Standardizing the Handoff Process: Better Handoffs, Safer Care

Glenn Rosenbluth, MD
Associate Clinical Professor of Pediatrics
Director, Quality and Safety Programs, Office of GME
Associate Director, Pediatrics Residency Program
Disclosures

• I have no financial relationships related to the material that will be presented.
How can we start to improve patient safety?

It starts with good communication!
Outline

• General principles of good communication
• Communication in handoffs
  – Gaps
  – Strategies
• Research on a handoff bundle
• I-PASS handoff bundle
• Handoffs at UCSF
Communicating Effectively
Communication Channels

www.agilemodeling.com/essays/communication.htm, cited in Arora V.
## Learning Styles

<table>
<thead>
<tr>
<th></th>
<th>Active</th>
<th>Reflective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing</td>
<td></td>
<td>Intuitive</td>
</tr>
<tr>
<td>Visual</td>
<td></td>
<td>Verbal</td>
</tr>
<tr>
<td>Sequential</td>
<td></td>
<td>Global</td>
</tr>
</tbody>
</table>

© I-PASS Study Group, Children’s Hospital Boston
Building a Shared Mental Model

Situation Monitoring (Individual Skill)

Situation Awareness (Individual Outcome)

Shared Mental Model (Team Outcome)
Shared Mental Model
Check-Back

Sender initiates message

Sender verifies message was received

Receiver accepts message, provides feedback confirmation

© I-PASS Study Group, Children’s Hospital Boston
Handoffs

- Frequent
- High-stakes
- Error-prone
- Gaps in care
Quality and Safety Education
2011 ACGME Common Program Requirements

• Sponsoring institutions and programs must ensure and monitor effective, structured hand-over processes to facilitate both continuity of care and patient safety
When Patient Handoffs Go Terribly Wrong

By PAULINE W. CHEN, M.D.
Published: September 3, 2009

I have always felt uneasy about patient handoffs, transferring my responsibility as a doctor to another physician. We cannot be on duty all the time, but I worry that I am playing some real-life medical version of the children’s game “Telephone” where the complexity of my patient’s care will be watered down, misinterpreted and possibly mangled with each re-telling. I wonder, too, if it is only a matter of time before the kind of mistake that happened to Joey (not his real name) might happen to one of my patients.

Two-year-old Joey had been healthy since birth. But a few weeks before I met him, his mother noticed that the left side of his face had started to swell. By the time he appeared in clinic, it looked as if a ping pong ball had been permanently lodged in his cheek.

Despite the senior surgeon’s years of experience, removing the mass from Joey’s cheek proved to be a challenge. It had insinuated itself into every possible crevice; and the nerve that innervated the muscles of his mouth and cheek — the nerve of facial expression — was embedded deep within.
Checking the Right Boxes, but Failing the Patient

By DENA RIFKIN, M.D.
Published: November 16, 2009

The voice on the phone was authoritative, even brusque. A father was calling our after-hours line to ask about his teenage daughter.

“She’s got another "headache," he said, as I recall. “I’m going to the pharmacy, just wanted your advice on what strength of Tylenol to get her.”

Those opening lines did not admit much room for questions. I knew neither him nor his daughter, but there seemed to be little margin for error in my response. I could almost hear his foot tapping, waiting for the answer.

I hesitated. Who is this young woman? Why is her father calling about a simple headache?

I began to ask questions. Yes, his daughter had headaches every now and then. No, this one seemed a bit worse, that’s all. He wouldn’t even have called, but he wasn’t sure if
IN PRACTICE

Doctors could learn something about medical handoffs from the Navy

Mistakes commonly occur when a doctor goes off duty and transfers responsibility of a patient to another doctor. Handoffs are being studied and revamped to ensure continuity and consistency of communication and care.
Quality handoffs?
Why do we care about handoffs?

• Handoffs are linked to medical errors
  – Interviews with postcall interns estimate at least 7.5 per 100-patient-days (average 1/night)
  – 59% of residents reported that one or more patients were harmed during their most recent rotation due to handoff problems
• 12% reported that harm was major

Kitch, 2008; Horwitz 2008
Handoffs: Frequent and High-Stakes

• If one team has 15 patients
• And that team gets handed off every morning
• And every evening
• For 28 days

\[15 \times 2 \times 28 = 840\] per team per month
Problems in Care Continuity

• Work hour limits and presumed resulting discontinuities associated with increased hospital complications and test ordering

• Cross coverage associated with an increased risk of errors (OR 5.2)

Laine, 1993; Peterson, 1998
When do handoffs occur?

