“Nursing Glue” is the “Magic” to Make Things Work

Daniela Mahoney, RN
danielamahoney@hisorg.com
Improving workflow and patient outcomes through customized EHR consulting.
Objectives

- Status of CPOE deployments
- Factors that influence deployment success or failure
  - Organizational
  - External
- Nursing role in CPOE implementation from planning to deployment and beyond
- Nursing benefits
- Nursing challenges
- Lessons learned
- Nursing functions included in CPOE design (system screens)
What is CPOE?

- Definition in literature …
  - “Computer-based Provider Order Entry -- CPOE is the portion of a clinical information system that enables a patient’s care provider to enter an order for a medication, clinical laboratory or radiology test, or procedure directly into the computer. The system then transmits the order to the appropriate department, or individuals, so it can be carried out. The most advanced implementations of such systems also provide real-time clinical decision support such as dosage and alternative medication suggestions, duplicate therapy warnings, and drug-drug and drug-allergy interaction checking.” (Osheroff, 2005)
What is CPOE?

...in reality?
- Information access
- Interdisciplinary communication
- Interdisciplinary relationships
- Practice effectiveness and efficiency
- Workflow reengineering
- Cultural changes
- Patient focused care
- Differentiating factor between ordinary and extraordinary patient care
Patient care is a holistic process

- To make the best treatment decisions, nurses, physicians and other caregivers must have access to the most updated patient information at the point of care, as well as any other supporting clinical data and pertinent information.
- Clinical decision support combined with system-generated reminders and alerts contribute to the delivery of safer, higher quality patient care.
- Information technology that uses standards to support data interchange formats, medical terminologies and knowledge transfer must be considered to enhance clinician’s workflow.
CPOE continued progress

- “Electronic health record implementation is risky. Up to 30 percent fail.”
  David J. Brailer, national coordinator for health information technology

- Hospitals continue to accelerate their IT adoption

- 68% report fully or partially implemented EHR in 2006

- Computerized physician order-entry (CPOE) is gaining traction. In 10 percent of hospitals, physicians routinely ordered medications electronically at least half of the time in 2006

- For laboratory and other tests, physicians routinely placed orders electronically at least half of the time in 16 percent of hospitals

  (Continued Progress Hospital Use of Information Technology, AHA 2007)
Status of CPOE

Chart 4: Level of Health IT Use* by Hospital Size, 2006

- <50 Beds: 58% High, 4% Moderate, 20% Low, 15% Getting Started
- 50-99 Beds: 42% High, 26% Moderate, 29% Low, 12% Getting Started
- 100-299 Beds: 29% High, 87% Moderate, 20% Low, 4% Getting Started
- 300-499 Beds: 18% High, 47% Moderate, 11% Low, 5% Getting Started
- 500+ Beds: 20% High, 40% Moderate, 20% Low, 8% Getting Started

*Level of health IT use is defined as number of fully implemented functions (e.g., drug interaction alerts, order-entry). High is defined as 12-15 health IT functions, moderate is defined as 8-11 functions, low is defined as 4-7, and getting started is defined as 0-3.

Trends in IT usage in hospitals

Hospitals’ use of health IT varies …

Chart 3: Percent of Hospitals with “Moderate” to “High”* Levels of Health IT Use by Hospital Type

<table>
<thead>
<tr>
<th>Type of Hospital</th>
<th>Urban</th>
<th>Rural</th>
<th>Teaching</th>
<th>Non-teaching</th>
<th>System</th>
<th>Non-system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Hospitals</td>
<td>56%</td>
<td>33%</td>
<td>58%</td>
<td>42%</td>
<td>51%</td>
<td>42%</td>
</tr>
</tbody>
</table>

*Level of health IT use is defined as number of fully implemented functions (e.g., drug interaction alerts, order-entry). Moderate is defined as 8-11 functions, while high is defined as 12-15 functions.
Greatest barriers to CPOE

...while hospitals report cost as the greatest barrier to health IT adoption.

Chart 6: Percent of Hospitals Indicating a Barrier Is a “Significant Barrier” or “Somewhat of a Barrier” to Health IT Adoption, 2006

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Significant Barrier</th>
<th>Somewhat of a Barrier</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Costs</td>
<td>54%</td>
<td>40%</td>
<td>94%</td>
</tr>
<tr>
<td>Ongoing Costs</td>
<td>32%</td>
<td>55%</td>
<td>87%</td>
</tr>
<tr>
<td>Acceptance by Clinical Staff</td>
<td>23%</td>
<td>59%</td>
<td>82%</td>
</tr>
<tr>
<td>Interoperability with the Current System</td>
<td>27%</td>
<td>52%</td>
<td>79%</td>
</tr>
<tr>
<td>Availability of Well-trained IT Staff</td>
<td>16%</td>
<td>51%</td>
<td>67%</td>
</tr>
<tr>
<td>Inability of Technology to Meet Needs</td>
<td>11%</td>
<td>51%</td>
<td>62%</td>
</tr>
</tbody>
</table>

