

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Unifying Content for Electronic Inpatient Health Record

Paulette Fraser MS, RN-BC  
Project Manager for Acute Care Documentation  
Brigham and Women's Hospital

Ann McDermott MS, RN  
Project Manager for Acute Care Documentation  
Massachusetts General Hospital

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Brigham and Women's Hospital and Massachusetts General Hospital as members of Partners Healthcare System began a journey to create one electronic health record based on evidence based content. With a vendor selected, the process of identifying, designing and validating all content was undertaken during several all day sessions attended by representation from all clinical specialties at both organizations.

As the content validation and approval process continues several frameworks have been implemented to facilitate the build of one way documentation between the two organizations. These components include the establishment of a joint content approval body, organization specific content committees, content manager position at each facility to manage existing and new content and change process requirements.

Multidisciplinary authoring teams were created to identify and resolve any differences between sites or clinicians. These authoring teams are depicted with the timeline and steps involved in the completion of build for each category list. We balanced the authoring endeavor with alternating lead membership from each hospital. The authoring teams consist of a Content Coordinator, a build analyst, and a knowledge-management staff person. Discussions during the authoring group sessions apply the terms to workflow-driven screens which are posted in an online document and discussion repository for subject matter experts (SME) to approve.

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## Impact of 12 hour Shifts on Patient Safety and Medication Administration

Mary Logan MSN, RN, BC, Marlene Dufault PhD, RN,  
Mary Kelly BSN, Koren Palmisani BSN

Newport Hospital

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**Purpose:** To determine the impact of 12-hour shifts on nurse and patient safety, a systematic evidence synthesis was conducted to determine the effect of nurse shift length on patient safety, medication administration and nurse satisfaction. Theoretical Framework: Rogers adoption-of-innovations theory and Dufaults Collaborative Research Utilization Model guided potential policy changes

**Methods:** A four-stage evidence synthesis was conducted. First, 8 nursing students guided by faculty, clinicians, librarians, and quality and information experts, searched, reviewed, and critiqued the evidence. Search strategy (1988-2009) included research, clinical practice guidelines, and grey literature from databases of Cochrane, PubMed, and CINAHL. Second, a strength-of-evidence summary table was constructed. Third, senior leadership students directed by the Clinical Informatics Nurse Manager conducted retrospective reviews of 80 medication errors/near misses occurring during 2008-09 in this 148-bed Magnet community hospital. Variables examined included error location, length of shift, number of consecutive work days, between-shift recovery time, recommended staffing levels and time of day. Software utilized in the retrospective review included Siemens Invision system, Quadramed Transparent Classification Acuity system and One Staff scheduling system. Fourth, a sample of nurses who routinely work 12 hour shifts were interviewed.

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## A Nursing Workflow Observation Tool for Evaluating Implementation of a Clinical Nursing Documentation System

Kumiko Ohashi RN, Ph.D. Research Fellow  
Carol Keohane BSN, RN Program Director,  
David Bates MD, M.Sc, Angela Benoit,  
Denise Goldsmith RN, MPH, Patricia Dykes RN, DNSc

Brigham and Women's Hospital

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**BACKGROUND:** Many hospitals have implemented electronic health record (EHR) systems. However, the degree of EHR adoption varies by hospital. The next stage of adoption at our academic medical center is the implementation of acute care documentation (ACD), an electronic clinical documentation system. In preparation for implementing ACD, we developed a set of evaluation measures to be used to assess the impact of ACD on nursing practice and patient care. One component of these measures was practice efficiency and how nurses spend their time pre and post implementation of the ACD system. In this research, we describe the process of developing the nursing workflow observation tool as a means to record and measure nursing activities before-and-after implementation of ACD.

**METHODS:** A workflow observation tool was developed to quantify the time nurses spend on different types of care activities, such as direct, indirect (documentation) and other unit-related tasks. The tool is based on a tool used for previous time motion studies at BWH and is designed to identify changes in the amount of time spent on different types of care activities pre and post implementation of ACD. Modifications were made to measure nursing activity before-and-after ACD implementation. Nursing intervention categories were redefined based on the Clinical Care Classification (CCC) System which provides a standardized framework and a unique coding structure for assessing, documenting and classifying patient care. The workflow evaluation tool was built on a Microsoft Access database on touch screen laptop computers. Observed nursing activities are selected by observers, and the system records activities and time spent on each activity. Pilot tests were conducted on two different patient units at BWH with two observers who are registered nurses to examine usability of the tool and comprehensiveness of categories for capturing nursing care activities. A one-hour observation was conducted at each of the two patient units.

