SES028: Implementing and Evaluating a Structured, EMR-Integrated, Resident-to-Resident Handoff Process

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University of Kansas Medical Center

- 3 schools:
  - School of Medicine
  - School of Nursing
  - School of Health Professions
- 43 accredited residency/fellowship programs
- 512 trainees
- Primary teaching institution: The University of Kansas Hospital
The University of Kansas Hospital

- Founded in 1906
- Tertiary and quaternary hospital; the teaching hospital for the State of Kansas
- Licensed for 751 beds, staffed to support 576 beds and 24 FT nursery beds
- Nearly 40 facilities providing in/outpatient care
- Product lines include cardiology, cancer, trauma neurosciences, critical care, organ transplantation, and burn.
- 10 programs listed in U.S. News & World Report’s “Best Hospitals in 2012”
The University of Kansas Hospital

- FY12 Volume:
  - 28,331 Inpatient Discharges
  - 530,918 Outpatient Encounters
  - 47,771 Emergency Department Visits
  - 18,867 Perioperative Procedures
- Currently over 6,000 employees with over 40% of those in nursing roles
- Accreditations include TJC, CAP, Level 1 ACS Trauma, Burn Center, Primary Stroke Center, ACS Commission on Cancer, Blood Bank, Radiology, FACT and Chest Pain Center
Learning Objectives

- Describe strategies for establishing and providing instruction around a structured resident-to-resident handoff process
- Describe challenges associated with implementing an EMR-integrated handoff tool as well as strategies for overcoming some of those challenges
- Describe strategies for evaluating the quality of the resident handoff
So why are we here?

(What are the drivers?)
Handoffs

- National priority for AHRQ Patient Safety Network

- Joint Commission Center for Transforming Healthcare project
  (slides used with their permission)

- ACGME
Why Tackle Hand-off Communications?

It has been estimated that 80 percent of serious medical errors involve miscommunication during the hand-off between medical providers. The majority of avoidable adverse events are due to the lack of effective communication.\(^1\)

Breakdown in communication was the leading root cause of sentinel events reported to The Joint Commission between 1995 and 2006 \(^2\) and one U.S. malpractice insurance agency’s single most common root cause factor leading to claims resulting from patient transfer \(^3\). Of the 25,000 to 30,000 preventable adverse events that led to permanent disability in Australia, 11 percent were due to communication issues, in contrast to 6 percent due to inadequate skill levels of practitioners \(^4\).


\(^2\) The Joint Commission Sentinel Event Data Unit.


ACGME Common Program Requirements (effective July 1, 2011)

- VI. Resident Duty Hours in the Learning and Working Environment
  - VI.B. Transitions of Care
    - VI.B.1. Programs must design clinical assignments to minimize the number of transitions in patient care.
    - VI.B.2. Sponsoring institutions and programs must ensure and monitor effective, structured hand-over processes to facilitate both continuity of care and patient safety.
    - VI.B.3. Programs must ensure that residents are competent in communicating with team members in the hand-over process.
    - VI.B.4. The sponsoring institution must ensure the availability of schedules that inform all members of the health care team of attending physicians and residents currently responsible for each patient’s care.
Clinical Learning Environment Review (CLER) Site Visits will focus on:

- Integration of residents into institution’s **Patient Safety** programs, and demonstration of impact
- Integration of residents into institution’s **Quality Improvement** programs and efforts to reduce disparities in health care delivery, and demonstration of impact
- Establishment, implementation, and oversight of **Supervision** policies
- Oversight of **Transitions in Care**
- Oversight of **Duty Hours** policy, fatigue management and mitigation
- Education and monitoring of **Professionalism**
“HELP”
Creating a Platform for Change

- Convened GMEC Subcommittee
- Purpose: to educate residents in patient safety and quality
- Drivers included the New 2011 ACGME Requirements
- Subcommittee took on several projects:
  - Interdisciplinary case conference
  - TeamSTEPPS
  - Transitions of Care (Handoff)
A Successful Hand-off is Critical

SHARE

Standardize Critical Content
- Provide details of patient’s history and status when speaking with receiver
- Identify and stress key information and critical elements about patient when talking with the receiver
- Synthesize patient information from disparate sources prior to passing it on to the receiver
- Develop and use key phrases to help standardized communications

