

UPMC
LIFECHANGINGMEDICINE

**Is There Such a Thing as Too Much
Technology and Too Little Patient Care?**
21st Annual Summer Institute In Nursing Informatics
July 2011

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Objectives

- Review the current technology facing nursing today
- Examine the future role of nursing in the electronic medical record and how it relates to quality
- Evaluate how many clicks are too many clicks and review a process improvement on documentation optimization
- Examine overbuilt systems and alert fatigue
- Assess how we design for the next generation

How much is too much technology?

- Electronic medical record, RFID systems, infusion devices with decision-support software (smart pumps), bar coding system, asset tracking software, bed board, simulation, computers on wheels, PDAs, smart phones, delivery robots, patient monitoring, call bells, eICU, telehealth, etc.....



PrakInkt Tracking :: All Placements - Microsoft Internet Explorer provided by Tele-Tracking Technologies

PrakInkt Tracking :: All Placements

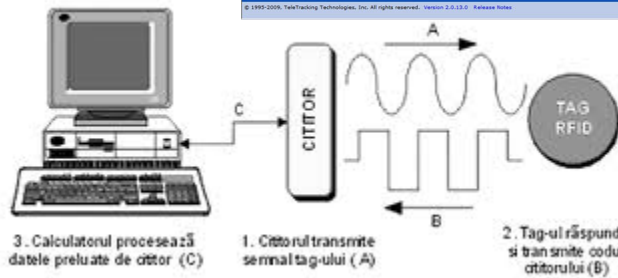
Home Help StaffTracking TransportTracking Admin Tool Reports

All Placements: 30:00 AM 2 Resources 7 Assignments 4 Unassigned 13

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Can robots do it better?

- “Nurses don't need to schlep bandages and food--robots can do it better and cheaper, figures **Aethon**, a Pittsburgh-based developer of mobile robots that use radio frequency identification technology to track and fetch medical supplies.” (<http://technicalstudies.youngester.com/2008/08/new-technologies-that-will-change.html>)



The growth of technology

- 1980's to present:
 - computers in healthcare, safer medication administration, patient safety monitoring devices; EMRs/EHRs; wireless charting devices; robotic assistants; clinical decision-making tools and telehealth services
- 1990's:
 - Burns Wean Assessment Protocol/Program (BWAP) to wean patients off ventilators; Perioperative nurse invents Omni-Jug for drainage of arthroscopic fluid, the Puddle Guppy that aspirates fluid from hospital floors and the Aqua-Box that disinfects fluid waste prior to sewage disposal; blood draw protector called Med Search Hand Guard (or hemoshield); Bath-Bag; Bili-Bonnet
- 2000's:
 - eMAR medication bar coding; Cardibra for female post-op cardiac patients; Wireless devices: PDAs, Hand-held Computers, Smart phones, RFID systems, robots used for meal delivery, hospital lab deliveries, & pharmacy, automated census boards, SMART ROOMS



Electronic Medical Record

Role of the Electronic Medical Record

- Record keeping is an essential element of practice
- Serves as a legal record
- Standards for the nursing content of electronic records are essential for
 - patient safety
 - to support best practice
 - reduce duplication of effort
 - quality improvement
- **Goal for the EMR is to possess every bit of information about a patient in one centralized place**

EMR and Nurses Documentation

- Nurses are expected to document innumerable facts:
 - vital signs as often as every 15 minutes
 - turning a patient on his side
 - fluid intake and output
 - Medications
 - IV patency
 - pain questionnaires
 - safety checks
 - dressing changes
 - physical assessments
 - ETC.!!!
- Many nurses end up staying overtime after shift ends just to enter in all the data of their day = costs to the hospital both in terms of money and job satisfaction.