**RESULTS:** From the test observations, we found that the tool captured most actions. The observers confirmed to what extent the data were captured correctly and corresponded to their observations. Intervention categories were reorganized slightly after the first set of observation sessions to facilitate capture of related elements. Overall, the operation of the system was easy and data capture was complete. Regarding selecting documentation activities using the tool, the current electronic documentation was separated from paper based documentation categories, allowing us to track both computer and paper based documentation time distributions.

**CONCLUSION:** Through the process of modifications and pilot tests, we developed a nursing workflow observation tool. Improving nursing workflow will likely be central to improving the efficiency and quality of nursing care. We plan to conduct a time motion study using the observation tool to evaluate the impact of ACD implementation, and the results will be used to refine our approach to ACD.

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## Electronic Pain Management Documentation Tools

Theresa Jasset MSM, RN, CNOR Nursing Informatics Coordinator  
Kathleen Clement BS, RN Nursing Informatics Coordinator

New England Baptist Hospital

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New England Baptist Hospital in Boston, MA performs over 12,000 orthopedic procedures annually. With the high degree of musculoskeletal pain experienced by this population, pain management is a major focus of our care. The 2009 Joint Commission standards mandate that hospitals assess and manage patient's pain with an element of performance that includes reassessment of patient's pain. Our current electronic medical record system assists nurses to meet this standard. Within our facility, patients experience two typical pain patterns: chronic or acute. To thoroughly describe and record our patient's pain, we have established 3 distinct electronic pain assessments with corresponding reassessment documentation when indicated.

- 1.Q Shift Pain Assessment: For patients who are not experiencing current acute pain or instead, suffer from chronic pain. This complies with our hospital standards that every patient has a pain assessment at least once a shift.
2. Pre/Post Pain Treatment Assessment: For surgical patients who are experiencing acute pain as a result of their surgical procedure. This captures both the pre pain assessment as well as the post assessment after an intervention has been performed. Complimentary modalities for pain management, such as cold therapy, are also included as pain management techniques and charted as nursing interventions. To assess effectiveness of pain management activities, we have general guidelines that pain be reassessed 60 minutes after oral medication therapy and 30 minutes after intravenous/subcutaneous/intramuscular therapy.
- 3.Pain Control Devices: Many surgical patients are prescribed patient controllable analgesia devices or are administered nerve blocks perioperatively.

The goal for patients who have these is a more consistent level of pain control. Therefore, we have termed an additional pain score called Pain Device Score to distinguish between a pain devices effectiveness and supplemental medication or treatment that may be also required. The computer system prompts nurses when assessments or reassessment are due to allow for documentation at regular intervals as determined by our hospital standards. Many of the queries offer an electronic choice of responses to assist in standardizing language and serve as a template leading to more complete documentation. To facilitate a more meaningful use of this rich data, our electronic system synthesizes all of these pain scores onto one easily accessible pain scale graph. This allows for trending capabilities of the data into a comprehensive and robust depiction of a patient's response to pain treatment efforts. Caregivers have had a favorable response to these tools and often use them as a guide for treatment decisions which ultimately lead to improved patient outcomes.

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## Keeping It Simple

Laurie Anderson RN, BSN, MIS  
Clinical Informatics Project Manager

Lynne MacAllister RN, BSN, CPHIMS  
Director Clinical Informatics

Southern New Hampshire Medical Center

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When Developing Nursing documentation for an EMR in a hospital environment the challenge becomes how to get all the information you want to capture without overwhelming your nursing staff.

