

Handoffs: Reducing Harm Through High Reliability and Inter-Professional Communication

11

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Chapter Objectives

- Define handoffs, and review common areas where lapses in communication can lead to patient harm.
- Summarize the history of handoffs in graduate medical education.
- Explore standardized handoff models for written and verbal communication.
- Identify strategies for implementation of effective handoffs for interprofessional teams.

Introduction

Optimal continuity of care between patients and providers requires a strong foundation in communication. With increases in transitions of care, structured communication has become integral in the education of all healthcare providers to improve patient safety. This education has been primarily focused on provider types as distinct disciplines and specialties; however, patients intersect multiple provider types when accessing medical care, thus emphasizing the need for a collaborative inter-professional approach.

Miscommunication Can Lead to Adverse Events

No matter one's discipline, providers must make effective communication a dedicated practice. Lapses in communication due to incomplete, inaccurate, or omitted information are leading causes of adverse events, including sentinel events [1]. Up to two-thirds of sentinel events have been linked to inadequate communication, of which half were attributed to poor transitions of care between providers [2] (Key Points Box 11.1).

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Key Points Box 11.1

Miscommunications can occur when the information delivered is as follows [1]:

- 1. Inaccurate
- 2. Incomplete
- 3. Not timely
- 4. Misinterpreted
- 5. Not required

Defining Handoffs

The vulnerable state that transitions of patient care pose can be mitigated by conducting handoffs. Handoffs, also referred to as handovers or
sign-out, involve the process of transfer and
acceptance of patient care information and
responsibility from one provider to another [3–
5]. Providers may include a range of healthcare
workers, such as physicians, nurses, and advanced
practice providers (Key Points Box 11.2).

Key Points Box 11.2

Handoffs involve the process of transfer and acceptance of patient care information and responsibility from one provider to another [3–5].

Handoffs characteristically involve two roles: the sender and receiver. The sender transmits patient information and releases patient care to the receiver who receives the patient information and assumes responsibility of the patient. Ideally, this exchange of information occurs face to face. Both roles should demonstrate active listening and participation; handoffs should allow opportunity for discussion and clarification of information [6]. Active listening, paired with the fresh perspective of the receiver, has been shown to reduce fixation errors [5]. The overarching goal is for both the sender and receiver to develop a shared mental model, "the perception of, understanding of, or knowledge about a situation or process that is shared among team members through communication" [7] (Fig. 11.1).

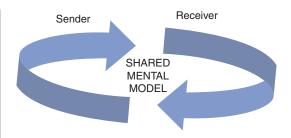


Fig. 11.1 Creation of a shared mental model between sender and receiver

Table 11.1 Examples of handoffs by location and provider type

Type	Provider		
Shift change	Physician to physician or nurse to		
	nurse		
Temporary	Nursing coverage for a break or a		
coverage	surgical technician scrubbing out		
	during a surgical case		
Across staffing	Primary care provider to an on-call		
	provider		
Across	Anesthesiologist to surgeon		
specialties			
Across settings/	Emergency department to intensive		
organizations	care unit		
Provider types	Healthcare provider to caregiver at		
• •	a nursing home facility		

Handoffs Throughout the Hospital

There are a wide variety of handoffs that occur during a hospitalization, and each one has the potential for errors and communication deficits. Handoffs occur between a variety of professionals – between those in the same profession, such as nurse to nurse during shift change, as well as inter-professional handoffs between different professional types, such as nurse to radiology technician, and inter-unit handoffs (i.e., operating room (OR) staff to intensive care unit (ICU) staff) (see Table 11.1).

The wide variety of handoffs are important to recognize as the language of medicine is the same across healthcare professionals, but the communication priorities may vary between provider types. For instance, what is prioritized in a nurse-to-nurse handoff (e.g., reviewing orders, wound care specifics, intravenous line flushes) varies from what is prioritized in physician-to-

physician handoffs (e.g., information about diagnoses and specific treatment goals/plans). As expected, there is variation in the information provided based on provider workflow and responsibilities.

Walking through a hospitalization for a patient may help demonstrate possible points of communication vulnerability.