Estimated implementation costs

Table 3. Estimated Costs of CPOE Implementation in a Rural State\textsuperscript{39}

<table>
<thead>
<tr>
<th></th>
<th>Median N of Beds</th>
<th>Low Estimate</th>
<th>High Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Hospital</td>
<td>282</td>
<td>$1.9 M</td>
<td>$4.4 M</td>
</tr>
<tr>
<td>Rural Referral Hospital</td>
<td>212</td>
<td>$1.9 M</td>
<td>$3.2 M</td>
</tr>
<tr>
<td>Rural Hospital</td>
<td>62</td>
<td>$1.3 M</td>
<td>$2.1 M</td>
</tr>
<tr>
<td>Critical Access Hospital</td>
<td>45</td>
<td>$1.3 M</td>
<td>$2.1 M</td>
</tr>
</tbody>
</table>

Ongoing operating costs range between $238,000 and $889,000 annually.

To determine implementation feasibility the authors applied a simulation model to all hospitals in Iowa, admittedly using crude estimates of depreciation, interest rates, and third party payments. They conclude that small patient volumes would not generate reimbursements sufficient to fund increased operating costs resulting from CPOE in small hospitals. However, the authors suggest that for urban hospitals and rural referral hospitals, the substantial cost impact of a CPOE could be offset by patient care cost savings and increased revenues.\textsuperscript{39}
Overcoming cultural perspectives

Physician quotes:

- **Efficiency**
  - “I can now write 27 orders for an asthma patient with three clicks”
  - “I don’t see any efficiencies”

- **Quality**
  - “My gut feeling is if the tool helps us standardize a process it will improve quality”
  - “I bet this is not a relational data base, so how can you manipulate data to show quality?”

- **Safety**
  - “I think CPOE is a big safety benefit and will decrease liability”
  - “Medication errors have no consequence to patients, so a decrease of errors by 50% would not impact quality at all. Ninety-thousand people don’t die a year. It’s cooked data”
  - “In fourteen years I can’t remember a single case of my patients getting a wrong medication”

- **P4P**
  - “I don’t know anything about it, but it sounds great”
  - “With CMS regulations it’s coming and it will all be public information, so let’s get ready”
Financial savings, truth or myth?

Widespread use of electronic health record systems can realize significant savings for a variety of stakeholders.

Chart 12: Estimated Average Annual Savings from Widespread Use of Electronic Medical Record Systems* by Recipient of Savings

Total Savings, $41.8 Billion

- 38% Private Payers
- 28% Medicare
- 10% State and Local Government
- 15% Medicaid (Federal Savings)
- 5% Out-of-Pocket Savings (Consumer)
- 5% Other

*The authors' analysis focuses on electronic medical record systems, defined to include electronic medical record, clinical decision support, a central data repository, and computerized physician order-entry. Please note this differs from the electronic health record definition in the text, defined by AHA as “systems that integrate electronically originated and maintained patient-level clinical health information, derived from multiple sources into one point of access.” Totals do not sum due to rounding.

Can we afford not to do it?

Health IT has the potential to improve patient safety and lower costs...

Chart 1: Potential Adverse Drug Events Avoided and Associated Federal Cost Savings over a 10-year Period from Electronic Prescribing

Avoidable Adverse Drug Events

1.6 Million

Federal Savings*

$29.2 Billion

*Federal savings due to electronic prescribing for all Medicare Part D prescriptions.

EHR Adoption Model

- HIMSS Analytics 2007 - EMR Adoption Model that measures and tracks the deployment of clinical system applications in healthcare.
  - This model demonstrates that most hospitals have not progressed past infrastructure implementations of clinical applications or EMR components at this time.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>% of U.S. Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Medical record fully electronic; CDO able to contribute to EHR as byproduct of EMR</td>
<td>0.0%</td>
</tr>
<tr>
<td>6</td>
<td>Physician documentation (structured templates), full CDSS (variance &amp; compliance), full PACS</td>
<td>0.1%</td>
</tr>
<tr>
<td>5</td>
<td>Closed loop medication administration</td>
<td>0.5%</td>
</tr>
<tr>
<td>4</td>
<td>CPOE, CDSS (clinical protocols)</td>
<td>1.9%</td>
</tr>
<tr>
<td>3</td>
<td>Clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology</td>
<td>8.1%</td>
</tr>
<tr>
<td>2</td>
<td>CDR, CMV, CDSS inference engine, may have Document Imaging</td>
<td>49.7%</td>
</tr>
<tr>
<td>1</td>
<td>Ancillaries – Lab, Rad, Pharmacy</td>
<td>20.5%</td>
</tr>
<tr>
<td>0</td>
<td>All three ancillaries not installed</td>
<td>19.3%</td>
</tr>
</tbody>
</table>

Where would nurses NOT be involved?
The nursing application environment is a critical foundation for implementing an electronic medical record (EMR).