- Before and after nights on-call
- Changing blocks
- Receiving patients from referring MD’s
  - New patient
  - Changes in clinical status
- Receiving patients from the ED
  - Workups in progress
- End of academic year
Errors Due To Discontinuity

• Resident discontinuity
  – Delayed test ordering
  – Increased in-hospital complications
  – Increased medication errors
  – Presumed increase in length of stay

Laine C, JAMA, 1993; Gottlieb DJ, Arch Intern Med. 1991
Discontinuity and Patient Harm

• Evaluate factors associated with hospital-based medical preventable adverse events

• Most significant risk for an adverse event: cross-covering MD

<table>
<thead>
<tr>
<th>Adverse Factor</th>
<th>Odds Ratio (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-covering physician</td>
<td>6.1 (1.4 to 26.7)</td>
<td>0.02</td>
</tr>
<tr>
<td>APACHE II score</td>
<td>1.2 (1.1 to 1.4)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>History of gastrointestinal bleeding</td>
<td>4.7 (1.2 to 19.0)</td>
<td>0.03</td>
</tr>
<tr>
<td>Nonsignificant variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicare insurance</td>
<td>1.3 (0.3 to 5.3)</td>
<td>&gt;0.2</td>
</tr>
<tr>
<td>Health maintenance organization or private insurance</td>
<td>1.4 (0.3 to 6.4)</td>
<td>&gt;0.2</td>
</tr>
<tr>
<td>Do-not-resuscitate code status</td>
<td>0.4 (0.1 to 2.2)</td>
<td>&gt;0.2</td>
</tr>
<tr>
<td>Nursing home resident</td>
<td>1.7 (0.3 to 9.1)</td>
<td>&gt;0.2</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1.1 (0.4 to 3.0)</td>
<td>&gt;0.2</td>
</tr>
<tr>
<td>End-stage renal disease</td>
<td>1.1 (0.2 to 5.0)</td>
<td>&gt;0.2</td>
</tr>
<tr>
<td>Primary tumor</td>
<td>0.8 (0.2 to 3.1)</td>
<td>&gt;0.2</td>
</tr>
</tbody>
</table>

* APACHE = Acute Physiology and Chronic Health Evaluation.

Petersen, Ann Intern Med 1994
Hospitalist Handoffs

- Hospitalists report various categories of “missed information” during service change
  - Hospital course, future plans, and disagreements over management

In those with incomplete handoff: 57% had adverse or near miss

<table>
<thead>
<tr>
<th>Uncertainty about the patient care plan (n = 10)</th>
<th>Incomplete (n = 7) %</th>
<th>Complete (n = 49) %</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discovery of missed information that should have been discussed (n = 17)</td>
<td>71</td>
<td>24</td>
<td>0.01</td>
</tr>
<tr>
<td>Report of adverse and near miss events (n = 9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 15 minutes spent dealing with issues arising from missed information (n = 16)</td>
<td>57</td>
<td>10</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Hinami, 2009 JHM
What is the right information?

• U of Chicago: Study of handoffs
  – Asked senders to guess what receivers would say was the most important information for each patient

• Most important information was NOT successfully communicated 60% of the time

• Did not agree on the rationales provided for 60% of items
  – At times contradictory

Why does this happen?

- Speakers systematically overestimate how well their messages are understood by listeners.
- People in general believe that their thoughts are transparent to others.
- The more knowledge that people share, the worse they communicate new material because they overestimate the knowledge of the receiver.
What we say to dogs
Okay, Ginger! I've had it!
You stay out of the garbage!
Understand, Ginger? Stay out of the garbage, or else!

What they hear
blah blah GINGER blah blah
blah blah blah GINGER blah
blah blah blah blah blah...
Retention Hierarchy of Information

Contingency planning (69%)
To-Do items (65%)
Knowledge Items (35%)

Read Back:
Reduces Errors in Communication

• Lab Reporting
  – 29 errors detected during requested read-back of 822 lab results
  – All errors detected and corrected.