Vignette 11.1

Jessica is a 15-year-old female, with a history of asthma, who was in her usual state of health until she developed fever, worsening cough, and increased work of breathing in the setting of a 1-week history of cough and runny nose. She has had poor oral intake and a physical exam that is notable for crackles over the left lower lung field. She has a fever and an oxygen saturation of 100%. Jessica is admitted for community-acquired pneumonia with concern for dehydration. She is started on empiric intravenous (IV) antibiotics.

For Jessica, the patient in the case, the first handoff occurs between the physicians and nurses in the emergency department and the inpatient physician and nursing staff. At this juncture, it is critical to communicate where the patient is in the course of their management, e.g., when/which medication doses were last given, what testing has been completed, and what treatments are outstanding or need to be followed up. Ideally, all data (e.g., lab results) are available to all providers via the electronic health record (EHR). However, delays in charting due to competing priorities may result in the lack of a shared mental model, thereby leading to duplication of therapies or delays in care.

Vignette 11.2

Jessica is admitted to the inpatient unit, where she is examined by the nursing and physician teams. She is given IV fluids with continuation of the antibiotics that were started in the emergency department. Over the course of her first day of hospitalization, she develops increased work of breathing, pain in her chest, and a slow drop in oxygen saturation to 90%. She is started on supplemental oxygen by nasal cannula.

Once a patient is admitted, and the results of the testing, therapeutic interventions, and the physician and nurse assessments are complete, a plan of care is created by the inpatient unit team. In many hospitals, nurses and physicians who care for hospitalized patients provide care during scheduled shifts. Thus, nurses and physicians handoff patient care to the providers on the next shift (e.g., the day shift hands off to the night shift). Notably, nursing handoffs have evolved over time to include bedside handoffs which incorporate the patient and or family [8]. This practice provides a patient-centered approach to care by incorporating the input of the patients and their families and ensuring they are aware of and in agreement with treatment plans and procedures. As mentioned previously, nursing handoffs have a different focus than physician handoffs, and both are equally important to patient care. Ideally, a shared mental model is achieved with agreement between provider types for the severity of illness, plan of care, action items, and contingency plans for the next shift.

Vignette 11.3

Due to Jessica's worsening condition, the decision is made to obtain a chest X-ray in the radiology suite.

The next handoffs for Jessica are between the inpatient medical team and the radiology team. Nursing must provide adequate information regarding the patient's condition to alert the radiology staff to possible issues with procedures: primary medical problem (e.g., pneumonia), per-

tinent medical history (e.g., asthma), allergies, oxygen requirements, and sedation needs. It is critical that the team that is accepting the patient, no matter how briefly, be aware of the critical needs of the patient: Do they require oxygen? Do they have allergies to contrast?

Vignette 11.4

The chest X-ray reveals the previously noted pneumonia but now with a new parapneumonic effusion (infected fluid in the lung). Jessica continues to have increased work of breathing, fevers, and oxygen desaturation, requiring increased respiratory support. The decision is made to surgically drain the fluid collection in her lung.

If a surgical procedure is required during the hospitalization, several other handoffs must occur: First is a communication of the patient's history and diagnoses to the consultants – the surgeon as well as the anesthesiologists. Both consultants must be aware of issues that are specific to the patient (e.g., history of asthma), including information that will likely be present in the medical record such as diagnostic results, but again could be overlooked or not yet present in the medical record in urgent situations. For transitions of care such as these, it is most helpful to communicate a cogent patient summary, highlight the current diagnoses and pertinent past medical history, and discuss any intra-procedure needs (e.g., obtaining a specimen culture of the pleural fluid).

Vignette 11.5

Jessica has a left-sided chest tube placed without complication. Postoperatively, she is transferred to the intensive care unit for further management.

Following the procedure, the events, findings, information regarding intraoperative medications, IV fluids, chest tube drains, and plans must

be communicated from the surgeons to the physicians who are caring for the patient after surgery. Similarly, the postanesthesia unit nurses must transfer information to the receiving intensive care unit nurses. Ideally, for areas such as the intensive care unit, this communication is face to face and with all members of the interprofessional team [9] (Key Points Box 11.3).