Nursing applications are key components to building an infrastructure that can support provider order entry and closed loop medication administration processes.

- Patients are admitted to hospitals for nursing care – not physician care. Therefore, it is an environment that hospital executives should focus on and evaluate before moving too far forward with any physician applications beyond results reporting.

<table>
<thead>
<tr>
<th>TABLE NA9</th>
<th>Nursing System Temporal Contract Signing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EMR</td>
</tr>
<tr>
<td>Prior to 1989</td>
<td>1.51%</td>
</tr>
<tr>
<td>1990 to 1994</td>
<td>2.38%</td>
</tr>
<tr>
<td>1995 to 1999</td>
<td>9.50%</td>
</tr>
<tr>
<td>2000 to 2005</td>
<td>86.61%</td>
</tr>
</tbody>
</table>
Greatest CPOE barrier in hospitals

National nursing shortage crisis
  - About 70,000 nurses are graduating each year in America, but even at that rate, the country will need about 1 million more nurses by 2020, about the time the average reader of this information turns 65
Nursing concerns with CPOE

- No. 1 concern of the nursing staff was timely notification of new or changed orders
- In a University of Pennsylvania study, the use of CPOE resulted in decreased collaboration between nurses and physicians
- Communication of orders between unit secretaries and nursing
- Loss of visual clues about new or changed orders
How do we spend nursing time?

- Evaluated the time spent by staff caused by "questionable" orders requiring further clarification either with a peer, receiving department or ordering physician at St. Vincent Mercy Medical Center, Toledo, Ohio
  - Time and motion study
  - Total number of questionable orders: 91 (from 02/10/05 to 05/24/05)
- Each questionable order was recorded and derived together with various aspects, which included:
  - Order type
  - Total time spent
  - Start and end time
  - Time spent in carrying out the questionable orders
Time not well spent – ambiguous orders

4) Histogram of Total Time Spent (minutes)

Most questionable records can be fixed with a time range from seconds to 6 minutes. 43 questionable orders can be clarified within 4 minutes. Obviously, the distribution is positively skewed; several orders (outliers) need more time to be carried out by RNs.
Time not well spent – ambiguous orders

We checked the frequency of the orders and obtained the following chart: In 91 orders, there were 14 orders with the "Lab" type representing 15.38% of the total number of orders. There were 48 orders with the "Other" type representing 52.7% of the total number of orders. The percentage for the RAD and RX type are similar, respectively 13.2% and 15.40%.
Time not well spent – ambiguous orders

2) Boxplot of Total time Spent vs. Order Type (91 orders):
   - the median of total time spent in each order

```
Boxplot of Total Time Spent vs Order Type

Order Type
- Lab
- Lab/other
- other
- Rad
- Rad/other
- Rx

Total Time Spent (minutes)
0 5 10 15 20 25

median 3.86
mean 4.59429
outlier: 24.17
outlier: 17

4.81813
4.205
4.27663
6.016
4

```

"Nursing Glue" is the "Magic" to Make Things Work
Lessons learned

- Many orders are incomplete
- Takes time to identify who ordered and locate contact information
- The order may be legible but clinically “does not fit,” ambiguous
- Takes time and clinical experience to interpret the meaning of what was the intention of the order

How could we prevent this with CPOE?

- Get nursing involved early in validating Order Sets content and orderable services especially for “other” types of orders
A different perspective

Then...

Glass thermometers must remain in contact with sublingual tissue for 8 min. Rectal temperature takes 5 min, axillary temperatures up to 11 min.

Simple math:
Average nurse to patient ratio on med/surg unit 1:6
Taking only temperature on 6 patients = 48 minutes
Add the rest, BP, pulse and respirations = 4 min
Total time for VSS = 12 min x 6 patients = 1hr 12 min
A different perspective

...and now

Average time = 6 seconds x 6 patients = 36 seconds!

PROGRESS IS IMMINENT!
Nurses: the “glue” that holds it together

- Because nursing plays such a central role in patient safety, transforming the nurse’s work environment must be a critical part of every healthcare organization’s patient safety and IT strategy efforts.