Hardwire Within Your System
- Develop and use standardized forms, and tools and methods, e.g. checklists, SBAR tool
- Establish a workspace or setting that is conducive for sharing information about a patient, e.g. zone of silence
- Have patient present during hand-off discussion between sender and receiver
- State expectations about how to conduct a successful hand-off
- Focus on the system, not just the people

Allow Opportunity to Ask Questions
- Use critical thinking skills when discussing a patient’s case
- Share and receive information— as an interdisciplinary team— about the patient at the same time, e.g. "pit crew"
- Expect to receive all key information and critical elements about the patient from the sender
- Collect sender’s contact information in the event there are follow-up questions
- Scrutinize and question the data

Reinforce Quality and Measurement
- Demonstrate leadership’s commitment to implement successful hand-offs
- Utilize a sound measurement system to determine the real score in real time
- Hold staff managing patient’s care responsible
- Monitor compliance of standardized form, tools and methods for hand-off between sender and receiver
- Measure the specific, high-impact causes of a poor hand-off and target solutions to those causes
- Use data as the basis for a systematic approach for improvement

Educate and Coach
- Teach staff on what constitutes a successful hand-off
- Standardize training on how-to conduct a hand-off
- Engage staff— real time performance feedback; just-in-time training
- Make successful hand-offs an organizational priority and performance expectation

Developed by the participating hospitals, this is a compilation of solutions that are linked to specific root causes.

Joint Commission Center for Transforming Healthcare
Subcommittee’s Role in Handoff Project

- Guided development of two standard handoff processes (medical and surgical) for programs that did not have one defined – creating buy-in
- Identified pilot programs/services
- Created an opportunity for scholarship
- Worked with program directors, residents, I.T., risk management, and GMEC to define needs
- Facilitated discussions about key issues:
  - Rounding vs. Handoff tool
  - Printing and HIPAA concerns
  - Access to the tool for other care team members
Handoff Project Goals

1. Develop a standard, structured, resident-to-resident hand-off process and provide education to residents regarding that process;

2. Develop a tool integrated within the University of Kansas Hospital electronic medical record system to support the hand-off process; and

3. Develop competency/milestone aligned tools to evaluate the quality of resident-to-resident hand-offs.
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Defining the Process and Providing Education (1 of 2)

- Conducted literature review
- Selected “SIGNOUT” mnemonic to structure verbal handoff
- Produced educational materials:
  - Video demonstrating both a “bad” and a “good” handoff (shown at new resident orientation and posted online)
  - Badge buddies
  - “Handoff Essentials” document
Defining the Process and Providing Education (2 of 2)

- Two house-wide presentations to residents developed and delivered by Resident Council:
  - significance of handoffs
  - examples of harm as a result of bad handoffs
  - approaches used at other hospitals
  - “SIGNOUT” mnemonic
## Verbal Handoff Mnemonic

<table>
<thead>
<tr>
<th>MNEMONIC</th>
<th>SAMPLE SIGNOUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Sick or DNR? (state code status, highlight sick or unstable patients, identify DNR/DNI patients) OK, this is our sickest patient, and he’s full code.</td>
</tr>
<tr>
<td>I</td>
<td>Identifying data: name, age, gender, diagnosis Mr. Jones is a 77-year-old gentleman with a right middle lobe pneumonia.</td>
</tr>
<tr>
<td>G</td>
<td>General hospital course He came in a week ago hypoxic and hypotensive but improved rapidly with IV levofloxacin.</td>
</tr>
<tr>
<td>N</td>
<td>New events of day Today he developed a temp of 39.5°C and his white count went from 8 to 14. We got a portable chest x-ray, which was improved from admission, took out his Foley and sent blood and urine cultures. U/A was negative but his IV site looked a little red so we started vancomycin.</td>
</tr>
<tr>
<td>O</td>
<td>Overall current status (Active Hospital Problems) Right now he is satting 98% on 2 l nasal cannula and is afebrile.</td>
</tr>
<tr>
<td>U</td>
<td>Upcoming events plan &amp; rationale (What are we doing about it?) If he becomes persistently febrile or starts to drops his pressures start normal saline at 125 cc/h and have a low threshold for calling the ICU to take a look at him because of concern for sepsis.</td>
</tr>
<tr>
<td>T</td>
<td>To do list plan &amp; rationale I’d like you to look in on him around midnight and make sure his vitals and exam are unchanged. I don’t expect any blood culture results back tonight so there is no need to follow those up.</td>
</tr>
<tr>
<td>?</td>
<td>Any questions? Any questions?</td>
</tr>
</tbody>
</table>