Benefits of the EMR

- Clinical decision support systems, which may facilitate medical decision-making and provide evidence-based recommendations
- Handwriting translation
- Works in conjunction with another valuable technology tool i.e. electronic medication administration records often tied to barcode technology
- Alert of the patient's risk of falls or remind her to ask further questions
- Alerts for patient precautions and allergies are visible in a banner bar
- Record history like personal maintenance of chronic conditions that can then be shared with a physician or nurse practitioner
- Computerized provider order entry systems (CPOE)
- Orders for prescriptions (“e-prescribing”)
- Computerized reporting of test results
- **Long Term Goal: to mine data for provider analytics regarding the practice of patient care**

Electronic Medical Record/Value Based Purchasing

- In our current payment structure, physicians and hospitals get paid for the service they provide, not how well the patient does or how effective the treatment has been
- In the future, hospitals and physicians will not get paid for treatment for adverse outcomes that are because of "never events" (i.e., events that should never occur).
- A major driving factor for healthcare IT is the adoption of electronic medical records (EMR).
- Agency for Healthcare Research and Quality (AHRQ) studies have indicated that EMRs can help control costs and improve safety by making patient data more accessible.

Value Based Purchasing

- Affordable Care Act (ACA), Section 3001
 - CMS will launch the first national Hospital Based Purchasing-Pay-for Performance program
 - Effective date: FY 2013 payment for discharges on or after October 1, 2012
 - Criteria
 - Must be a hospital inpatient quality reporting program participant
 - Meets quality metrics by demonstrating improvement or high levels of achievement
 - FY2013 Medicare payment based on quality measure performance
 - 5 clinical topics
 - Acute Myocardial Infarction, Heart Failure, Pneumonia, Surgeries, and Hospital Acquired Infections (HAI), HCAHPS patient survey

Value Based Purchasing (VBP)

Value-based purchasing (VBP), which links payment more directly to the quality of care provided, is a strategy that can help to transform the current payment system by rewarding providers for delivering high quality, efficient clinical care

http://www.cms.hhs.gov/AcuteInpatientPPS/downloads/hospital_VBP_plan_issues_paper.pdf



Value Based Purchasing (VBP)

