnoses, but for every patient we save from avoidable harm because of it, the evidence will speak for itself.

## Nurse Handoffs at Shift Changes

The EMR’s streamlining and standardization capabilities promotes reliability of communications between nurses at particularly vulnerable times (e.g., during shift changes). Standardized patient information, including critical information like alerts for high-risk medications and past history of falls, can be integrated into the shift change workflow so that it is shared and received by nurses in a consistent way.

The focus on nursing communications provides additional assurance that all team members (not just physicians) possess critical patient information and follow up plans.

## Notes

- 1 Gandhi TK, Kachalia A, Thomas, EJ, et al. Missed and delayed diagnoses in the ambulatory setting: a study of closed malpractice claims *Ann Intern Med.* 2006; 145 (7):488–96.
- 2 The patient-related factors included non-adherence, atypical clinical presentation, and complicated medical history.
- 3 Conversation with Kaiser Permanente National Risk Management Department.
- 4 For example, strategies to combat radiographic misinterpretation by ED physicians could include rapid expert review within specified time frames and specific follow-up action plans where interpretations are meaningfully different.
- 5 The name of these features may vary depending on the EMR product.



EMR Feature <sup>5</sup>	Description	Impact on Reliability of Diagnosis
<b>Overdue results notification for certain key clinical tests</b>	Notify the practitioner (or practice manager) about tests that were ordered but not completed. Some systems enable the ordering MD to indicate for which orders they would like to receive overdue results messages.	Reduces reliance on memory. Among the numerous reasons why ordered tests are not done are miscommunication, misunderstanding, and access challenges, all of which are difficult to defend against allegations of a missed or delayed diagnosis.
<b>Patient online access to lab results</b>	Patients view lab results online.	Engages the patient as an active partner in care and provides a level of redundancy to existing results management system, making it harder to "do the wrong thing."
<b>After-visit summary</b>	Report (for patients) that includes instructions and follow up actions.	Engages the patient as an active partner in care and promotes adherence to follow-up plans and orders for referrals.
<b>Abnormal results in in-basket</b>	Flag "abnormal results" based on practitioner consensus and establishment of particular lab/test values.	Makes it "easier to do the right thing" by focusing provider's attention on lab/test results that may require higher priority.
<b>Tickler functionality</b>	Practitioners send themselves messages to track certain patients. Messages can be sent immediately or scheduled for a later date/time.	Reduces reliance on memory and integrates a reminder reliable mechanism into workflow for items/issues providers and patients cannot afford to miss.
<b>Virtual consult</b>	Immediate consulting MD access to relevant clinical information, including test results. Consulting MD can formally document his/her opinion in the EMR.	Promotes an easier way for physicians to conduct consultations. Expedites information access among physician colleagues for internal consulting purposes.

# The Patient's Role in Handoffs

by Deborah LaValley, BSN, RN, CPHQ, Senior Loss Prevention Specialist, CRICO/RMF

No one discipline (physician, nurse, technician, or patient, etc.) can possibly maintain total awareness of a patient's care needs in order to avoid all adverse events. Good care truly needs to be a team effort and, when possible, the patient needs to be an active part of the team. To that end, when information about a patient is being exchanged among clinicians, the patient needs to listen and be heard.

Within the last few years, the health care industry has also begun to encourage patients to take a more active role in their health care by reinforcing their need to ask questions and speak up when they have concerns. In March 2002, the Joint Commission and the Centers for Medicare and Medicaid Services (CMS), together, launched a national program to urge patients to take an active role in preventing health care errors. When patients and their families become members of the health care team, they also become a party to many of the information handoffs involved in their care and, in effect, safeguards in the system: a reminder to caregivers to recheck or validate that the right thing is being done.<sup>1</sup>

Before the patient's role in handoffs can truly be successful, the culture of health care must change. Health care professionals must believe that patients have an important role in reducing mistakes.<sup>1</sup> For example, the Council on Graduate Medical Education (COGME) and the National Advisory Council on Nurse Education and Practice issued a joint report stating that physicians and nurses "will have to adjust their own practice approaches to encourage patients to become educated and to participate in their own health care."<sup>1</sup>

Time and patience may influence the quality of a practitioner's response to a patient's questions, concerns, and feedback. The practitioner's ability to listen and provide explanations and answers in a way that the patient, or his/her family, can understand frequently falls short. Many physicians are unaware that their communications with patients are often too cryptic or too complex.<sup>2</sup>

Patients want to be listened to and respected for their opinions. They are frequently asked to speak up when they have a concern, but may not have been given enough information to understand what is happening to them. Patients cannot effectively assist in the prevention of adverse events without knowing their health status or understanding the health care processes involved in their diagnosis and treatment.<sup>1</sup>

A patient's ability to affectively communicate with caregivers can be further complicated by his or her:

- age;
- health status;
- preoccupation with issues at home, work, finances;
- fear of offending their health care providers or being viewed as too demanding;
- denial that anything bad could happen to them;
- expectation that the people caring for them hold this responsibility;
- education, literacy, and language; and
- cultural factors related to manners and authority.<sup>1</sup>

Clinicians encouraging patient participation in information handoffs might consider the following:

- use your position: patients will, generally, respond to a respected caregiver's invitation to help and ask questions;
- provide interpreter services as needed;
- provide an adequate setting and time for the patient to share information and ask questions;
- avoid appearing defensive;
- explain what you are doing, why, and what the patient should expect;
- confirm what the patient has conveyed to you, or that you have answered the question he or she asked;
- ask the patient to explain back to you important information, clarify any misunderstandings.<sup>1</sup>

The belief that health care providers should always have sufficient knowledge and skills to prevent mistakes—to function as the sole guardians of safety—remains pervasive, even if it is unrealistic. The expectation that all patients will be active participants in their care is equally naïve. Both, however, are goals worth pursuing. ■

## Notes and References

- 1 Spath PL, Nash DB. *Partnering with Patients to Reduce Medical Errors*. Chicago: American Hospital Association, 2004
- 2 See: "How Literacy and Communication Initiatives Improve Patient Safety." Volume 8, Number 3, 2005. [<http://www.npsf.org/download/Focus2005Vol8No3.pdf>]

# Additional Resources

by Judith Jaffe, MSLIS, Knowledge Manager, CRICO/RMF.

*The following additional resources related to handoffs were selected from the PubMed (Medline) database of indexed biomedical literature published from 2000 through 2006.*

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## Lessons from Industry

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Van Eaton EG, Horvath KD, Lober WB, Pellegrini CA. Organizing the transfer of patient care information: the development of a computerized resident sign-out system. *Surgery.* 2004;136:5-13.

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JCAHO's 2006 National Patient Safety Goals: handoffs are biggest challenge. *Hosp Peer Rev.* 2005;30(7):89-93.

## Surgery

An outline for handoffs in surgery. *OR Manager.* 2005;21(8):9-10.





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