Innovation in Informatics

Panel Presentation
Moderated by Nelita Zytkowski, DNP, MS, BSN, RN-BC, NEA-BC, FHIMSS
Session 2 Learning Objectives

1. Discuss the important role innovation plays through an interactive discussion

2. Recognize successful models where innovation and emerging technologies have played a key role in improving workflow efficiencies and quality of care.

3. Review how nursing can play a key role in the adoption of unique and innovative solutions.
Safety Technology for Medication Administration

Pam Baker, MSN, MBA, RN, PCNS-BC
Christin Eland, RN

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Associate Chief Nursing Officer and Chief Nursing Information Officer

Christin Eland, RN
Epic Training Lead
Epic Inpatient Instructional Designer

Akron Children’s Hospital
About Akron Children’s

- Ranked a Best Children’s Hospital by *U.S. News & World Report*
- 8th largest children’s hospital in country*
- Magnet® Recognition for Nursing Excellence
- Largest pediatric provider in NE Ohio
  - 2 hospital campuses
  - 20+ primary care locations
  - 60+ specialty location
- Nearly 4,500 employees
- 750+ medical staff

*Source: 2012 Becker’s Hospital Review*
Medication Technology

• Complex system of interdisciplinary workflow and technology to provide medications to the patients
  – EMR
  – Automated Med Dispensing
  – Bar Code System

• Informatics supports the entire system
Bar Code Scanning

• With the EMR deployment in June 2012, barcode scanning for Patient Identification & Medication Administration was initiated
  – Ties orders to dispensing and to administration to the patient
    • Verifies patient ID and the medication to the order
  – Medication Error prevention efforts are escalated by:
    • Scanning of Patient ID = Right patient
    • Scanning the Medication = Right ordered Medication
      – Also Right dose at the right time/day using right route
  – Bar Code scanning does not prevent all medication errors
Medication Administration Process

1. Provider orders medication
2. Pharmacy verifies medication order & dispenses medication (ADM or manually)
3. Nurse verifies the medication order on Medication Administration Record (MAR)
4. Nurse retrieves and prepare medication
5. Nurse scans Patient ID and Medication ID
   - Verifies correctness of match of the medication planned to be administered with the order in the patient’s record and the patient
6. If no alerts of mismatch, Nurse gives medication and completes documentation
2013-2014 Patient ID Scanning Trend

2013-2014 Patient ID Scanning by Month

GOAL=95%

2013 Average: 98%  2014 YTD Average: 99%
2013-2014 Medication Scanning Trend

2013: Average 97%

2014 YTD: Average 97%
Challenges with Medication Administration Scanning

• Admission timing with need for medication
• Resuscitations at Birth or Code Blues
• Patient ID band availability
• Scan-able ID band barcode
• Bar Code missing or not available on medication
• Change in order but not medication
• Unreadable barcode on medication
• Pharmacy workload
Reasons for Not Scanning Meds: 2013

- 35% = Medication drips already infusing
  - usually an adjustment to rate or bolus.
- 24% = Pharmacy is working to correct
  - Usually a labeling or barcode change by manufacturer
- 11% = Scanner availability
- 24% = See Comments
  - Catch all category
- 6% = Other: MRI, System Down, etc
Data is shared with nurses to assist in reminding that to read alerts.
Improvement Project: More Scanners

Do Tethered Scanners Meet the Needs of the Unit?

- Agree
- Neutral
- Disagree
- Strongly Disagree

NO!
Medication Administration – Pending Workflow

Administering Medications – Med Room Prep Required

- Login to Hyperspace & open patient’s chart to MAR.
- Pull medication out of Diebold.
- Scan Medication to open administration window.
- Verify all information is correct and complete all required fields.
- Click Validate.
**Lorazepam (Ativan) injection 1.82 mg**

- **Dose**: 0.05 mg/kg x 36.3 kg
- **Admin Amount**: 0.31 mL = 1.82 mg or 2 mg/mL
- **Route**: Intravenous
- **Admin Frequency**: EVERY 4 HOURS PRN
- **Action**: Given
- **Date**: 5/12/2014
- **Time**: 1135
- **Associated Flowsheet Rows**:
  - **Intake**: IV Push Volume
  - **New Value**: Date: 5/12/2014, Time: 1135

**References**
- LexiComp
- Line at time of administration: Peripheral IV 02/04/13 Right Antecubital

**Linked Orders**
- or Group
  - Show linked group information
<table>
<thead>
<tr>
<th>Time</th>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
<th>Frequency</th>
<th>PRN</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>0700</td>
<td>Ibuprofen (MOTRIN) tablet 400 mg</td>
<td>400 mg</td>
<td>Oral</td>
<td>EVERY 6 HOURS</td>
<td>PRN</td>
<td>Pain</td>
</tr>
<tr>
<td>1100</td>
<td>Lorazepam (ATIVAN) 2 MG/ML injection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1135</td>
<td>Lorazepam (ATIVAN) injection 1.82 mg</td>
<td>1.82 mg</td>
<td>Intravenous</td>
<td>EVERY 4 HOURS</td>
<td>PRN</td>
<td>Anxiety</td>
</tr>
</tbody>
</table>