<table>
<thead>
<tr>
<th>Description of Error</th>
<th>No. (%) of Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorrect name of patient</td>
<td>10 (34)</td>
</tr>
<tr>
<td>Incorrect test result</td>
<td>9 (31)</td>
</tr>
<tr>
<td>Incorrect specimen/test repeated</td>
<td>6 (21)</td>
</tr>
<tr>
<td>Recipient refused to repeat message</td>
<td>4 (14)</td>
</tr>
<tr>
<td>All</td>
<td>29 (100)</td>
</tr>
</tbody>
</table>

Strategies for Effective Handoffs

Direct observations of handoffs at NASA, 2 Canadian nuclear power plants, a railroad dispatch center, and an ambulance dispatch center

STRATEGIES

• Standardize- use same order or template
• Update information
• Limit interruptions
• Face to face verbal update
  – with interactive questioning
• Structure
  – Read-back to ensure accuracy

Patterson, Int J Qual Health Care. 2004
Creating the Proper Environment

- Quiet location and protected time
  - Notify nurses and others in advance
  - Minimize unnecessary interruptions
- Face-to-face is the gold standard
  - Not always possible or practical
  - If face-to-face is not possible, create a mechanism for a check-back
Global Elements of Handoffs

• Importance of leadership
  – Assign roles, ensure quality
• Unambiguous transfer of responsibility
• Protected time and space
• Standardized format
• Include verbal and written components
Global Elements of Handoffs

- Agreed-upon specific order
- Up-to-date, accurate, relevant information
- Contingency plans included
- Aware of learning styles of giver and receiver
Effective Verbal Handoffs

- Face-to-face
- Structured format, beginning with high-level overview
- Appropriate pace
- Closed-loop communication → shared mental model

© I-PASS Study Group, Children’s Hospital Boston
The Printed Handoff Document

• Supplements the verbal handoff
  • Allows receiver to follow along
  • Provides more comprehensive information
• Succinct, specific, accurate, up to date
• Senior/supervising resident should edit and ensure quality
  – Incorporate time for review and update into daily workflow
Printed handoff documents

- Not immune from error
  - Fatigue also affects written handoffs
    - Due to carelessness in updates, proof-reading
    - Often not actually reflective of current status

Petersen 1998
Data should include:

- Patient summary (exam findings, laboratory data, any clinical changes);
- Assessment of illness severity;
- Active issues (including pending studies);
- Contingency plans (“If/then” statements);
- Synthesis of information (e.g. “read-back” by receiver to verify);
- Family contacts;
- Any changes in responsible attending physician; and
- An opportunity to ask questions and review historical information.

UCSF GME policy 2011
Outline

• General principles of good communication
• Communication in handoffs
  – Gaps
  – Strategies
• Research on a handoff bundle
• I-PASS handoff bundle
• Handoffs at UCSF
Pilot Study of a Handoff Bundle

Communication and Handoff Skills Training + Standardization of Verbal Handoffs + Computerized Handoff Tool = Resident Handoff Bundle (RHB)

© 2011 I-PASS Study Group/Children’s Hospital Boston
All Rights Reserved. For Permissions contact ipass.study@childrens.harvard.edu
Pilot Study Aims

Test the hypotheses that the following outcomes will improve with the implementation of a Resident Handoff Bundle:

• Rates of serious medical errors (primary outcome)
• Written and verbal communications
• Resident workflow (time-motion study)
Study Design

• Prospective pre-post intervention study

• Two general inpatient units at Boston Children’s

• Primary analyses
  – Compare pre- vs. post intervention
    • Rates of medical errors
    • Key data elements on written handoff document
    • Resident workflow patterns

• Secondary analyses
  – Compare changes between the two study units
Methods

• Determined medical error rates using a comprehensive active surveillance methodology
  – Study nurse reviews
    Medication orders
    MAR
    Progress notes
    Nursing notes
    Discharge summary
  – Hospital incident reports
  – Solicitation of verbal reports from nurses
  – Daily solicited error reports from physicians
Results: Medical Error Rates