- A wide range of technology solutions are available today that can enhance the accuracy and efficiency of the many tasks that make up nursing work. When applied within the framework of appropriate process analysis and change, these technologies:
  - Reduce opportunities for error
  - Provide more comprehensive and timely information for clinical decision-making
  - Reduce time spent on administrative activities that can better be spent on direct patient care contributing to a safer care environment.
Nurses: the “glue” that holds it together

- Nurses understand the **cross-disciplinary workflow** processes that will be impacted through CPOE implementations
- Nurses take a holistic, 360’ view of patient care, care process, workflow analysis and **change management**
- There is significant organizational complexity in implementing such systems. In order to successfully deploy CPOE systems, **transformation of care processes must occur**. Nurses and nurse informaticists are key catalysts in this transformation
  - **Understanding communication processes** is one of the keys to understanding the change management process with CPOE implementation
  - The larger **decision-making process** of care delivery in an integrated clinical system is facilitated through changes in nursing practice

NURSING IS THE HUB OF COMMUNICATION!
Communication flow

Physician  Nurse  Patient
What are nurses saying after CPOE implementation?

- “Having a nursing department that is proficient is key to the success of the CPOE initiative. Physicians look to the nursing staff for assistance and they are more inclined to take help from staff they know and trust than staff they are not familiar with (other IS staff). Also, assistance in the planning of the order sets by nursing enhances their buy-in and positive attitude. A positive attitude towards the system is key to success.”
  
  Kathleen O’Connell, RN Director Medical Surgical Department

- “Nursing ties it all together...they do order entry, become proficient (super-users), then in turn assist and educate the physicians. Physicians have a rapport already with the nursing staff, so they would be more comfortable asking for their help. Assistance in developing the order sets/assessments/data collection forms helps with buy-in and use of the system.”

  Sarah Rains RN, Sr. Clinical Analyst
What are nurses saying after CPOE implementation?

- “Nurses have **ALWAYS** been the glue with or without CPOE. We follow up with physicians, ancillaries dept, and families. We are great communicators, but we have to be as we are the pts voice, we ensure labs are drawn, tests are scheduled, coordinate treatments, ensure results are noted, and make sure outstanding issues are addressed...nothing has changed much with the implementation of CPOE, except where and how the information is stored, gathered, and entered. **Nursing adaptation to CPOE can be greatly influenced with early education and training of the system.**”
  
  B. Schomaker, RN, Sr. Clinical Analyst

- “I believe nursing is the "glue" throughout the patient stay in the hospital - not just for CPOE, but for **positive progression of the patient through the hospital experience**. Nurses advocate for the patient, coordinate services, etc. - we now use a different system to communicate and work with data (and continue to serve as **educators to physicians** for this system) - we've changed how we do things and addressed some patient safety and process issues along the way, but in the end we still provide the coordination of all care of the patient.”

  Kathy Miller, MSN, RNC, Manager/CNS Pain Care Clinic
When do we get nursing involved?

…From the moment you start planning!

- Nursing implication in a CPOE project implementation cycle begins with defining:
  - Vision
  - Scope
  - Implementation approach
  - Timeline
  - Roll-out strategy
  - Training strategy
  - Support model
  - Strategy for sustaining the system
  - Measuring outcomes
CPOE team structure - key nursing positions

EHR Team Structure

- Division VP, CIO
- Regional Director of Applications
- CMIO
- Daniela Manclaney, RN
  - Project Director
- Secretary
- RN
  - Project Manager
- AdHoc Reports
- Orders Process

Pharmacy Team
- RN - Global, Rounds, Reports, Rx
  - Session Prints, Rx Pathways, MedRec, HIM Reports
  - RN - Rx Pathways, RE
  - Consultant - Rx pathway, RE, CNI
  - NetAccess, Console Census, Global, MedRec, Specialized Functions
  - Consultant - Rx Pathways
  - Consultant - Otx, Rx, Pathways, Pharmacist - Rx Liaison
  - Consultant - Data Comission Analysis, Otx, Reports, EAD/OCR Reporting, Care Provider Census, CDS Reports

Ancillary Team
- RN - Team Lead
- Consultant RN - Clinical Documentation, Global Orders Process
- Clinical Documentation
- RN - Team Lead
- Consultant RN - Clinical Documentation, Global Orders Process
- LCR/COE/POE SS
- RT - Team Lead, Order Sets
  - RN - Order Sets
  - RN - Order Sets, RT, Nursing Orders
  - Analyst - Results, Interface, RE

Education Team
- RN Coordinator
  - RN
  - RT
  - RN

EHR Support Technicians
- 4 FTE's
- 2 ½ FTE's
## Deployment approach and nursing impact