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3. Develop competency/milestone aligned tools to evaluate the quality of resident-to-resident hand-offs.
Pre-intervention Summary

“YESTERDAY”
Pre-pilot state

- Administered a survey to assess how handoffs were being done currently
- SharePoint word documents with entire clinical picture re-typed with no connection to EMR (had existed for years)
  - Fraught with inaccuracies in meds, code status, plans
  - Inefficient (took a lot of time to update daily, one list per team so one would have to wait)
  - Little to no supervision by attendings
  - Not viewable by other disciplines or services
  - Not a part of the “Legal Medical Record”
<table>
<thead>
<tr>
<th>Code</th>
<th>Full Code</th>
<th>All:</th>
<th>Status</th>
<th>Diagnosis</th>
<th>Admission Date</th>
<th>Past Medical History</th>
<th>Current Medications</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1749</td>
<td>yo F</td>
<td>NKDA</td>
<td>Admit</td>
<td>Sepsis likely from G.I. source</td>
<td>7/19</td>
<td>RA, SLE, COPD, Hypothyroid, GERD, extensive abdominal sx 2/2 diverticulitis</td>
<td>Tylenol, xanax, restasis, lovenox, naxium, fentanyl patch, advair, neuontin, hydrocortisone, levaquin, synthroid, max-ox, flagyl, spiriva, Zoloft</td>
<td>Pain - blood cx Fevers - blood cx Pain - PRN vicodin Lactates chronically high: no longer following</td>
</tr>
<tr>
<td>2000</td>
<td>yo M</td>
<td>PCN</td>
<td>Admit</td>
<td>Recurrent abdominal abscess s/p perforated diverticula 5/2011</td>
<td>7/15</td>
<td>DMII, Afib CAD, HTN, HLD, CHF-EF 20%, Nasal carcinoma, colectomy</td>
<td>Tylenol, albuterol, diltiazem, zofran</td>
<td>Ab pain - fentanyl IV prn Pulled drain; no further fluid</td>
</tr>
<tr>
<td>3000</td>
<td>HM</td>
<td>PCN</td>
<td>Admit</td>
<td>Lower GI bleed, fistula</td>
<td>7/8</td>
<td>Polycythemia vera, blind rt eye, htn, RA, CABB, PCI '05</td>
<td>Dapto, Lovenox BID, Courmadin, Prednisone, IVF, stable, 5.5 insulin</td>
<td>Vit c, asa, calc carb, coreg, lovenox, ertapenem, lactobac, prevacid, niacin, prednisone, losartan, lasix, Flomax, Zoloft, lantus, Courmadin, TF (started 7.17)</td>
</tr>
<tr>
<td>3049</td>
<td>M</td>
<td>PCN</td>
<td>Admit</td>
<td>AMS and urosepsis</td>
<td>7/12</td>
<td>HTN, CAD, TIA, COPD, UC, DMII</td>
<td>Nexium, SSI, Bromfenac, nebs Fentanyl PCA TPN</td>
<td>Strict NPO - no meds Fever - bc x 2 Ab pain - fentanyl PCA; try bolus 2ml (20mcg)</td>
</tr>
<tr>
<td>3059</td>
<td>M</td>
<td>PCN</td>
<td>Admit</td>
<td>L hip replacement transferred from MICU after hypercapnic RF and hypotension found to have PE</td>
<td>7/12</td>
<td>HCTZ, Zeotril, triamterene, aspirin, celebrex</td>
<td>Albuterol, norvasc, metoprolol, aspirin, calcium, klonipin, benyl, colace, lovenox, fiorine, idvqir, folic acid, mucinex, novolog, atrovent, prevacid, lidocalm, mag-ox, medizine, lincicne, NTG, zoefan, oxycodone, phenergan, senna, Zoloft, zocor</td>
<td>Ab pain - fentanyl 12.5 mg one time doses; avoid if possible - made sleepy this morning</td>
</tr>
<tr>
<td>3069</td>
<td>M</td>
<td>PCN</td>
<td>Admit</td>
<td>PE</td>
<td>7/12</td>
<td>CABG, ICM, DM, HTN, HLD, RTHA, ICD</td>
<td>Levaquin, flagyl/ ox pending</td>
<td>Sch. : Celexa, Colace, Heparin gtt, prevacid, coumadin</td>
</tr>
<tr>
<td>3079</td>
<td>M</td>
<td>PCN</td>
<td>Admit</td>
<td>L THA</td>
<td>7/12</td>
<td>CABG, ICM, DM, HTN, HLD, RTHA, ICD</td>
<td>Heparin Gtt, coumadin</td>
<td>Pain/swelling of L thigh - on heparin, call ortho if hip enlarging or increase of bleed</td>
</tr>
</tbody>
</table>