1135 Pending
• Logout of Med Room computer.
• Gather what you need, get a WOW, and go to patient’s room.
• Login to Hyperspace and **scan** the patient to open the chart.
• Click the Overdue button on the MAR to see the medications you pended.
  – You can also click on the Pended Administration.
• Make sure the information in the administration window is correct.
• The time will reflect the time the medication was pended, so change it to the current time.
• Click Accept.
• The medication will show as given on the MAR.
<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0900</td>
<td>LORazepam (ATIVAN) 2 MG/ML injection EPICRX, ADMIN: cabinet override</td>
</tr>
<tr>
<td>1300</td>
<td>LORazepam (ATIVAN) injection 1.82 mg: Dose 0.05 mg/kg/dose × 36.3 kg: Admin Dose 1.82 mg: Intravenous: EVERY 4 HOURS PRN: Anxiety 1329 Given 1.82 mg</td>
</tr>
<tr>
<td>1400</td>
<td>LORazepam (ATIVAN) injection 3.64 mg: Dose 0.1 mg/kg/dose × 36.3 kg: Admin Dose 3.64 mg: Intravenous: EVERY 4 HOURS PRN: Anxiety</td>
</tr>
<tr>
<td>1500</td>
<td>Oxygen: See Flowsheet Row: CONTINUOUS L/min: 1 LPM</td>
</tr>
</tbody>
</table>

**Monday May 12, 2014**
Improving Performance for Medication Administration Bar Code Scanning

• Work with Nurses
  – Front Line nurses = identify problems & solutions
    • Interdisciplinary Computerized Documentation Committee (ICDC)
      – Try mitigate errors in system, so alerts are meaningful
      – Task Force using lean tools are identifying workflow issues and steps to get to that future “perfect” state
  • Follow the established workflow
    – What to do when it doesn’t work
  • Encourage reporting of barriers and concerns
    – Work-arounds negate the safety measures
• Work with Pharmacy
Barcoding Beyond BCMA: Expressed Breast Milk & Blood Administration

Jill Evans RN, MSN
Manager, Clinical Informatics
MetroHealth Medical Center

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Learning Objectives

At the end of this presentation, you will be able to:

• Identify scanning technologies to make administrations of expressed breast milk and blood products safer

• Identify risk of administering wrong expressed breast milk

• Identify steps taken when wrong breast milk is administered

• Identify risk of administering incompatible blood product

• Identify signs and symptoms of transfusion reaction
Barcoding Beyond BCMA: Expressed Breast Milk & Blood Administration

• Patient safety initiative
• Meaningful Use Stage 2 (BCMA)
• HIMSS Analytics EMRAM (EMR Adoption Model) Stage 7
Expressed Breast Milk: What Is the Risk

- Increase in breast feeding
- Administration of wrong EBM
- Treated as accidental exposure
- Potential to transmit
  - HIV
  - Hepatitis
  - Cytomegalovirus
- Laboratory testing
  - Baby
  - Mom
- Psychological stress
- Mistrust in Healthcare Organization
Expressed Breast Milk: Decreasing Errors

- Technologies aiding safety
  - Tracking systems software
  - Scanning hardware
- Processes for safety:
  - Expression
    - Individual labels generation
    - Mom labeling at bedside
    - Proper BM storage
  - Administration
    - Scanning baby wristband
    - Scanning BM label

Warnings
Blood Administration: What is the Risk?

- Human Factor
- Transfusion reaction
  - Initial symptoms
- Bodily Response
  - Immune system
Blood Administration: Decreasing Errors

- Technologies aiding safety
  - Tracking systems software
  - Scanning hardware
- Processes for safety:
  - Specimen collection
    - Scan patient wristband
    - Scan specimen label
  - Blood bank
    - Scan specimen
    - Verify order
    - Scan blood products
  - Matching
    - Interface with blood bank software
    - Verifies blood administration
Use of a Mobile Application to Improve Patient Care

Danielle Dick RN, BA
Laura Drobnich Sulak RN, BSN, MS
Cleveland Clinic

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Objectives

After the presentation audience members will understand:

• How a hand held device and an application can be used in a clinical setting
• How workflow can be analyzed to determine measures of success
• How devices improve patient safety and support better patient outcomes
• Factors that influence a successful trial
Background

This innovative trial used: “Iris”

• An internally developed mobile application
• Used for vital sign entry into the EMR
• Application placed on an iPhone
• 4 month trial
Background

• Clinical Solutions Center*
• Information Technology
• Marketing & Communications
• Nursing Informatics
• Patient Care Nursing Assistants (PCNA) & Manager 5 Main: “Ideas 2 Innovation” Unit

* Rapid & iterative design of clinical improvement solutions: Software as a Service, consulting & advising and application design, build, test and validation.
Goals