<table>
<thead>
<tr>
<th>Deployment Strategy</th>
<th>Physician Consideration</th>
<th>Nursing Considerations</th>
<th>IT Considerations</th>
</tr>
</thead>
</table>
| Unit (or unit clusters based on patient transfer flow) | 1. + All orders are in one location  
2. + Know where system is implemented  
3. + Support from nursing staff | 1. + All orders are in one location, legible, eliminates time deciphering  
2. + Consistent processes for patients on the unit  
3. + Access to additional tools, standardizes the communication process | 1. + Controlled, manageable support  
2. + Targeted content development  
3. + More known and predictable impact on processes |
|                     | 1. – Transferred patients have orders in dual systems (CPOE and paper)  
2. – All physicians carrying for patients need to understand processes associated with dual systems (writing orders in CPOE on one unit and paper on other, communication impacts)  
3. – Not all specialties may be represented in CPOE during the early stages of deployment  
4. – Not all processes are defined since might have not yet been discovered | 1. – Dual systems during implementation (patient transfer)  
2. – Decreased efficiency if CPOE physician adoption is not mandated  
3. – Maintaining data in one location results in backloading efforts | 1. – Creates dual processes for clinicians, unanticipated system changes  
2. – Limited lesson learned during deployment (Peds will be different than ICU)  
3. – Able to support user demands if roll-out not realistically planned |

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# Deployment approach and nursing impact

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<th>Nursing Considerations</th>
<th>IT Considerations</th>
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</thead>
</table>
| Specialty (physician) Assumes clerical order entry for orders written on paper | 1. + Can use system regardless of location  
2. + Achieve efficiency faster  
1. – Not all orders viewed in the system are physician entered (potential transcription errors)  
2. – All location will have dual processes until all specialties are live  
3. – Inconsistencies in communicating orders to the staff | 1. + Some of the orders are more legible  
2. – Dual processes  
3. – Increased paper generation (single source of information is the paper chart)  
4. – Potential errors related to loss of printouts  
4. – Not be able to support physicians with CPOE functions | 1. + Targeted content development  
2. + Targeted audience for training  
3. – Difficulty for support as physicians can enter orders on any unit  
2. – Focus of implementation is limited to physicians  
3. – Impact on many processes throughout the hospital with limited staff to support resolution |

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# Deployment approach and nursing impact

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<th>Physician Consideration</th>
<th>Nursing Considerations</th>
<th>IT Considerations</th>
</tr>
</thead>
</table>
| **Patient Flow** (Based on admission) | 1. Rapid use house wide  
2. System available everywhere  
3. All orders in one location  
4. Reduced transition time (based on average LOS) | 1. Short transition from paper to electronic  
2. Progressive transition, improved adaptability to accept the system  
3. Orders in one location: system or paper chart | 1. Short transition from paper to electronic  
2. Faster discovery of process issues and their resolution  
3. Decreased roll-out time |
|                     | 1. Not all content may be available up-front  
2. Not all processes may be well outlined  
3. During transition, understand e-patients vs. paper patients | 1. Transition time creates communication difficulties (remembering what to do with paper vs., electronic orders)  
2. Non-refined processes need rapid resolution and communication house wide  
3. Bridging the gap between paper to electronic (between physicians and ancillaries) result in additional effort | 1. Support may be difficult based on hospital size  
2. Increased up-front implementation time as all specialties need to be represented  
3. Increased number of users to be trained at once  
4. May not be able to do just in time training  
5. Post live support for system enhancements – delays in addressing user needs |
# Deployment approach and nursing impact

<table>
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<th>Deployment Strategy</th>
<th>Physician Consideration</th>
<th>Nursing Considerations</th>
<th>IT Considerations</th>
</tr>
</thead>
</table>
| “Big bang” House wide | 1. + All orders available in CPOE  
2. + Consistent processes  
3. + Increased efficiency |
|                     | 1. + All orders available in CPOE  
2. + Consistent processes  
3. + Increased efficiency |
|                     | 1. – Not all Order Sets may be available at live  
2. – More “a la carte” ordering in early months post deployment |
|                     | 1. – Non-refined processes need rapid resolution and communication house wide |
|                     | 2. + Short transition from paper to electronic  
3. + Faster discovery of process issues and their resolution  
4. + Decreased roll-out time |
|                     | 1. – Support may be difficult based on hospital size  
2. – Increased up-front implementation time as all specialties need to be represented  
3. – Increased number of users to be trained at once  
4. – May not be able to do just in time training  
5. Post live support for system enhancements – delays in addressing user needs |
Process intensive locations

- Areas that present complex clinical and process needs
  - Emergency Department
    - Stand-alone tracking systems + CPOE = NO Integration
      - Nursing handoff communication
  - PAT/OR/PACU
    - JC requirements (hand-off communication of orders)
      - Nursing management of pre and post-op orders
      - Coordination of care related to patient’s location
    - Reimbursement (CMS)
      - i.e., documentation of correct patient status PRIOR to procedure
        » Obtaining documentation to meet requirements, multiple nursing processes
Process intensive locations