**KU Medical Center**

**The University of Kansas Hospital**
Pre-pilot state

- No standard approach/organization- Surgery using much differently than Medical services
- Had a large privacy breech in which an attending had lost laptop with patient information just prior
- Had some resident lists found on the campus by staff, raising concerns about HIPAA/privacy control- lots of PHI listed on handouts
So why integrate with EMR?

- Improve the accuracy, efficiency, and quality of the handoff process
  - “Hardwire” in EMR allowing for better accuracy/efficiency of meds, data, labs be brought in
- Improve PHI protection (HIPAA)
- Improve organization of teams through “mylists”
- Improve physician collegial awareness (novel)
- Allow for attending supervision in handoffs as mandated by ACGME (novel)
GME’s Dream

“IMAGINE”
GME Initial Plan

- Implement EMR’s out-of-the-box Signout Activity
- Create a nighttime handoff report (replication of word document) with desired smart-linked data for Medicine, printable only onsite
- Use iPads to review report in EMR and have the residents not print off anything (to try to mitigate the HIPAA concerns)
- Attendings would be able to have oversight
Pilot 1

- Who: Internal Medicine services, Pediatrics, Rehab, and General Surgery.
- What: EMR Signout functionality, including Patient List Reports configured to 4 columns plus iPad usage
- Result: Mixed.
  - Main obstacle has been the functionality only allows one entry and one view per patient.
  - Not feasible, as many providers need to have handoffs for one patient with their specific information.
Step 1: Open your patient list and with patient highlighted, click the “Sign Out Rpt” button.
Step 2: The Signout entry field opens—note, one patient, one signout
RESIDENT REALITIES =

#1. NOT Viable FOR MULTIPLE UNIQUE SERVICES = EACH SERVICE NEEDS ITS OWN SIGNOUT

“REVOLUTION”
RESIDENT REALITIES =
#2. WANT A TOOL FOR BOTH
ROUNDING AND HANDOFFS

“A DAY IN THE LIFE”
New issue discovered

- Residents from medical and surgical areas use their “handouts” for multiple purposes (very different depending on how services are set up)
- Was the tool to be a hand-off report between providers of the same service for rounding purposes or to be used as a sign-off note for evenings and weekend coverage only?
  - Residents wanted both daytime and nighttime use
Realities

- With the work hour rules, more handoffs are occurring
- Complexity of patients seems to be increasing
- On any given day, residents may be off, in clinic, in the OR
  - Urology would routinely send out a page to all staff and residents re: updates on patients as their way to keep up (very annoying and inefficient)
RESIDENT REALITIES = #3. HAVE TO BE ABLE TO PRINT AND IDEALLY HAVE MORE PATIENTS PER PAGE

“HARD DAY’S NIGHT”
Realities: Printing

- A single night float intern may cover up to 48 patients from 7pm to 7am.
- Calls from nursing are frequent, and the interns ideally desire enough information on their printed handoff to not have to log into the system for every question.
- There are planned follow-up items (labs, imaging, consults) and then unplanned events.
- They have to report significant overnight events in the morning to the team.
Realities: Printing

- With only 1 direct column entry, only 2-4 patients fit per page (minimum of 4 printed pages for a Medicine service of 16 patients) - cumbersome, and not tree-friendly
- Current iPad functionality insufficient to serve as an alternative to printouts
Decision on PAPER/printing

“LET IT BE”
(for now, but with some changes)
Pilot 2

- **Who:** Family Medicine, Neurology, Orthopedics, Urology
- **What:** Sticky Note functionality, with 2 specific notes per service. Included service specific Patient List Reports configured to 4 columns for FM and Neurology.
- **Result:** Positive, with the flexibility to use the sections for their specific needs
Sticky Note Entry View