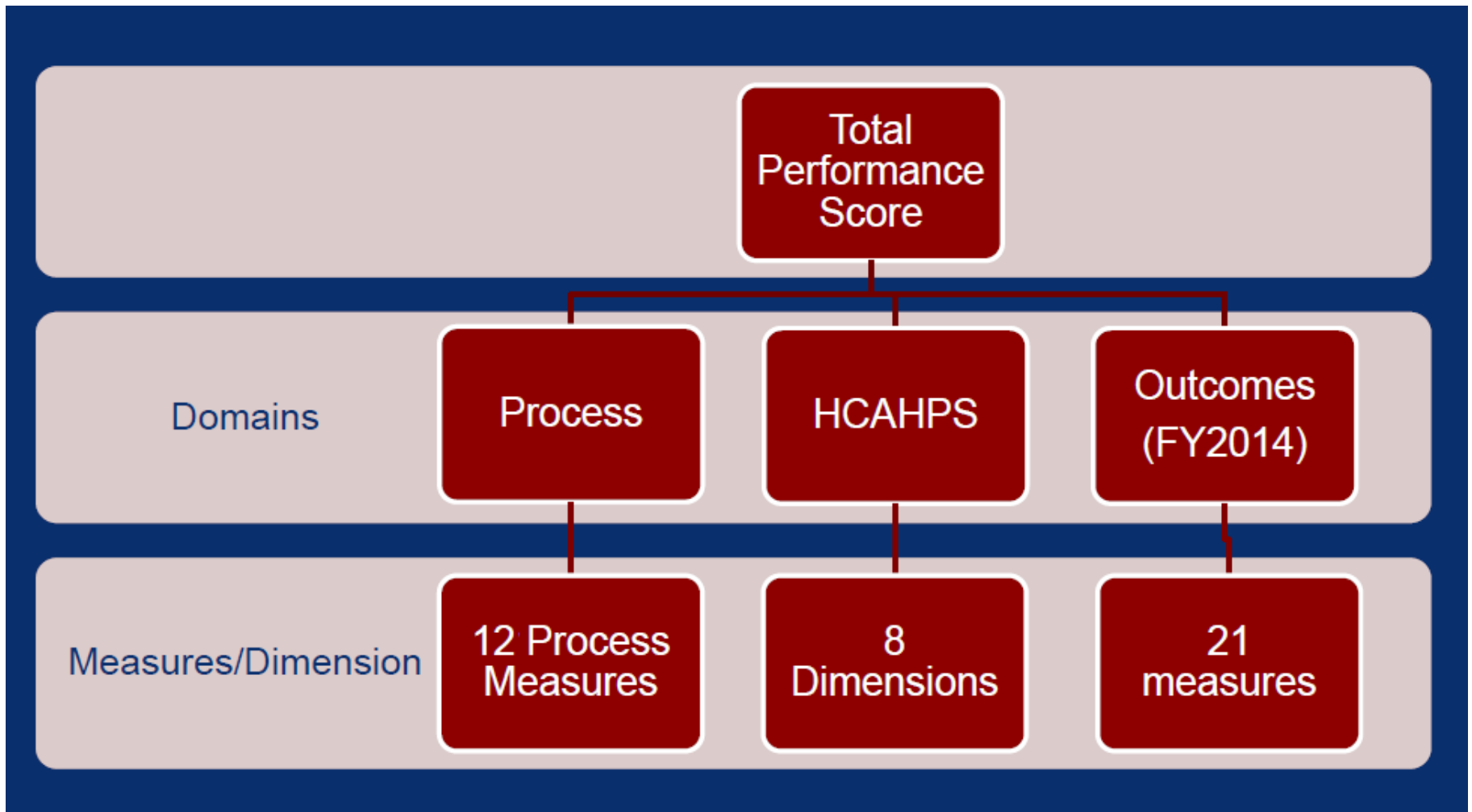
- Recognize the highest quality and most efficient care
 - **Berwick:** “Let’s define efficiency as making sure that every dollar you spend gets a dollar of value back, so that efficiency is the opposite of waste. Right from the start, it has been one of the great illusions in the reign of quality that quality and cost go in opposite directions. There remains very little evidence of that. There may be some innovations that raise cost while raising quality, but many, many improvements reduce costs.” (Excerpts; *Health Affairs*, January 12, 2005)
- Create competition based on quality and efficiency
- Drive improvement and innovation across the healthcare system
- Enable patients and their care givers to choose the best available option
 - “We have really good data that show when you take patients and you really inform them about their choices, patients make more frugal choices. They pick more efficient choices than the health care system does.”

(Dr. Donald Berwick, Administrator of the Centers for Medicare & Medicaid Services)