% of Admissions with Medical Error

Total admissions reviewed: 1255

<table>
<thead>
<tr>
<th>Unit</th>
<th>Pre-RHB</th>
<th>Post-RHB</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1 (Full RHB)</td>
<td>32% (n=117)</td>
<td>19% (n=68)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Unit 2 (No Computer Tool)</td>
<td>45% (n=128)</td>
<td>25% (n=62)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
# Intern Time-Motion Activity

## Pre- vs. Post-intervention

(average minutes per 24 hours in specified activity)

<table>
<thead>
<tr>
<th></th>
<th>Pre-RHB</th>
<th>Post-RHB</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer</td>
<td>408</td>
<td>370</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Patient Contact</td>
<td>122</td>
<td>225</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Communication</td>
<td>494</td>
<td>513</td>
<td>0.09</td>
</tr>
</tbody>
</table>
Outline

• General principles of good communication
• Communication in handoffs
  – Gaps
  – Strategies
• Research on a handoff bundle
• I-PASS handoff bundle
• Handoffs at UCSF
I  Illness Severity
P  Patient Summary
A  Action List
S  Situation Awareness & Contingency Planning
S  Synthesis by Receiver
I-PASS

Illness Severity

Patient Summary

Action List

Situation Awareness & Contingency Planning

Synthesis by Receiver
Illness Severity – A Continuum

- Watcher: *any* clinician’s “gut feeling” that a patient is at risk of deterioration or “close to the edge”
I - Illness Severity
P - Patient Summary
A - Action List
S - Situation Awareness & Contingency Planning
S - Synthesis by Receiver
Sections of a Patient Summary

- Summary statement
- Events leading up to admission
- Hospital course
- Ongoing assessment
  - Organized by problems/diagnoses
- Plan
  - Organized by problems/diagnoses
High Quality Patient Summaries

• Create a shared mental model
• Facilitate the transfer of information and responsibility
• Transmit information concisely
• Describe unique features of the patient’s presentation
• Use semantic qualifiers
### Action List

<table>
<thead>
<tr>
<th>To Do:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Check respiratory exam now</td>
</tr>
<tr>
<td>☐ Monitor respiratory exam Q2h overnight</td>
</tr>
<tr>
<td>☐ Check pain scores Q4h</td>
</tr>
<tr>
<td>☐ Check ins and outs at midnight</td>
</tr>
<tr>
<td>☐ Follow up 6PM electrolytes</td>
</tr>
<tr>
<td>☐ Follow up blood culture results</td>
</tr>
</tbody>
</table>
Illness Severity
Patient Summary
Action List
Situation Awareness & Contingency Planning
Synthesis by Receiver
Situation Awareness

Team level

- “Know what is going on around you”
  - Status of patients
  - Team members
  - Environment
  - Progress toward team goals

Patient level

- “Know what’s going on with your patient”
  - Status of patient’s disease process
  - Team members’ roles in patient’s care
  - Environmental factors
  - Progress toward goals of hospitalization

© 2011 I-PASS Study Group/Children’s Hospital Boston
All Rights Reserved. For Permissions contact ipass.study@childrens.harvard.edu
Contingency Planning

- Problem solving *before* things go wrong

“*If this happens, then...*”
I  Illness Severity
P  Patient Summary
A  Action List
S  Situation Awareness & Contingency Planning
S  Synthesis by Receiver
Synthesis by Receiver

• Provides an opportunity for receiver to
  – Clarify elements of handoff
  – Ensure there is a clear understanding
  – Have an active role in handoff process

• Varies in length and content
  – More complex, sicker patients require more detail
  – At times may focus more on action items, contingency planning

• It is not a re-stating of entire verbal handoff!
Synthesis by Receiver
Synthesis by Receiver

• Provides an opportunity for receiver to
  – Clarify elements of handoff
  – Ensure there is a clear understanding
  – Have an active role in handoff process

• Varies in length and content
  – More complex, sicker patients require more detail
  – At times may focus more on action items, contingency planning

• It is **not** a re-stating of entire verbal handoff!
Better Handoffs. Safer Care.
Outline