Key Points Box 11.3

The surgical team must communicate with the medical team how they would like the chest tube managed including parameters for removal. Delays in communication can result in adverse events and unnecessary utilization of resources, resulting in increased costs.

Vignette 11.6

Jessica makes a rapid recovery. On hospital day 4, the chest tube is discontinued, and she is transferred from the intensive care unit back to the general inpatient unit.

The transition between units is often typically between clinicians of the same type, e.g., physician to physician and nurse to nurse. The same procedures and protocols that apply to change of shift handoffs should be utilized with this transition as well, such as time of next scheduled medication dosing and wound care instructions for the chest tube site (Key Points Box 11.4).

Key Points Box 11.4

Handoffs from physician to physician should be timely and utilize the same framework and information that is required for inter-shift handoffs. If a patient who is transferred from the intensive care unit to the inpatient unit clinically deteriorates, the general inpatient team needs to be aware of the intensive care unit course and current clinical needs.

Jessica no longer requires supplemental oxygen and is able to take all medications by mouth. She is instructed to complete the course of antibiotics and to follow up with her primary care physician in 2 days.

Following the resolution of the illness that caused the admission, the patient must be readied for discharge. The final handoffs to occur in a hospitalization are from the hospital to the discharge location - whether that be home (where the receiver of the handoff is the primary care provider), a rehabilitation center, nursing home, or another hospital. Each of these locations requires a different type of communication, which must be timely, concise, and accurate. Delays in communication with primary care providers can result in the lack of appropriate follow-up or medical management, resulting in readmission. When handoffs are suboptimal, delays in treatment and adverse events can occur. Additionally, poor handoffs can impact patient and provider satisfaction, cause prolonged hospital stays, and contribute to increased cost of care [9].

Evolution of Handoffs

Despite the seemingly straightforward approach, high-quality handoffs are a complex process, and prior to the 2006 Joint Commission National Patient Safety Goal, handoffs were not formally taught nor required [1]. The complexity of handoffs is further elevated by the frequency of provider transitions, particularly in institutions that have medical trainees. Beginning in 2003, the Accreditation Council for Graduate Medical Education (ACGME) mandated a reduction in the length of time trainees could provide continuous care in the hospital, resulting in a substantial increase in change-of-shift transitions and ultimately the number of handoffs [10, 11]. Additionally, nurses are also vulnerable to prolonged shift durations. A study by Scott and colleagues showed that on average nurses work between 8 and 12 hours, and the risk of error nearly doubled when they worked 12.5 hours or more [12].

Transitions of Care and Graduate Medical Education

A large proportion of the most complex and ill patients in our healthcare system are cared for in institutions where physicians and other members of the healthcare workforce receive clinical training. This has a significant effect on the quality of handoffs in three ways.

Increased Frequency of Handoffs

Since the advent of the ACGME's work hour restrictions in 2003, hospital systems that utilize Graduate Medical Education (GME) trainees as their frontline workforce have been required to adapt their schedules. Restrictions in the number of hours worked per week and a decrease in the duration of shifts created condensed schedules with increased numbers of providers caring for each patient. Shifts that were previously 24 hours in length changed to 12-hour shifts, resulting in a dramatic surge in the number of handoffs between physicians. A typical teaching hospital might have up to 4000 individual patient handoffs occurring in the course of a day [1].

Lack of Standardized Training in Handoffs

Many physicians functioning as the faculty for graduate medical education trainees were not formally trained in the process of giving handoffs. Therefore, they lack knowledge of the standardized training curriculum for handoffs used in GME. Furthermore, faculty may lack competency in assessment and coaching of residents and fellows during observations of handoffs. While changing, many medical and nursing schools have not yet adopted a standardized curriculum and training of their students in provid-

ing effective handoffs, resulting in the burden of training falling on hospital systems that sponsor residency training [13].

Variable Clinical Experience of Providers

Without proper supervision, inexperienced physicians may not be capable of recognizing important clinical findings that could result in a delay in care or improper care of their patients. The hospital system is especially vulnerable at the time surrounding change of shift, which is now happening more frequently due to duty hour restrictions/shortened shift lengths. Written and verbal handoffs may be disorganized, unprioritized, or fail to paint an accurate picture of the patient's condition and needs. This potentially results in delays in care due to prolonged handoffs or "receiver fatigue" where critical clinical information is lost in a presentation filled with extraneous information.