Family Med MD Rounding

Adm 9/10 for Colitis, Jejunitis Fecal Impaction, and accelerated htn
PMH: Autism, Anemia (iron deficiency, HTN)

PCP: XXX

Consults: Surgery, GI, Gyn

Resident: XXX

PRN: insulin aspart PRN, docusate PRN, phenol/phenolactate PRN, lidocaine PRN, lorazepam injection (ATIVAN) syringe 04H PRN, acetaminophen 04H PRN, ondansetron (ZOFRAN) IV Q6H PRN

Patient List Report View

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<table>
<thead>
<tr>
<th>Patient Name/Age/Sex</th>
<th>Room/Bed</th>
<th>Family Med Rounding</th>
<th>Family Med Handoff</th>
<th>Code Sr Text</th>
<th>Diet Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acistesting, P (57 y.o. F)</td>
<td>TEST89</td>
<td>57 yo male with COPD, DM admitted for HCAP secondary to MRSA</td>
<td>To do: follow-up cultures, ID consult, CXR</td>
<td>FULL</td>
<td>Cardiac Diet DIET ISLAND</td>
</tr>
<tr>
<td>PCP: Dr. Jones</td>
<td>All. PCN</td>
<td>Watch out for: 1. Hypotension- give fluid bolus 2. Fever- pnculture</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Acistesting, Printa #1011349 (Acct: 12203683) (57 y.o. F) (Adm: 03/20/11) Inpatient**

**Scheduled Meds:**
- dapsone, 100 mg, QD
doxycycline 200 mg, QD
- sulfamethoxazole/trimethoprim, 2x400/80 mg, BID
- clarithromycin, 500 mg, QD
- moxifloxacin, 400 mg, QD
- potassium chloride, 50 mg, QD
- loratadine, 10 mg, QD
- vitamin C, 1 g, QD

**Continuous Meds:**
- vancomycin (VANCOCIN) IVPS, 1 g, Q8H
- ampicillin/sulbactam (ABPC) IVPS, 2 g, Q8H
- ceftriaxone (ROCEFIN) IVPS, 1 g, Q24H
- enoxaparin (LUMINARA) subcutaneous 20 mg, Q12H
- becaplermin (REPLAND) IV drip (slud slow), 24, 0.1 mg/kg/hr (06/21/11) 1230
- albuterol (SULMULAR) nebulizer, 2 puffs Q4H
- inhaled corticosteroid (FLUTICAN) nebulizer, 400 mcg QID

**Allergy:** Cefaclor, Oxacillin, Pen, Sulfa(Sulfonamide Antibiotics)

**DOB:** 03/20/1955

**Admission Wt:** 85.0 kg

**Code Status:** Full Code

**Attending:** Gregory Ator, MD

**PCP:** DEFAULT REF DOC

**Contact:** ACISTTESTING, PRINTA

**Rounding Notes:**
- 57yo male with COPD, DM admitted for HCAP secondary to MRSA

**Handoff Notes:**
- To do: follow-up cultures, ID consult, CXR
- Watch out for: 1. Hypotension- give fluid bolus 2. Fever- pnculture

**All. PCN**
Pilot 2 Summary

- Helped with the 3 realities
  - Service specific
  - 2 direct entry sticky notes to allow for more efficiency and clarity
  - Still printable
Survey Results from Pilot 2

- 15/20 said new tools saves time
- 9/16 said more paper printed
- 18/20 prefer the new handoff tool to prior
- 19/20 said easily accessible

Improvements requested (and provided):
- Smartlinked vitals, condensed labs, prn meds, i/os
CURRENT INTERVENTION = HANDOFF NAVIGATOR

“COME TOGETHER”
Implementation of Handoff Navigator & Tools

- Began **October 18, 2012**
- 1-2 sticky notes per service
  - 1 rounding for identification
  - 1 handoff for to do items/anticipatory guidance (watch out for)
- One 4-column data dense report per service (includes smartlinked last 24 hour labs, vitals, i/os, PCP)
- Attendings/NP/PA/Med students have access to Handoff Navigator
- Printable documents are HIPAA friendly
Implementation of Handoff Navigator & Tools

