Improving Patient Care Outcomes Through Technology

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Topics and Objectives

➢ Technology as Tools
  ➢ Objectives:
    ➢ To discuss the role of medical devices in the past.
    ➢ Describe the early relationship between Nursing and Clinical Engineering

➢ Current Trends in Technology
  ➢ Objectives
    ➢ Review the current trends related to device integration, medication safety and clinical decision support tools.
    ➢ Review the impact on patient care outcomes and the nursing-clinical engineering evolution

➢ Looking to the Future
  ➢ Objectives:
    ➢ Described the drivers of change
    ➢ Explore the future outlook of technology and the impact on evidence generated medicine.
    ➢ Describe the future partnership between nursing and clinical engineering related to patient care improvements
Kaiser Permanente

- 37 Hospitals
  - All EMR Stage 7 Award
- 8 Regions
- 456 MOB
- 8.9M Members
- 16,000 Physicians
- 46,000 Nurses
Devices in the Past

- **Patient Care Use**
- **Snapshot of Information**
  - Fetal Monitors
  - Blood Pressure Cuffs
  - Glucose Testing Devices
- **Patient Care Outcomes**
  - Treat the device
  - Limited impact on improvements to patient care outcomes
  - Measurement accuracy
Clinical Engineering and Nursing: Our early relationship

- Situational Relationship
  - Device specific need
  - Problem solving
  - Maintenance
  - Pieces were dropped, broken, wires frayed
  - Minimal opportunity for collaboration
Influences in the Evolution of Technology

- Demands for Improvement in Patient Care
- Regulations Requiring Advances
  - Meaningful Use
  - EMR Bill
- Consumer driven demands
- Calls to Action by Professional Groups
- Key Initiatives
  - Fall Prevention
  - Pressure Ulcers
Opportunities

25%
Of manually documented vital signs have one or more errors

Source: CIN: Computers Informatics, Nursing July/August 2010, Wager, Schaffner

120 minutes
Average latency of entering vital signs and other clinical data in to KPHC

Source: KP Data Analysis & Capsule

$17 billion
Annual estimated cost of measurable medical errors in the U.S.

Source: Health Affairs April 2011, Van Den Bos, Rusteg et.al.

27%
Percent of nursing time spent on documentation

Source: The Permanente Journal/ Summer 2008/ A 36-Hospital Time and Motion Study: How Do Medical-Surgical Nurses Spend Their Time? Hendrich, Chow et.al. Volume 12 No. 3 25

The cost and complexity of today’s clinical environment provides ample opportunity for improvement in efficiency, safety and care.

KP’s efforts should target those areas where the greatest impact can be realized.
“Time and Motion” Study Findings

- 7% of a nurse’s time is spent on patient assessment
- 17% of a day shift nurse’s time (median) is spent on medication administration
- 35% of a nurse’s time is spent on documentation
- Day shift nurses spend about 30.8% of their time in patient rooms with all of their patients
- Care Coordination 20.6%

KP’s Call to Action

How might we disruptively innovate and transform the inpatient work environment to enable simple, reliable patient care delivered by nurses and their inter-professional partners through the wise use of data, analytics and information technology?

KP Smart Care Goals

- Simplify the nurse’s path
- Support the nurse with knowledge
- Reduce the nurse’s non-value add tasks
- Develop a vision for the nurse of the future in an advanced technical environment
Current Work

- **Goals**
  - Improving Efficiencies
  - Improving Safety
  - Improving Patient Experiences
  - Improving accuracy
  - Providing information at the right time for the right patient
KP SmartCARE Priority Focus Areas

Clinical Transformation

Rapid Sign-On
Eases the burden and repetition of logging-in to the EHR every few minutes

Clinical Intelligence
Provides cognitive support and real-time contextual information

Workflow Automation
Manage tasks, schedules and events

Mobility

Biomedical Device Integration (BDI) captures patient data automatically resulting in real-time, accurate, easily available patient information. BDI is foundational to the KP SmartCARE Strategy.

* Reference Appendix A: SmartCARE Components
* Source: Kaiser Permanente Annual Report 2010
** Prioritized as the #1 most urgent technology need to support nursing efficiency at the Nursing SmartCARE vision session**

**Options**
- Facial Recognition
- Contact free Smart Chip Badge
- Palm Vein Authentication
- Fingerprint Sensors
- Radio Frequency Identification

**Facts and Benefits**
- Nurses log on up to 80 times per shift
- Log takes up to 15 seconds
- Rapid Sign-on solutions can save more than 11 seconds per log-on
- This saves 12.8 minutes/shift/nurse, 834,182 hours annually

**Update**
- Stakeholders from Patient Care Services, KPIT, AIMI, KP HealthConnect, Clinical Informatics attended vendor session 12/5/2011
- Functional, technical & security requirements prioritized
- Business Case development and technical recommendations 1/2012
Mobile Vital Signs: Value Proposition

Acute Care Integration of Vital Signs Using Capsule Neuron:

- Enables validated documentation into KP HealthConnect in real time.
- Allows immediate access to physicians preventing care delays. (Current state 120 min latency)
- Eliminates duplicate documentation; current state is documenting on paper then KP HealthConnect
- Improves accuracy (25% of manually documented VS have 1 or more errors).
- Reduces non-value added tasks and increases time for nursing direct care activities
- Allows vital sign documentation to be a by-product of patient care.