In an effort to continuously improve the process of training future physicians and address the persistent lack of improvement in the quality and safety gaps surrounding patient care, the ACGME devised the Next Accreditation System (NAS) to include evaluation of the Clinical Learning Environment (CLER) of the hospital systems that are training residents and fellows. They identified six areas of focus during annual CLER visits, which include (1) identification and intervention in patient safety issues, (2) quality and performance improvement efforts, (3) supervision of trainees, (4) professionalism, (5) management of burnout and fatigue (resident wellness), and (6) transitions in care [14]. Many of the tenets of providing quality handoffs have been incorporated into the CLER evaluation process. Areas that are evaluated include the training of residents, fellows and faculty in a common clinical site-based process for handoffs, knowledge of transition of care policies among all physicians, presence of

efforts to assess and continually improve handoffs, and the participation of faculty, residents, fellows, inter-professional teams, and families in the handoffs process.

Strategies for Effective Handoffs

Avoiding communication failures during handoffs can be lessened by standardizing the content communicated between the sender and receiver in both verbal and written formats [1]. Handoffs can improve communication if the information is consistent and delivered in a predictable format. Critical information, such as illness severity, code status, vital signs, allergies, medications, pertinent events leading up to illness or hospitalization, ongoing assessment, pertinent diagnostic test results, plan of care with action items, and contingency plans, should be included in handoffs [1] (Key Points Box 11.5).

Key Points Box 11.5

Handoffs should include (1) illness severity, (2) code status, (3) vital signs, (4) allergies, (5) medications, (6) pertinent events leading up to illness/hospitalization, (7) ongoing assessment, (8) pertinent diagnostic test results, (9) action items, and (10) contingency plans [1].

Verbal handoffs should be timely, conducted face to face, and occur in a location that is free of excess noise and distraction. Written handoff tools complement the verbal handoff communication and facilitate opportunities for detail and for clarification when information is disparate. When possible, handoffs should include all members of the inter-professional team, which can promote ongoing discussion and ensure the maintenance of a shared mental model [15] (Fig. 11.2).

The right incation is:

- Quiet, free of distractions and nonemergent interruptions
- Consistent, same time, same place
- Protective of sensitive patient related informations as per the Health Insurance Portability and Accountability Act (HIPAA)

The right people include:

- All members of the inter-professional team involved in the patient's care; including patient and family
- Faculty educators at training programs who can perform workplace assessments and provide feedback on handoff quality

The right information is:

- Up to date and includes: current patient condition, treatments, concerns, and anticipated changes for the next shift
- Organized in a standardized format
- Transcribed using EHR tools to avoid errors

Fig. 11.2 The "rights" of effective handoffs [1]

The right style of communications is:

- Face to face
- Provided in both verbal and written form
- Conducive to questions and opportunities for clarification
- Focused on the creation of a shared mental model

Handoff Models

There are several handoff mnemonic models used to structure both written and verbal handoffs (see Table 11.2 for examples). One commonly used mnemonic is SBAR, which stands for Situation, Background, Assessment, and Recommendation. SBAR is a handoff communication tool developed by the US Navy and has since been adopted in many healthcare settings and is most frequently used by nurses. SBAR was designed to communicate urgent patient information in a relatively quick manner [2].

An extensively studied model, the I-PASS Handoff program, uses the organizational framework of a mnemonic as an anchor for an interventional bundle that includes strategies for team communication. The I-PASS Handoff program includes seven core elements: (1) the I-PASS mnemonic (I = illness severity, P = patient summary, A = action list, S = situation awareness and contingency planning, and S =synthesis by receiver), (2) a workshop for teaching team communication through the use of TeamSTEPPs and handoff techniques, (3) skills training through simulation and role-playing exercises, (4) independent study module, (5) faculty development, (6) a direct observation tool for feedback, and (7) campaign for adoption and sustaining practice. This study demonstrated a reduction in preventable adverse events by 30% and medical errors by 23% when imple-

Table 11.2 Handoff mnemonics examples [1, 16]