- Surgical Services prefer the “MyList” approach
  - This has been an opportunity to standardize the MyLists by each area, and allow for easy implementation of service specific PAF columns, so they can view on the patient list their rounding/handoff notes.
  - Met with the non-pilot groups to have them add their PAF columns to their shared lists
- Attendings also added to the shared lists so they can quickly review what their residents are doing for signouts.
- Plan to not “purge” the sticky notes. Will not be a part of ROI, but teaching professionalism.
Handoff Navigator, with ability to view all physician handoffs

<table>
<thead>
<tr>
<th>Handoff</th>
<th>(Add/Edit comment)</th>
<th>Handoff</th>
<th>(Add/Edit comment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiology ROUNDDING</td>
<td></td>
<td>Burn-Plastic Surgery ROUNDDING</td>
<td></td>
</tr>
<tr>
<td>Cardiology Handoff</td>
<td></td>
<td>Burn-Plastic Surgery Handoff</td>
<td></td>
</tr>
<tr>
<td>Family Medicine ROUNDDING</td>
<td></td>
<td>Cardiotoracic Surgery ROUNDDING</td>
<td></td>
</tr>
<tr>
<td>Family Medicine Handoff</td>
<td></td>
<td>Cardiotoracic Surgery Handoff</td>
<td></td>
</tr>
<tr>
<td>General Medicine ROUNDDING</td>
<td></td>
<td>Otolaryngology ROUNDDING</td>
<td></td>
</tr>
<tr>
<td>General Medicine Handoff</td>
<td></td>
<td>Otolaryngology Handoff</td>
<td></td>
</tr>
<tr>
<td>Hem/Onc-BMT ROUNDDING</td>
<td></td>
<td>Neurosurgery ROUNDDING</td>
<td></td>
</tr>
<tr>
<td>Hem/Onc-BMT Handoff</td>
<td></td>
<td>Neurosurgery Handoff</td>
<td></td>
</tr>
<tr>
<td>Nephrology ROUNDDING</td>
<td></td>
<td>Obstetrics/Gynecology ROUNDDING</td>
<td></td>
</tr>
<tr>
<td>Nephrology Handoff</td>
<td></td>
<td>Obstetrics/Gynecology Handoff</td>
<td></td>
</tr>
<tr>
<td>Neurology ROUNDDING</td>
<td></td>
<td>Orthopedic Surgery ROUNDDING</td>
<td></td>
</tr>
<tr>
<td>Neurology Handoff</td>
<td></td>
<td>Orthopedic Surgery Handoff</td>
<td></td>
</tr>
<tr>
<td>Pediatrics ROUNDDING</td>
<td></td>
<td>Surgery-General ROUNDDING</td>
<td></td>
</tr>
<tr>
<td>Pediatrics Handoff</td>
<td></td>
<td>Surgery-General Handoff</td>
<td></td>
</tr>
<tr>
<td>Psychiatry ROUNDDING</td>
<td></td>
<td>Surgery-Gn &amp; Min Inv ROUNDDING</td>
<td></td>
</tr>
</tbody>
</table>

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Quick Entry via Patient List View and Provider Handoff Report

Click “Show Report” to get Patient List view.
Patient List View - enter/edit directly from mylist
Optional Patient List Quick View

- 4 column detailed report

Reminder - you can wrench in your team's specific Rounding report if you wish by clicking the...
Handoff report also available once in the patient’s chart via (1) Handoff Navigator activity or (2) Physician Index report
How to enter=intuitive, smart tool enabled

We recommend creating simple smartphrases for structure
# 4-column, data dense report

- Printable on-site only
- All services will have a specific report available

## Illustrated Example

**Patient List**:
- **Acicosting, Prints**:
  - **Patient Name/Age/Sex**: 67 y.o male with COPD, DM admitted for HCAP secondary to MRSA
  - **Room/Bed**: TEST/99
  - **PCP**: Dr. Jones
  - **All POC**

**Rounding Notes**:
- **Type**: Male with COPD, DM admitted for HCAP secondary to MRSA
- **Code**: FULL
- **Note**: To do: follow-up cultures, ID consult, CXR
- **Watch for**:
  1. Hypotension, gross fluid bolus
  2. Fever, pancreatitis

**Handoff Notes**:
- **Type**: Male with COPD, DM admitted for HCAP secondary to MRSA
- **Code**: FULL
- **Note**: To do: follow-up cultures, ID consult, CXR
- **Watch for**:
  1. Hypotension, gross fluid bolus
  2. Fever, pancreatitis

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Changes based on feedback about the 4-column reports

- For the ICU services, we added Ventilator settings, additional labs (only display if present), including lactate, blood gases, lfts.
- For Surgical services, a shorter report that removed medications, and divided items from column 1 into column 2 for possible inclusion of DVT proph + antibiotics (future optimization if possible).