Update:

- **Nursing Workflow Session** conducted with frontline nursing staff (across KP) at the Garfield Center.
- **Proof of Technology** successful at the Garfield Center
- **Pilot** planned for Q1 2012 at Sunnyside Medical Center in the NW
- **Pre-pilot metrics** collected 1/16/2012
- **Performance Improvement** team organized to attain front line clinician involvement and develop quality, safety and efficiency outcome metrics
LVP (Large Volume Pump)

- Smart Device
- Data
- Integration
- Safety Software
  - 2500 Drugs
  - Hard Stops
  - Decision support
- Quality Improvement
Improvements to Patient Care Outcomes

- Devices not only collect information in a snapshot:
  - Collect information
  - Store data
  - Provide additional safety through software
  - Integrate with other devices as well as the EMR
    - Real time data at the point of care
    - Decision support
    - Improved safety through accuracy with identification and medication administration
Our Evolving Relationship

- Advances in technology drive additional relationship encounters
- Increased complexity of technology leads to:
  - Thought Partners
  - Change Influences
  - Integrated
- Improvement requires
  - Will
  - Ideas-generated by all disciplines
  - Execution-requires all parties to participate in order for success
Looking to the Future: Top Devices Integration Options

We propose integrating the top 12 devices (30% of install base) across the enterprise that are most clinically important, widely used, and prone to error during manual entry.

**Integration Strategy**

Prioritize devices which:
- Represent *regional high priority*
- Provide *real time, critical patient information*
- Require the *most documentation time* from nurse
- Potentially cause the *most errors* due to manual entry

**Top 12 Devices**

- Physiologic Monitor
- Ventilator
- Infusion Pump
- Vital Sign Monitor
- Anesthesia Machine
- EKG Holter
- EKG Management System
- Hemodynamic Monitor
- Arterial Blood Gas
- Non-invasive Blood Pressure
- Pulse Oximeter
- Fetal Monitor

*1 Top 3 devices provide the highest clinical benefits.*
Potential Gains

Biomedical device integration is foundational to the Nursing SmartCare Strategy

- Improved patient Experience (care quality and patient outcomes)
- Increased Nursing job satisfaction
- Improved nurse workflow efficiency
- Provide more complete, accurate, real-time data for KP’s information Assets, which leads the way to:
  - Evidenced Bases Practice
  - Clinical Research
  - Evidence generated Medicine
- Standardized Clinical Technology Support
**Significant Evidenced Based Outcomes**

Hospitals effectively engaging patients are realizing measurable outcomes

<table>
<thead>
<tr>
<th>Service Excellence</th>
<th>Quality and Safety</th>
<th>Financial</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.6 % improvement in Med Teaching Top Box Score</td>
<td>67 % Reduction in Falls per 1000 patient days</td>
<td>34 % reduction in bed turnaround time</td>
</tr>
<tr>
<td>12.9 % improvement in Pain Control Top Box Score</td>
<td>15.3 % increase in hand hygiene compliance</td>
<td>7.7 % reduction in average length of stay</td>
</tr>
<tr>
<td>19.3 % improvement in Staff Responsiveness Top Box Score</td>
<td>50 % Reduction in Heart Failure Readmissions</td>
<td>$ 914,000 in retail pharmacy revenue</td>
</tr>
<tr>
<td>26 % increase in Room Cleanliness Top Box Score</td>
<td>50 % reduction in Pediatric Asthma Readmissions</td>
<td>17 minute nursing time savings per patient</td>
</tr>
<tr>
<td></td>
<td>97.8 % increase in PN AB Care Measure</td>
<td>$ 319,000 in savings due to fall reduction</td>
</tr>
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Patient Room of the Future

A personalized patient room which provides an intuitive, real-time and integrated experience for patients, family and care givers.

Advanced Tools

- Interactive Patient Care Systems for self-service activity and patient care plan involvement to address Meaningful Use
- Location and proximity
- RFID*
- Bed alarms
- Interactive, touchscreen monitors

*N Radio Frequency Identification

Nursing Mobile Device

- Intelligent coordination between agents
- Decision support
- Automated documentation
- Reminders and escalations
- Task status awareness through visual alerts
PATIENT ROOM of the FUTURE
Saving Lives

The names of the patients whose lives we save can never be known. Our contribution will be what did not happen to them. And, though they are unknown, we will know that mothers and fathers are at graduations and weddings they would have missed, and that grandchildren will know grandparents they might never have known, and holidays will be taken, and work completed, and books read, and symphonies heard, and gardens tended that, without our work, would never have been."

Donald M. Berwick, MD, MPP
Former President and CEO
Institute for Healthcare Improvement
Through Partnership Great Things are Possible

Questions?