ISBAR	<i>I</i> dentify		
	Situation		
	Background		
	Assessment		
	Recommendations		
SIGNOUT	Sick/do not resuscitate		
	Identifying data		
	General hospital course		
	New events of the day		
	Overall health status		
	Upcoming possibilities/plan		
	Tasks to complete		
HANDOFFS	Hospital location		
	Allergies/adverse reactions		
	Name		
	Do not attempt to resuscitate		
	Ongoing medical problems		
	Facts about hospitalization		
	Follow-up		
	Scenarios		
PSYCH	Patient information/background		
	Situation leading to hospital course		
	Your assessment		
	Clinical information		
	Hindrance to discharge		

mented by nine children's hospital [17]. The I-PASS Handoff program has since been adopted by more than 50 hospitals, studied in many iterations and is frequently referred to as the gold standard for effective handoff communication between physicians [1, 12]. It has also been adapted effectively for nursing shift report across varied clinical settings [18] (see Table 11.3) (see Fig. 11.3).

I	Illness severity	Alerts the receiver to the patient clinical status: stable, watcher, or unstable			
P	Patient summary	Provides an overview of the patient's pertinent past medical history, events lead up to hospitalization, and interim hospital course			
A	Action list	Tasks that require completion for the next shift			
S	Situation awareness and contingency planning	Preparatory considerations for a change in clinical status. Should be relayed in "if, then" statements			
S	Synthesis by receiver	Opportunity for clarification and inquiry to ensure shared mental model between sender and receiver			

Table 11.3 The I-PASS handoff model with overview of elements [17]

	I	P	A	S	S
	S	Patient Summary Statement & Problem Based	Action List	Situation	Synthesis
	w	Hospital Course		Awar eness/Contingency	by
	U			Planning	Receiver
Bed 15-year-old F 124 Allergies: none Weight: 56kg Access: Peripheral IV	w	Summary: 15-year-old female with past medical history of asthma, now with left lower lobe pneumonia complicated by dehydration and increased respiratory distress with supplemental oxygen requirement. 1. Pneumonia: - Ampicillin IV every 6 hours - Oxygen via nasal cannula; 3 liters/min 2. Dehydration - IV fluids; 100mL/hr	[] Obtain Chest x-ray [] Monitor urinary output	If evidence of pleural effusion (fluid collection) on chest x-ray, then obtain surgical consultation for chest tube placement	

Fig. 11.3 Example of written/printed handoff tool using the I-PASS model

Implementing and Sustaining Effective Handoff Programs

Implementation of a standardized handoff system requires support from hospital administrative leadership for the rollout of the program, educational efforts, time needed to train staff, and, most importantly, resources needed to provide workplace-based assessments with feedback to achieve the desired behavior change. Dedicated time and physical space for handoffs are also important. New space may be needed to have a quiet, uninterrupted discussion, and it may be necessary to have extra staff to cover patient needs while handoffs are occurring.

Information such as accurate weights, allergies, code status, and location are critical to all handoffs. Integration of the EHR for a printed/written handoff tool that supplements/supports verbal communication allows for seamless information transfer and avoidance of transcription errors. Nursing and physician handoff written documentation differ in various aspects of focus,

with physician handoffs being more related to contingency plans and action items, while nursing handoffs focus on different action items that include when medications are to be given, fluid intake and output, activities of daily living, and pain management (pain scales and PCA (patient-controlled analgesia) orders). There is common ground between nursing and physician written handoff elements. A Continuity of Care Document is a potential EHR-based framework to support the supplemental written document for use in handoffs by multiple provider types [19].

Once a handoff system is established in a hospital, it will need ongoing evaluation and support using a continuous improvement approach to keep the process at the front of the clinicians' minds and prevent attrition of adherence to standard handoff protocol. Sustaining quality improvement efforts is difficult in any setting and often more challenging in the healthcare setting. Fryman and colleagues outlined the use of quality improvement cycles involving direct observation of handoffs, and audits of the use of the

written handoff tools from the EHR demonstrated success in sustaining change in their system [20].