- Areas that present complex clinical and process needs
  - Dialysis
    - Serve inpatients & outpatients
      - Nursing order management: orders in dual systems (paper and CPOE), repetitive orders, meds ordered on the unit but needed in dialysis
  - Pediatrics/PICU/NICU
    - Wt based dosing
    - IV fluids volume management
  - Hematology/Oncology/BMT
    - Complex protocols
    - Complex calculations
    - Multiple checks & balance processes across disciplines
      - Nursing documentation of dual order checking, embedding hospital chemo policies into CPOE
  - Medication Reconciliation
    - Ownership, who does what, when and how
Investing in nursing training

September 2006 CDW survey (559 nurses)

- 25% indicated they received no IT training in previous 12 months
- 55% said more IT training would have the greatest impact on improving their use of the systems
- Even with the lack of training, 44% indicated they spend three or more hours/day using IT functions
- 86% strongly believe IT can improve patient care
Post implementation nursing training

Nursing survey purpose: evaluate best forms of communication for ongoing changes post CPOE roll-out.
Nursing training feedback

The Importance for Staff Education

- Webex online Conference
- Online CBT via Thinkwise
- Training Updates w/in HER
- Posted Flyers

in EHR

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Nursing training

Question: Would you like "On the unit" training sessions?

There are 75 nurses in SAMH, 144 nurses in SCMH and 279 Nurses in SVMMC who chose the “Yes”. FOR HOW LONG? Their answers are in the following graph:

For How Long - on site training session

- 5 MINUTES
- 10 MINUTES
- 15 MINUTES
- 30 MINUTES
- 1 HOUR

<table>
<thead>
<tr>
<th></th>
<th>SAMH</th>
<th>SCMH</th>
<th>SVMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10 min</td>
<td>10</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>15 min</td>
<td>49</td>
<td>92</td>
<td>0</td>
</tr>
<tr>
<td>30 min</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>1 hr</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>
There are 62 nurses in SAMH, 105 nurses in SCMH and 195 Nurses in SVMMC who chose the "Yes".

What time is best for you? Their answers are in the following graph:

---

**Time Best for the Nurses: 1 or 2 hours refresher courses**

- **SAMH**: 27 (END OF SHIFT), 20 (MIDDLE OF SHIFT), 14 (START OF SHIFT)
- **SCMH**: 44 (END OF SHIFT), 36 (MIDDLE OF SHIFT), 25 (START OF SHIFT)
- **SVMMC**: 81 (END OF SHIFT), 65 (MIDDLE OF SHIFT), 49 (START OF SHIFT)
Cost of nursing involvement

- Why is this important?
  - Who will budget for educating the nursing staff, IS or Nursing?
  - Budgets are done 12-16 months prior to training – share the plans with all departments EARLY
  - Is your organization measuring productivity?

Example: Hospital staffing costs associated with CPOE training of RN’s

<table>
<thead>
<tr>
<th>Task</th>
<th>Number</th>
<th>Hrs/Wk</th>
<th>$/Hr</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning/Design (12 mo)</td>
<td>4</td>
<td>4</td>
<td>$35</td>
<td>$26,880</td>
</tr>
<tr>
<td>Nurse Champions Training (6 mo)</td>
<td>24</td>
<td>8</td>
<td>$35</td>
<td>$174,720</td>
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<tr>
<td>Training Materials</td>
<td></td>
<td></td>
<td></td>
<td>$25,000</td>
</tr>
<tr>
<td>Nursing Staff Training for CPOE</td>
<td>1200</td>
<td>4</td>
<td>$36</td>
<td>$172,800</td>
</tr>
<tr>
<td>Retraining/Contingency 20% of total</td>
<td></td>
<td></td>
<td></td>
<td>$79,880</td>
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<tr>
<td><strong>Total Capital $ for Nursing Training</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$479,280</strong></td>
</tr>
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</table>
### Support model – set real expectations

#### EHR - Inpatient Unit Support Structure Model - Draft (August 94, 2014)

<table>
<thead>
<tr>
<th>Week of Live</th>
<th>Staffing Coverage</th>
<th>Total (Hrs)</th>
<th>FTEs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNIT USERS</td>
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<tr>
<td>Physicians - ATTN</td>
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<td>Physicians - Res</td>
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<td>Nursing (RN, HUC)</td>
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<td>Lab, Rad, Procedures, Pharmacy</td>
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<tr>
<td>Support EHR Team</td>
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<tr>
<td>RN Super User Pby Gps</td>
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<tr>
<td>TECHNICAL SUPPORT EHR Technical Team (Command Ctr)</td>
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<tr>
<td>Devices (Desktop)</td>
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<td>Network/Infrastructure</td>
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<td>Wireless</td>
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<tr>
<td><strong>Unit X (Unit Support - Days/Week)</strong></td>
<td></td>
<td>112</td>
<td>28</td>
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<tr>
<td>RN(C) (for each shift)</td>
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<td>HUC (for each shift)</td>
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<td>Support RN Super User IS Clinical Support</td>
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<td>TECHNICAL SUPPORT EHR Technical Team (On Call Analyst)</td>
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<td>IS Help Desk</td>
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<td>RN(C) (for each shift)</td>
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<td>HUC</td>
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<tr>
<td><strong>Week 4 Totals</strong></td>
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<td>95</td>
<td>14</td>
</tr>
</tbody>
</table>