• General principles of good communication
• Communication in handoffs
  – Gaps
  – Strategies
• Research on a handoff bundle
• I-PASS handoff bundle
• Handoffs at UCSF
<table>
<thead>
<tr>
<th>Office</th>
<th>Triage</th>
<th>Primary Diagnosis</th>
<th>Code</th>
<th>Secondary Diagnosis</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>541-L1</td>
<td>852.6</td>
<td>Sarcoid (Principal Prob)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>641-L2</td>
<td>36.8</td>
<td>Subdural Empyema 2/2 Sinusitis (Principal Prob)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>647-L1</td>
<td>7.005</td>
<td>Perineal Abscess (Principal Prob)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>657-L1</td>
<td>67.7</td>
<td>Grave's Disease (Principal Prob)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>657-L2</td>
<td>48.2</td>
<td>Dka (Diabetic Ketoacidoses) (Principal Prob)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6NOR-3</td>
<td>8.6</td>
<td>Enlarged Tonsils (More)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These fields will print with the corresponding signoff report in Patient Lists. Click the 'Patient Report' button.

**Primary Team Signout notes**

**Illness Severity:** Watcher: GTC  
**Allergy:** reglan

**Patient Summary:** ID: ___________ is a 15 y.o. female with a generalized epilepsy as well as pseudoseizures, admitted for video EEG also w/ h/o migraines.

#Seizures: GTCs + pseudoseizure  
-pseudoseizure looks like hands and head shaking but maintaining consciousness  
-VEEG  
-Continue home topamax, lamictal, depakote  
-Clonazepam discontinued  
-Sleep deprivation tonight (until 2am) + stimulation w lights and noise

#Migraines  
- cont topamax  
- naproxen pm

**Situation Awareness/Contingency Planning:**  
- Ativan IV for seizure +5 minutes or cluster (> 3 seizures in 1 hour) note: give for GTCs NOT for pseudoseizures

**Synthesis by Receiver (Readback, Ask questions)***
UCSF Handoff Policy

“Each training program must design clinical assignments to minimize the number of transitions in patient care”

- Day/night teams
- Staggering of intern/resident/attending switch times and/or days to maintain continuity,
- Outpatient clinic “pods” or teams
- Schedule overlaps should include time to allow for face-to-face handoffs
“The institution and each program must ensure and monitor effective, structured hand-over processes that facilitate both continuity of care and patient safety”

• Faculty oversight of the handoff process may occur directly or indirectly
• Programs should use the applicable tools to assist them in this structured process

Approved, GMEC: July 18, 2011
Editorial Revision Approved, GMEC: September 26, 2011
Programs at UCSF:

• 33 programs report face-to-face handoffs
  – 15 programs using I-PASS

• 9 programs use email-based handoffs

• 21 programs use electronic
  – 9 are not APeX

• 4 programs report handoffs are not applicable
Handoffs should include at least:

• Patient summary (exam findings, labs, clinical changes)
• Assessment of illness severity
• Active issues (including pending studies)
• Contingency plans (“If/then” statements)
• Synthesis of information (e.g. “read-back” by receiver to verify)
• Family contacts
• Any changes in responsible attending physician;
• An opportunity to ask questions and review historical information

Approved, GMEC: July 18, 2011
Editorial Revision Approved, GMEC: September 26, 2011
Summary

• Duty hour standards → More handoffs
• Training needed to
  – Standardize approach to handoffs
• Pilot study using a Resident Handoff Bundle demonstrated
  – Decreased medical errors
  – Increased resident time with patients
• Handoff curricula and educational materials available online

© 2011 I-PASS Study Group/Children's Hospital Boston
All Rights Reserved. For Permissions contact ipass.study@childrens.harvard.edu
Resources

• I-PASS: A Handoff Bundle including educational resources, online module, videos, and simulations
  http://www.ipasshandoffstudy.com

• Handoffs and Signout Primer: Agency for Healthcare Research and Quality (AHRQ)
  Literature overview with links to case scenarios and expert discussion

• Specialty-Specific Tool-Kits
  One specific one focused on peri-operative handoffs can be found here:
  http://www.aorn.org/PracticeResources/ToolKits/PatientHandOffToolKit/

• Teaching Video: “Handoffs: A Typical day on the Wards”
  Peer-reviewed video that can be used as a trigger for teaching handoffs
  https://www.mededportal.org/publication/8331
Acknowledgements

• I-PASS Study Group – Amy Starmer
• Arpana Vidyarthi
Questions?