**Vitals Range (last 24 hrs):**
- **Temp:** 37°C (98.6°F)-38.2°C (100.8°F)
- **Pulse:** [88-101]
- **SpO2 Pulse:** [92]
- **SpO2:** [93%-%96%]
- **BP:** (116/72)
- **ABP:** (122/81)
- **Diet:** Clear Liquid
- **Allergies:** Statins, Hmg-Coa Reductase Inhibitors, Sulfaf(Sulfonamide Antibiotics)
- **PCP:** DEFAULT REF DOC

### Vent Settings:
- **Mode:** IMV (12/07 1200)
- **Set Vt (ml):** 400 milliliters (12/07 1200)
- **Set RR:** 15 breaths/minutes (12/07 1200)
- **O2%:** 40% (12/07 1200)
- **PEEP/CPAP:** 5 cm H2O (12/07 1200)
- **PSupport:** 10 cm H2O (12/07 1200)
- **CVC (last 24 hrs):** WBC/Hgb/Hct/Plts: 5.2/13.6/35/190 (12/07 1314)

### Coags (last 24 hrs):
- **INR:** 2.0 (12/07 1245)

### Lytes (last 24 hrs):
- **Na/K/Ca/CO2/BUN/Cr/Glu/Mg/Phos:** 140 4.0 100 31 11.9 90 2.0 3.0 (12/07 1242-12/07 1249)
- **Addt's Chem (last 24 hrs):** AST/ALT/Lactate: 16 18 1.1 (12/07 1242-12/07 1313)
- **ABG (last 24 hrs):** ArtpH/pO2/HCO3: 7.41/39/88/24 (12/07 1243)
- **MVBG (last 24 hrs):** ArtpH/pO2/HCO3: 7.30/60/40/20 (12/07 1245)

### Rounding Notes:
- Patient stable on vent. Weaning to begin in a.m.
- Consults from GI and ID pending.

### Handoff Notes:
- Watch I/O; patient hypertensive during afternoon.
- Lab results pending.
<table>
<thead>
<tr>
<th><strong>Testi, S. (46 y.o. female)</strong></th>
<th><strong>MRN: 4000327</strong></th>
<th><strong>Adm: 9/10/2012</strong></th>
<th><strong>Attending: Stewart F Babbott, MD</strong></th>
<th><strong>Code St: Full Code</strong></th>
<th><strong>Room: 2656/01</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Admission Wt:</strong> 60.78 kg</td>
<td><strong>Current Wt:</strong> 69 kg</td>
<td><strong>Vitals Range (last 24 hrs):</strong></td>
<td><strong>Rows only display if data present</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temp:</strong> [37 °C (98.6 °F)-38.2 °C (100.8 °F)]</td>
<td><strong>Pulse:</strong> [88-101]</td>
<td><strong>Respirations:</strong> [11 PER MINUTE-14 PER MINUTE]</td>
<td><strong>SpO2 Pulse:</strong> 92</td>
<td><strong>SpO2:</strong> 93 %-96 %</td>
<td><strong>BP:</strong> (116/72)</td>
</tr>
<tr>
<td><strong>ABP:</strong> (122/81)</td>
<td><strong>I/O (last 24 hrs):</strong> 12/06 1901 - 12/07 1900 / In: 850 [P.O., 750]</td>
<td><strong>I/O (current shift):</strong> 12/07 0701 - 12/07 1900 / In: 800</td>
<td><strong>P.O., 750</strong></td>
<td><strong>Urine 550, Drains 125</strong></td>
<td><strong>Out: 675</strong></td>
</tr>
<tr>
<td><strong>Continuous Meds:</strong> bupivacaine PCA PNC (non-std) infusion syringe</td>
<td><strong>CRRT dialysate solution 5000ml</strong></td>
<td><strong>CRRT replacement solution (post-filter) 5000ml</strong></td>
<td><strong>fentanyl 1000 units/20 mL syr (CRRT)</strong></td>
<td><strong>HYDROmorphone PCA</strong></td>
<td><strong>sodium chloride 0.9% (NS)</strong></td>
</tr>
<tr>
<td><strong>PRN Meds:</strong></td>
<td></td>
<td></td>
<td><strong>harmine</strong></td>
<td><strong>On Call from Rx</strong></td>
<td><strong>harmine</strong></td>
</tr>
<tr>
<td><strong>ALLERGIES:</strong></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Sidebar access = ability to review chart while updating handoff.
COMMON QUESTIONS
Does everyone (including non-physicians) have access to our handoffs?