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Support model – staff tracking tool

EHR Support Call Tracking System - Entry Form

Tracking ID: 27659
Date Reported: 11/13/2007
Time Reported: 8:30:00 AM
Time elapsed from page to user contact (min.):

Location:

Notification Type:

Call turned over to:
- EHR Member - Name:
- Magic Ticket Opened
- Help Desk - Ticket #:
- Dept Manager - Name:

Description:

Resolution upon 1st Call?
- Yes
- No

If No, number of calls to resolve:

Call Category:
- AdminRx
- Bug Tracker Follow-up
- Physician Refusal
- Feedback
- Security
- Hardware
- Support
- NetAccess
- Education
- Non-EHR Software
- EHR Global Order Entry Functions
- Process
- EHR Consults
- Printing/Reports
- EHR Lab
- EHR Rad
- EHR Pharmacy
- EHR Clincoc
- EHR Dietcty
Support model – user calls distribution

Figure 1: Total Calls Per Hour (from 07/01/07 to 11/31/07, 4,172 records)
Support model – calls per user type

Figure 3: Data categorized by Call Type
07/01/07 - 10/30/07

- Nurse: 2964 (71.05%)
- Physician: 690 (16.54%)
- HUC: 194 (4.65%)
- Other: 120 (2.88%)
- Pharmacist: 73 (1.75%)

Graph of Percentages
Support model – type of user calls

Figure 4: Data categorized by Call Category
from 07/01/07 to 10/31/06 (4,172 records-Top 10)
Top ten considerations for nursing in CPOE implementations

- Get nursing involved in establishing and participating in the governance structure
- Include nursing in physician design meetings and decisions
- Address # 1 nursing concern: notification of new and/or changed orders
- Evaluate nursing computer skills prior to CPOE, train if necessary, allocate $
- Establish nursing champions as part of your support structure, allocate $
Top ten considerations for nursing in CPOE implementations

- Understand clinical workflow for process intense areas; form multidisciplinary clinical teams to provide solutions
- Must involve nursing in Order Sets development as well as service selection options and structure
- Involve nursing in synonym definition
- Provide functions in CPOE to help nursing manage the electronic orders
- Define a clear process for hand-off communication of CPOE orders
Examples
of Nursing Functions in CPOE

Examples (System Screens)
Medication Reconciliation Reminder
Complete Orders
Note Orders
ED and Post-op Orders Management
Nurse Shift Check
Display Orders Flags and Structure (workflow based)

“Success is the good fortune that comes from aspiration, desperation, perspiration and inspiration.” (Evan Esar)
Compliance reminder
**Visual reminder**

Patient: Zzhpftest, Svmmc

<table>
<thead>
<tr>
<th>Order</th>
<th>Description</th>
<th>Start Date</th>
<th>Start Time</th>
<th>Order Physician</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>STS (DC# 148) FUROSEMIDE TABLET 20 MG ORAL UNKNOWN FREQUENCY</td>
<td>04/25</td>
<td>17:44</td>
<td>BERTKA, KENNETH R</td>
</tr>
<tr>
<td>151</td>
<td>STS (DC# 148) OMEPRAZOLE 20 MG ORAL 1 TIME/DAY</td>
<td>04/25</td>
<td>17:44</td>
<td>BERTKA, KENNETH R</td>
</tr>
<tr>
<td>152</td>
<td>STS (DC# 148) RE-EVAL NEED FOR STRESS ULCER PROPHYLAXIS WHEN</td>
<td>04/25</td>
<td>17:44</td>
<td>BERTKA, KENNETH R</td>
</tr>
<tr>
<td>140</td>
<td>DISFUROSEMIDE TABLET 20 MG ORAL UNKNOWN FREQUENCY</td>
<td>04/14</td>
<td>12:00</td>
<td>BERTKA, KENNETH R</td>
</tr>
<tr>
<td>146</td>
<td>DIS OMEPRAZOLE 20 MG ORAL 1 TIME/DAY</td>
<td>04/06</td>
<td>19:00</td>
<td>ABEWI, SUALMAN</td>
</tr>
<tr>
<td>148</td>
<td>DISRE-EVAL NEED FOR STRESS ULCER PROPHYLAXIS WHEN TRANSFERRED</td>
<td>04/02</td>
<td>17:17</td>
<td>ABEWI, SUALMAN</td>
</tr>
<tr>
<td>147</td>
<td>VER LORAZEPAM 0.5 MG ORAL 1 TIME/DAY</td>
<td>04/12</td>
<td>08:00</td>
<td>BERTKA, KENNETH R</td>
</tr>
<tr>
<td>112</td>
<td>CAN AMYLASE TODAY</td>
<td>03/25</td>
<td>09:00</td>
<td>BERTKA, KENNETH R</td>
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<tr>
<td>137</td>
<td>STS (DC# 129) CULT, FUNGUS AWAITING SPECIMEN</td>
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<td>STS (DC# 129) CULT, FUNGUS CST</td>
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<td>22:43</td>
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</tbody>
</table>