Future Direction of Inter-Professional Handoffs

The Joint Commission and the CLER standards specifically mention inter-professional handoffs as a future standard. Calling for the development of interdisciplinary handoffs between obstetrics and neonatology physicians, Vanderbilt and colleagues described how a common handoff would greatly benefit the neonate and mother's health and outcomes [3]. There has not been a significant amount of research on this topic in the literature, but Kostoff and colleagues showed improvement in pharmacy students' perception of inter-professional competence by using the SBAR format for communication between pharmacists and other disciplines [2]. Similarly, Solan and colleagues demonstrated that multidisciplinary handoffs involving residents and charge nurses improved perceptions of communication [21]. The gold standard for communication at transitions of care would include training entire hospital systems to perform handoffs in a standardized, highly reliable fashion, with sharing of information via an EHRgenerated handoff document to support the verbal communication.

Summary

Handoffs provide a unique opportunity to enhance inter-professional communication. Given the increased frequency in which patients intersect different healthcare providers across disciplines, settings, and organizations, deliberate education in structured communication is essential to patient safety. There are several standardized frameworks, such as I-PASS, that can be used to structure both written and verbal handoffs. No matter what framework is used, it is important to maintain anchoring elements such as illness severity and contingency plans and ensure time for clarification and synthesis

between sender and receiver. When handoffs include all members of the inter-professional, clinical teams are more effective in developing shared mental models regarding their patients, and improvement in patient safety follows.

Editors' Comments

It is well accepted in the healthcare safety and quality realms that communication breakdowns are a key contributor to adverse outcomes and harm. A component of robust communication is handoffs. Care transitions are a vulnerable period for patients as they move within systems and through different types of care delivery models. During these transitions in care, the reliance on accurate, timely, relevant handoffs cannot be overstated.

In this chapter, the authors approach the topic by demonstrating the burning platform: communication is crucial, and handoffs can save lives. They present a nice history of handoffs in medicine from the perspective of graduate medical education; this historical perspective has relevance as the lessons and strategies can be extrapolated to other care settings as well.

The authors move the concept of handoffs further by demonstrating key components of handoffs and what is considered to be crucial information. The mnemonics as well as the evidence-based materials help frame the value-add of handoffs within the context of care delivery. Once the improvement scientist knows the parts of the handoff which are important, then they can decide on the best tool to implement for handoffs.

There are handoffs that can be as simple as a department specific tool that is maintained by house staff to proprietary tools described by the authors that can be implemented and scaled within an organization.

The end of the chapter considers the next iteration of handoffs and weaves in the importance of inter-professional teams.

The editor's organizations have embraced the concept of inter-disciplinary teams, and the initial results demonstrate transformational capacity. The role of handoffs will be ever more important when interprofessional teams become the norm. This chapter presents a stepwise approach to understanding the intrinsic value of handoffs all the way to describing techniques to implement handoff programs within your healthcare system.

Chapter Review Questions

1. What are handoffs and what is the intended goal?

Answer: Handoffs involve the process of transfer and acceptance of patient care information and responsibility from one provider (sender) to another (receiver) with the goal of creating a shared mental model.

2. 2: True or false – communication failures can be decreased by standardization of handoffs.

Answer: True. Both written and verbal handoffs can improve communication if information is presented in a consistent and predictable format.

3. What type of information should be included in handoffs?

Answer: Critical information, such as illness severity, code status, vital signs, allergies, medications, events leading up to illness or hospitalization, ongoing assessment, pertinent diagnostic test results, plan of care with action items, and contingency plans, should be included in handoffs [1].

4. List the four "Rights of Effective Handoffs".

Answer: (1) The right location (quiet, consistent time/place). (2) The right people (members of inter-professional team and faculty educators that can assess handoff). (3) The right information (organized in standard format, up-to-date using EHR tools for transcription). (4) The right style of communication (face to face, includes both verbal and

- written handoffs, allows for questions/clarifications, and creates a shared mental model).
- 5. Define the I-PASS mnemonic elements. What advantages have been demonstrated from the I-PASS Handoff program?

Answer: I-PASS stands for illness severity, patient summary, action list, situation awareness and contingency planning, and synthesis by receiver. The program is a standardized bundle that provides strategies to enhance team communication. Implementation of the program at nine children's hospital was shown to decrease preventable errors by 30% and medical errors by 23%.

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