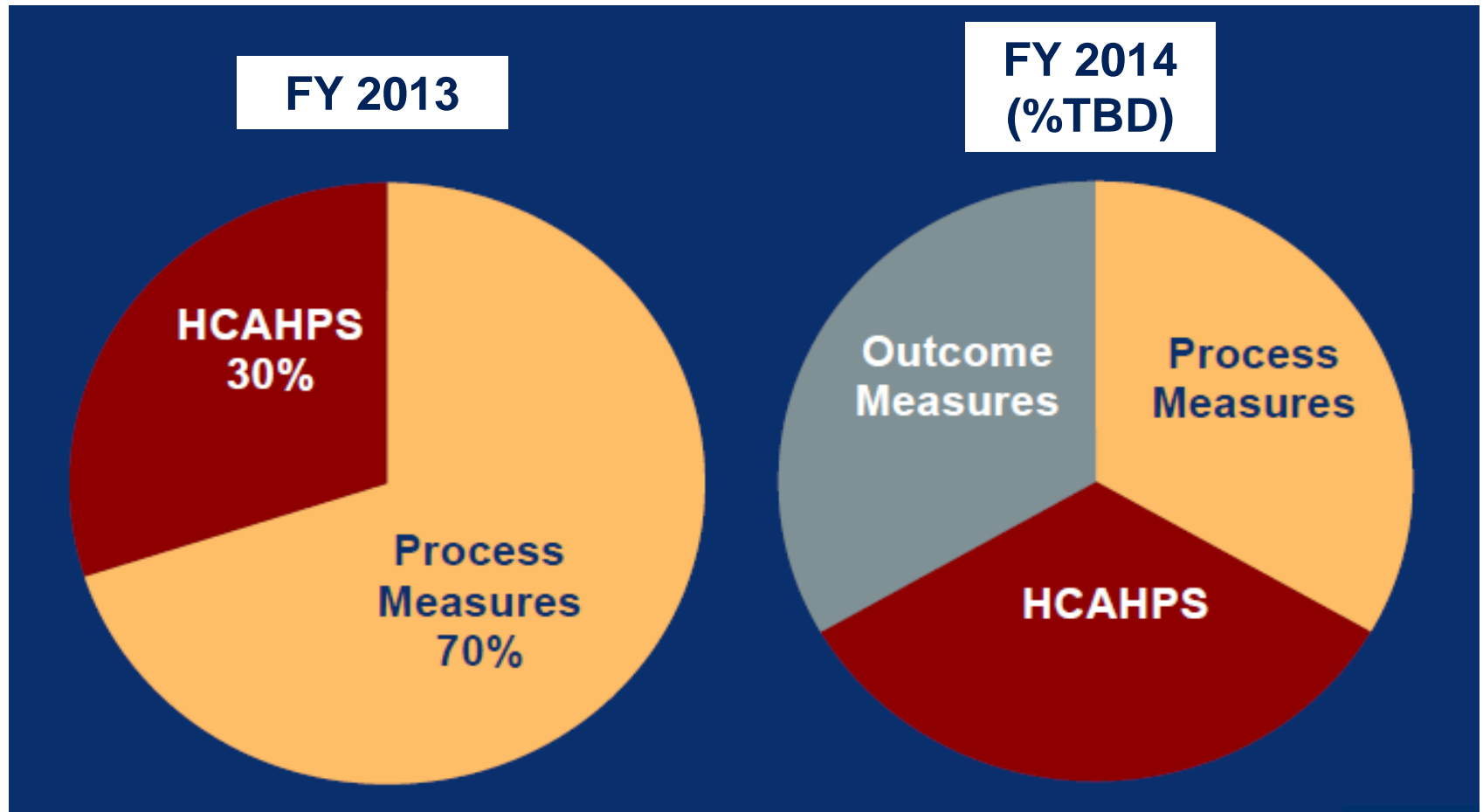
Challenges of VBP

- To achieve high levels of performance on the clinical measures and patient satisfaction
- Satisfaction surveys used by CMS to gauge quality
- The Hospital Acquired Condition (HAC) payment adjustment provision
 - provides a different kind of financial incentive (or disincentive) by decreasing reimbursement
 - requires that hospitals code claims to indicate primary and secondary diagnoses (including potential HACs) that are and are not present on admission (POA).

Structure of VBP Scoring



Patient Care Domains



FY2013 Clinical Process Measures

Condition	Measure
Heart Attack	Fibrinolytic therapy received w/in 30 minutes of hospital arrival
	Primary PCI received w/in 90 minutes of hospital arrival
Heart Failure	Discharge instructions received
Pneumonia	Blood culture performed prior to administration of first antibiotic
	Initial antibiotic selection for CAP in immunocompetent patient
Healthcare-Associated Infection	Prophylactic antibiotic(s) one hour before incision
	Prophylactic antibiotic stopped within 24 hours after surgery
	Cardiac surgery patients with controlled 6am post-op serum glucose
	Appropriate Antibiotic Selection

FY2013 Clinical Process Measures

Condition	Measure
Surgical Care Improvement	Surgery patients on beta blocker prior to arrival who received a beta blocker in the peri-operative period
	Surgery patients with VTE prophylaxis ordered
	Surgery patients who received VTE prophylaxis within 24 hours prior to surgery to 24 hours after surgery