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September, 2008

“Nursing Glue” is the “Magic” to Make Things Work
Physician selection verification
Medication reconciliation intelligent selections

![Medication Reconciliation Intelligent Selections](slide54.png)
Visual alerts
Discharge medication reconciliation

Patient: Zzhptst.Svmmc
User: MAHDRN

No orders approaching expiration.

Legend:
- Not Continue on Discharge
- Continue on Discharge

Current Orders in Yellow
- Home Medications in Purple

Orders:
- 2 Hmi Acetaminophen 650 mg oral every 4 hrs prn
- 179 Ver Ampicillin 500 mg / NS 50 ml intravenous every 8 hrs
- 13 Hmi Aspirin 256 mg oral 1 time/day
- 181 Ver Azithromycin 250 mg oral every 4 hrs x 5
- 57 Hmi Lasix 10 mg oral 1 time/day
- 159 Hmi Furosemide Tablet 20 mg oral 1 time/day
- 150 Ver Furosemide Tablet 20 mg oral 1 time/day
- 142 Ver Lorcetfam 0.5 mg oral 1 time/day
- 171 Ver Naloxone 4 mg intravenous as directed prn
- 100 Ver Basal Rate 50 cc/hr patient dose 25 cc fenzykclgltr ecr e
- 155 Hmi Potassium Cl 20 med oral 1 time/day
- 157 Ver Potassium Cl 20 med oral 1 time/day

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September, 2008

“Nursing Glue” is the “Magic” to Make Things Work
Compliance reminders

Clinical Alert/Reminder

The pneumococcal and/or influenza vaccination information is still incomplete in the nursing admission history. Please complete this required information in the Enter Patient Factor section of EHR Clindoc.

Note

This computer generated reminder is provided to supplement the knowledge of health care professionals. It is not intended to replace current medical practices, sound professional judgement, or individualized patient care.
End of shift documentation
Nursing communication

Nurse to Nurse Order

NOTICE

Nurse to Nurse Orders are to be used only for nurse to nurse communication, as they do not require physician signature. These orders can only be discontinued and will generate no printouts. Be aware that all Nurse to Nurse Orders are a part of the patient's medical record.
Patient safety

DEEP VEIN THROMBOSIS PROPHYLAXIS
:: Risk Factor Assessment ::

Check all RISK FACTORS:

- Age 41 to 60 years
- Age 61 to 74 years
- Age over 74 years
- Documented history of DVT or PE
- Family history of DVT or PE
- Leg swelling, ulcers, clots, varicose veins
- Recent (past month) pelvic or long bone fracture
- Lower extremity amputation in patients over 50 years of age
- History of, or anticipated bed confinement, immobilization over 12 hours
- Confined airground travel over 4 hours within 1 week of admission
- Spinal cord injury with paralysis
- Stroke with paralysis
- Mitral valve prolapse
- Mitral valve stenosis
- CHF
- Obesity
- Hip Fracture

Assessment Score = 9

Continue | Prev | Cancel
DEEP VEIN THROMBOSIS PROPHYLAXIS
:: Risk Factor Assessment ::

Assessment Score: 9

RISK CATEGORY: VERY HIGH RISK
(Hip Fracture / Knee Replacement / Surgery > 30 min)

Contraindications to Anticoagulation

Relative:
- History of cerebral hemorrhage
- GI, GU bleed or stroke within past 6 months
- Thrombocytopenia
- Coagulopathy
- Active intracranial lesion/synechiae
- Proliferative retinopathy
- Vascular access / biopsy sites inaccessible to hemostatic control
- Epidural catheter in place

Absolute:
- Active hemorrhage from wounds, drains, lesions
- Heparin use in heparin induced thrombocytopenia
- Warfarin use in pregnancy
- Severe trauma to head, spinal cord or extremities with hemorrhage within 4 wks
Visual aids – research orders

Nursing Glue is the "Magic" to Make Things Work
Questions?

Daniela Mahoney, RN
danielamahoney@hisorg.com

*Improving workflow and patient outcomes through customized EHR consulting.*