• Measure clinical efficacy and safety
• Decrease transcription errors
• Support real time documentation & clinical decisions
• Enhance communication
• Test infrastructure of network
• Rapid feedback and design for app development
• Evaluating a next-generation device with specific use cases for our PCNA population (iPhone) to decrease demand on our Workstations on Wheels.
PCNA Workflow

PCNAs obtain vital signs

• Use Phillips VS4
• Print out slip and enter into EMR later
• Or use workstation on wheels to enter at that time
  – What Iris brings:
    • Immediate capture of vitals and entry into EMR
Process: Metrics

Pre: Without Device & App
- Location and user group identified
- Workflow investigated
- Vital sign entry observed
- Data analyzed for transcription error and time to enter

Post: With Device & App
- Same data components measured and data compared
- Post survey for PCNAs conducted
Iris Vitals Application Screens

Temperature

- Temperature: 36.39°C
- Source: Oral
- Date: 05/15/14 7:00 AM

Blood Pressure

- Temp: 37.00
- BP: 88/62
- Pulse: 97
- Resp: 18
- SpO2: 98
- Pain: 8

Irritants: 0
Blood Products: 0
## Outcomes - Safety

<table>
<thead>
<tr>
<th>PCNA Iris Vitals</th>
<th>Range of Time Delay of VS Entry</th>
<th>Average of Time Delay of VS Entry</th>
<th>Transcription Errors</th>
<th>Time Columns in EMR Not Reflecting Real Time Doc Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Use of Application on Hand Held Device</td>
<td>0-53 Minutes</td>
<td>7.35 Minutes</td>
<td>6/65</td>
<td>20/65</td>
</tr>
<tr>
<td>After Use of Application on Hand Held Device</td>
<td>0-1 Second</td>
<td>0.3 Seconds</td>
<td>0/65</td>
<td>0/65</td>
</tr>
</tbody>
</table>

- Decreased Transcription Time
- Accuracy
- Communication

Pre N= 65
Post N= 55
Iris Vitals PCNA

Vitals Collection to Documentation

Time between Vital Sign & Entry (minutes)

Transcription Errors

Pre N= 65
Post N= 55
# PCNA Survey Results

<table>
<thead>
<tr>
<th>Feedback</th>
<th>Average</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>I liked using iPhone and app to enter vital signs</td>
<td>4.4</td>
<td>Agree</td>
</tr>
<tr>
<td>Entering vital signs was easy</td>
<td>4.2</td>
<td>Agree</td>
</tr>
<tr>
<td>Afraid of breaking the iPhone</td>
<td>3.6</td>
<td>Agree</td>
</tr>
<tr>
<td>Easy to learn to use app and iPhone</td>
<td>4.3</td>
<td>Agree</td>
</tr>
<tr>
<td>Device easy to read</td>
<td>4.5</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>iPhone app saved me time</td>
<td>4.2</td>
<td>Agree</td>
</tr>
<tr>
<td>Able to document accurately with iPhone</td>
<td>4.2</td>
<td>Agree</td>
</tr>
<tr>
<td>I recommend continued use</td>
<td>4.3</td>
<td>Agree</td>
</tr>
</tbody>
</table>
What We Heard

“Felt like I could enter vitals 20x faster than normal. I love the idea of using these iPhones.”

“...took less time to enter the vitals on the iPhone as compared to entering on the WOW, did not have to take the “heavier” WOW into the room.”

“Saved Overtime!”
What worked

• Leadership support
• Immediate feedback loop
• Rapid design & collaboration - onsite
• Communication of project team important
• Enhancements during trial
• Excitement & engagement
Lessons Learned

- Improved work flow & time savings
- Size works in tight physical environment
- PCNAs used without prompting
- Staff appreciated developer response
- Changes intuitive - easily accepted
- Patients & families liked it

Opportunities

- Remediate for real time documentation
- Technical support for Wi-Fi
- Establish project risk escalation process
- Address disinfection of devices
- Isolation workflow
- Identify devices as hospital property
Summary

This presentation explored:

- How a hand held device and an application can be used in a clinical setting
- How workflow can be analyzed to determine measures of success
- How device use can improve safety of patient care to support better patient outcomes
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Special Thanks to the Project Teams & Members

Teams: Clinical Solutions Center, Marketing & Communications, Information Technology, Hillcrest 5 Main, Cleveland Clinic Nursing Informatics

Members: Kristen Bacik, Rob Bauer, Danielle Dick, Matthew Drew, Laura Drobnich Sulak, Karen Engell, Suzanne Fink, Michael Kondis, Beth Meese, Dr. Will Morris, Tom Taconet, Nelita Zytkowski
Discussion
InNoVaTioN Table Exercise

1. As a table group: Read the case scenario

2. Identify a scribe to take down your team’s idea

3. Discuss innovative solution(s)

4. Draw, describe, or write out your innovation

5. Identify a person to report out your innovation (2 minutes max)
   - Explain why this innovation is important to nurses

GET CREATIVE!