FY 2013 HCAHPS Dimensions

HCAHPS Dimensions

Nurse communication

Doctor communication

Cleanliness and quietness

Responsiveness of hospital staff

Pain management

Communication about medications

Discharge Instructions

Overall rating

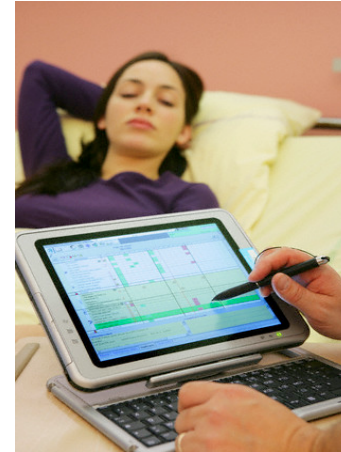
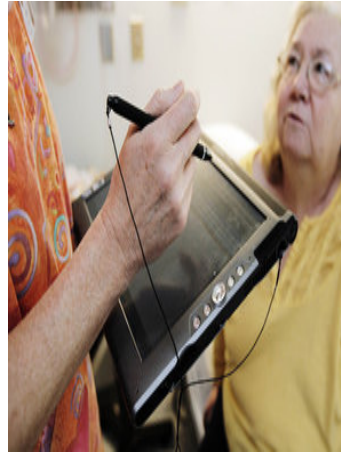
Additional Measures for FY2014

Type	Measure
Hospital Acquired Conditions	Foreign body retained after surgery
	Air embolism
	Blood incompatibility
	Pressure Ulcer Stages III and IV
	Falls and Trauma
Mortality	30-day mortality (AMI, HF, PN)
Efficiency	<u>Spending per beneficiary</u>
AHRQ	Mortality for selected conditions composite score
	Complication/patient safety for selected indicators composite score

Areas of Focus

- Strive to be perfect for clinical measures
 - Actionable data/reporting at level of the clinician on core measures
- Improve HCAPHS scores
- Reduce Readmissions
 - Actionable data/reporting on inpatient resource utilization/costs of inpatient care redesigns
- Educate and begin to improve HAC/PSI measures

Example: Process Improvement for Reducing the Number of 'Clicks' by Nurses by the EMR



Documentation Optimization

Goal:

Reduce the number of mouse clicks, computer scrolls, and screens needed to document clinical data will create more time for the UPMC nurses to provide direct care at the bedside and work with patients and their families.

Operating Principles:

- Simple
- Direct
- One way (or just a few)
- Design driven by actual staff
- Interdisciplinary
- Written to rule not the exception
- Decision making oversight – consensus may not be possible
- Reduce the number of “clicks” to reach charting fields

Work:

- **Informatics' nurses worked on redesign with the eRecord team by collaborating with facility staff bringing ideas for redesign and consensus with decision making for the below sections with phases of work.**
- **Simplified documentation**
- **Conditional logic: simplify view and drop down i.e. right and left now able to document in one boxed field vs. opening 2 boxes therefore reducing clicks & more direct.**
- **Triggers: field used to automatically open what other documentation applies to the trigger.**
- **Dynamic (repeatable) groups: label that will pull forward with documentation.**

Phase I: 11/17/2010

- Patient summary for adult and infant
- Neuromuscular assessment adult and infant
- Cranial nerves
- Spinal cord
- Respiratory
- Musculoskeletal
- Invasive puncture site care
- Assessment and PACU bands

Phase II: 12/11/2010

- Skin
- Rename wound and skin band to burn
- Gastrointestinal
- Genitourinary
- Reproductive
- Cardiovascular
- Edema
- Cardiac rhythms/pacing

Summary Comparison Pre & Post Metrics Doc Op Adult Daily Physical Assessment 5.19.2011

Pre Metrics Range ICU & MS (8/2010)

Click	56 - 193
Double Click	0 - 15
Scroll	0 - 24
Tab	0 - 25
Type	0 - 17
Time	2:31 - 10:08

Post Metrics Range ICU & MS (4/2011)

Click	53 - 147	↓
Double Click	1 - 10	↓
Scroll	0 - 7	↓
Tab	0 - 36	↑
Type	2 - 7	↓
Time	1:13 - 6:46	↓

Total Time Savings Range Pre to Post

Minimum time (min : sec): 2:31 down to 1:13 = **52% reduction**

Max time (min : sec): 10:08 down to 6:46 = **33% reduction**

Operating Principles: Simple, Direct, One Way, Designed by staff, Interdisciplinary, Written to rule not exception, Decision making oversight, Reduce number of screens & mouse clicks to reach charting fields, 30% reduction in charting requirements.