- No, only physician providers (includes med students, NP/PA) have access at this time. Physicians can choose to share the access to designated non-physicians. Future possibility of allowing all non-physicians to view is being discussed (focus on patient care)
Are our handoffs considered a part of the medical record?

- While the handoffs are not a part of the standard release of information, all communications are now technically able to be used in a legal case. Professional use is always recommended.
Is this mandatory?

- The feedback has been very positive with the pilots. While not required to use the new tools, it is expected that it will be required for all GME programs as part of accreditation in the near future.
Key issues for each hospital to discuss

- What to include in reports/mylists?
- Printable or not? If so, on-site only?
- HIPAA compliant?
- Viewable by other disciplines?
- Part of the Legal Medical Record?
- How many direct entry columns?
- How to accommodate different needs? (Surgery vs. Medicine)
- Flowsheets vs. Sticky Notes vs. Smartforms vs. other?
- Ability for many disciplines to have their own section, or 1 signout per patient?
- Handoff tool, Rounding tool or both?
- How to not re-create entire chart (unnecessary redundancy)
Handoff Project Goals

1. Develop a standard, structured, resident-to-resident hand-off process and provide education to residents regarding that process;

2. Develop a tool integrated within the University of Kansas Hospital electronic medical record system to support the hand-off process; and

3. Develop competency/milestone aligned tools to evaluate the quality of resident-to-resident hand-offs.
Evaluating Handoffs – Lit Review (1 of 3)

  - online end-of-rotation peer handoff evaluation to characterize performance over time among medical interns
  - statistically significant improvements over time observed for 4 items: 1) communication skills 2) listening behavior 3) accepting professional responsibility 4) accessing the system
  - ratings significantly lower when interns were postcall in written sign-out quality

- 'HEAR Checklist' (novel tool) used by third party observers to characterise active and passive listening behaviours and interruptions during handoffs amongst hospitalists
- Passive listening behaviours are common (eg, affirmatory statements, nodding, and eye contact)
- Active listening behaviours that promote memory retention are rare (eg, read-back, note-taking, and reading own copy of the written signout)
- Handoffs are often interrupted, most commonly by side conversations
Evaluating Handoffs – Lit Review (3 of 3)

  - tested feasibility and validity of a handoff evaluation tool for nurses
  - standardized tool (Handoff CEX) developed based on the mini-CEX: seven domains scored on a 1-9 scale
  - nurse educators observed shift-to-shift handoff reports among nurses and evaluated both the provider and recipient of the report
  - nurses participating in the report simultaneously evaluated each other as part of their handoff
  - scores ranged from 3-9 in all domains except communication and setting (4-9)
  - experienced (>five years) nurses received significantly higher mean scores than inexperienced (=five years) nurses in all domains except setting and professionalism
  - external observers gave significantly lower scores than peer evaluators in all domains except setting
  - well-received by participants
Evaluating Handoffs at KU (In Progress)

- Current Status
  - Informal
  - Some faculty review/print handoff for daily rounds
  - Make notes and provide immediate feedback to residents

- Future Plans
  - Survey faculty to assess current usage and awareness
  - Develop formalized process
    - Verbal Handoff – peer evals, direct observation?
    - Written Handoff – rounds, semi-annual evals?
Summary

- Established a platform for change: GMEC Subcommittee
  - Facilitated collaboration between program directors, residents, I.T., risk management, and GMEC
- Adopted a mnemonic to provide “structure” to the handoff process
- Provided education via multiple delivery methods
- Conducted small pilots and focus groups to develop the best possible electronic tool given limitations of the EMR and associated infrastructure
- Plan to formalize handoff evaluation during daily rounds and tie to semi-annual evaluation
QUESTIONS?