Phase I go live: 11.7.2010

Phase II go live: 12.11.2010

Nursing Measurement Outcomes

Daily Physical Assessment

Measure	Before	After	% Change
Number of fields on initial view	176	133	- 24
Number of fields that could be added via Customize View	256	95	- 63
Number of dynamic groups	29	34	0.07
Total number of fields	461	320 (141 fewer)	- 31

Other Work That Has Been Done

Bedside Medical Device Interface BMDI

Pre	Post	Reduction
15 clicks	3 clicks	80 % clicks
17 seconds	4 seconds	77 % time

Blood Witness

Pre	Post	Reduction
10 clicks	5 clicks	50 % clicks
31 seconds	18 seconds	42 % time

Overbuilt Systems and Alert Fatigue

Bells, Ringing, Beeps....Alert Fatigue

- Alert fatigue occurs when health care providers are inundated with alerts to the point that they begin to ignore them
- Prolonged alert fatigue can negatively impact patient care as true alerts may be ignored
- EMR Alerts known as "pop-up" fatigue can result in over-riding alerts
- Alerts are good – we need to decide what are the right alerts!

Why have alerts?

- Health care facilities can be high hazard workplaces!
- The volume of information an average provider must remember is too much
- Patient Safety is number 1!
 - Precaution Alerts
 - Bar Scanning
 - Pumps
 - Monitors



A Sample of Alerts

Alerts/Warnings List

- all pulmonary emboli
- all readmissions to medicine within 7 days
- death summary reports
- all deaths- a list within 24 hours
- all pediatric admissions
- all pediatric operations
- all dictated code reports
- patients with los > 45 days
- all conditions C and A in people not admitted [visitors, employees who are sent by code team to the ED]
- all patients started on ECMO
- patients with trachs which require attention by respiratory therapy
- all placements of inferior cava filters [to remind people to remove them]
- patients with difficult airways-then placed in yellow banner bar
- patients on insulin pumps which diabetic consults take care of
- reports of patients who aspirate
- patients on warfarin and heparin combined
- all patients who are paraplegic or quadriplegic-who are prone to respiratory deaths and are seen
- patients at risk for C. diff by computer diagnosis
- patients with C. diff toxin [therefore warnings not sent by me to this group who are frequently discharged and do not have routine follow up-most do but some do not-not done for past 2 weeks
- patients on hypoglycemic drugs
- patients with low blood glucose
- patients on methotrexate
- patients who have transfusions post cardiac cath [I remind cardiology to find out why-looking for preventable groin bleeds

EMR Alert Fatigue

We need to evaluate:

- Efficiency
 - Minimize clicks or keystrokes to deal with the alert.
 - Offer the alternative options on the alert screen.
- Usefulness
 - Is it accurate: Did it fire for the right reason?
 - Fire only with current orders, not when you place an order for a future lab or X-ray.
 - If a second line antibiotic is used, the physician probably has a reason. They don't need to be reminded it is a second line antibiotic.
- User Interface or Presentation Mode
 - Specifics must be displayed (e.g., “mammography due” not “health maintenance reminder”).
- Workflow
 - Timing of the alert is key. Have it fire at the point of action, not upon opening the chart. Most alerts should fire during ordering tasks, not in charting tasks, so issues can be addressed in the exam room while the patient is still present. Additional charting can take place after the patient is gone.

Assessing for the next generation

Nursing is a critical part of the future of patient care and organizations committed to providing high-quality patient care.

Rebecca Hendren
Nursing's Growing Role
HealthLeaders Media



What do nurses want?

According to Dr. Carol Bickford of the ANA (2005), nurses want tools that help with patient-centered care including:

- **Stronger collaboration between manufacturers and nurses when designing tools for care delivery**
- **Better software integration; i.e., biometric fingerprinting/eye-scanning of nursing personnel, to save time and numerous log-ons/log-offs**
- **Charting devices that allow for the telling of each patient's "story" of care instead of individual system updates; i.e., a "whole person" view**
- **Continued emphasis on self-directed learning through Web-based training programs**
- **The Best of Information Technology (IT): intuitive interfaces, wireless connectivity, seamless integration of software applications and the ability to access data when and where it is needed**

Technology: Too Much?

- What we want: nurses to use informatics in practice to provide safer, high-quality patient care
- What we don't want: layering of technology so that nurses are being taken away from the bedside

The Importance of Nursing in Changing Times

- Nurses are essential to positive outcomes in all areas of health care quality
- Nurses spend the greatest amount of time in delivering patient care as a profession
- Nurses are an essential part of the health care delivery system
- Nurses make up the single largest segment of the health care work force
- We have valuable insight and unique abilities and understand the care processes across the continuum of care
- Without nurses, any effort to improve health care quality in our country and implement health care reform will fail!!!

Robert Wood Johnson Foundation Initiative on the Future of Nursing at the Institute of Medicine

- The report said that nurses should be "full partners" in the redesign of U.S. healthcare including in the areas of management of chronic conditions, primary care, prevention and wellness, and prevention of hospital-acquired infections.
- Four key messages :
 - Nurses practice should reflect their educational level.
 - More nurses should pursue higher levels of education through an improved system.
 - Nurses should be "full partners" in the redesign of U.S. healthcare.
 - Better data collection and information infrastructure are needed for planning work force and policy changes

Robert Wood Johnson Foundation Initiative on the Future of Nursing at the Institute of Medicine

- Nurses are ready
 - to help bridge the gap between coverage and access
 - to coordinate care for a wide range of patients
 - to fulfill their potential as primary care providers to the full extent of their education and training
 - to enable the full economic value of their contributions across practice settings to be realized
- Nurses are crucial in preventing medication errors, reducing rates of infection, and even facilitating patients' transition from hospital to home.

"When I saw central line infections plummet, and when I saw breakthroughs in patient- and family-centered care, I knew there would be a nurse there"

(Dr. Donald Berwick, Administrator of the Centers
for Medicare & Medicaid Services)

Robert Wood Johnson Foundation Initiative on the Future of Nursing at the Institute of Medicine

- The Future of Nursing report is intended to support efforts to improve the health of the U.S. population through the contributions nurses can make to the delivery of care.
- They are not necessarily about achieving what is most comfortable, convenient, or easy for the nursing profession.



Summary

- Technology is changing and quickly
- Nurses are on the forefront of redesigning patient care
- Understanding the right alerts that avoid alert fatigue
- Design for the next generation - Nurses have the power to make a difference – my challenge to you ... Be the difference!



“...the time is ripe for nurses to take a bigger role in healthcare.”

Dr. Donald Berwick
(MedPage Today Blog; 12/1/2010)

Questions?

Resources

- Value-Based Purchasing Non-Payment for Hospital-Acquired Conditions; Authors: Kathy A. Jankowski, Walt Zywiak and Jane Metzger
- Walker, Emily. Berwick Gives Nurses Some Love | December 01, 2010
- HEALTH CARE REFORM AND INCREASED PATIENT NEEDS REQUIRE TRANSFORMATION OF NURSING PROFESSION (<HTTP://WWW8.NATIONALACADEMIES.ORG/ONPINNEWS/NEWSITEM.ASPX?RECORDID=12956>)
- **The Future of Nursing: Leading Change, Advancing Health** (2011)
Institute of Medicine ([IOM](#))
- http://www.nursezone.com/nursing-news-events/devices-and-technology/The-Endless-Nursing-Benefits-of-Electronic-Medical-Records_24676.aspx
- Technology And Nursing: Past, Present and Future Perspectives
- Physicians and EMRs: A look at clinician attitudes and behaviors; February 2011 (<http://www.aapcps.com/news-articles/mpd-physicians-emrs.aspx>)