Our concept of "keeping it simple" was to involve nurses in assessment content to allow staff nurses to drive the level of documentation. By streamlining the process into what documentation was required, and what nurses may document we were able to develop concise, comprehensive assessments that decreased documentation times.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Using SharePoint as a Portal to Connect Educator and Staff Nurses

Ronna Zaremski RN, MSN, CCRN  
Clinical Nurse Educator

Brigham and Women's Hospital

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Working on a busy medical intermediate floor, staff nurses are exposed to frequent changes. These changes include, but are not limited to: updates in the computer order entry system, adjustments in the electronic medication administration record, introduction of new or different pieces of equipment, new policies or specific unit changes. Educators use various forms of technology to inform their nurses of these changes. E-mail is a quick and easy method of communication, but it also has limitations. Accounts have limited capacity, which translates into text e-mail, with few attachments. Word and Powerpoint are used to create posters or learning packets, but again, due to the size of the files, these items are often printed out and hung on overfilled bulletin boards. The hospital system has created a number of electronic resources which are accessible via the hospital intranet. The layout of these resources was recently reorganized for improved navigation, but there still are an overwhelming number of resources.

The hospital purchased the Microsoft program SharePoint a few years ago. Any group who desires to create a web-based communication portal can register for a site. The staff were informally approached to assess if they thought a SharePoint site would interest them. The overwhelming response verbally was to go ahead and create a site specifically for the staff nurses. The site content was established in August 2008 and is organized and maintained by the Educator. Small focus groups were held to review the content during the first few months. Suggestions were heard and improvements were made. The portal now serves as an important link between unit changes and hospital resources. It is essentially an extension of the Educators hard drive. Any important tip, which will benefit the staff, is placed on the site in a logical place, along with links to the hospital sites. We have integrated topics such as National Patient Safety Goals, our acuity system, our falls program to name a few. Often attachments are added to for those individuals who are visual learners. Using this site for the staff nurses has reduced the number and size of emails. User accounts no longer become over the limit, which allows important messages to be received instead of bouncing back to the sender. Staff bulletin boards are now clean, with just the most updated and important posters attached to them. These changes were made to help establish a healthier overall working environment. No utilization reports have been created to establish actual usage. Occasional emails are sent to remind the staff to use the portal. There are some limitations to the site. Staff nurses can only access the site via the intranet. Many nurses informally stated they would use it more if they could access it from home computers. It does not necessarily fit into the daily workflow for the staff nurses. Despite these limitations, the SharePoint site is a practical use of technology that supports frontline nurses as they do their work.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Development of Automated Quality Reporting: Aligning Local Efforts with National Standards

Patricia Dykes DNSc, MA, RN  
Christine Caligtan MA, RN, Debra Thomas RN  
Linda Winfield RN, Gianna Zuccotti MD, MPH,  
Roberto Rocha MD, PhD

Brigham and Women's Hospital

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As providers and systems move towards meaningful use of electronic health records, the once distant vision of data reuse for automated quality reporting may soon become a reality. To facilitate consistent and reliable reporting and benchmarking beyond the local level, standardization of both electronic health record content and quality measures is needed at the concept level. This degree of standardization requires local and national advancement and coordination. The purpose of this poster is twofold;

- 1) To review national efforts that can be leveraged to guide local information modeling and terminology work to support automated quality reporting.
- 2) To report on efforts at Partners HealthCare to map electronic health record content to inpatient quality metrics and terminology standards and to align local efforts with national initiatives.

Recommendations are made to support data reuse for the purpose of inpatient performance measurement and quality reporting based on established national standards and identified gaps.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Improving Patient Education Documentation While Implementing an Interactive Video Technology System

Ann Furey RN, MBA Patient Education Program Director  
Karen Reilly RN, MBA Nurse Director, Beth Baldwin RN, BSN

Brigham and Women's Hospital

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**Purpose:** To assess if patient education documentation can be improved through the creation of practice guidelines while implementing an interactive video technology system.

**Background:** Patient education is a key component to disease management, convalescence, and overall wellness maintenance. The Joint Commission requires that all aspects of patient education be documented including the assessment, the teaching plan, the evaluation of patient learning, and recommendations for further teaching. The hospital purchased an interactive TV video system which allows nurses to prescribe patient education videos to patients.

**Methods:** Practice guidelines were developed by the nursing staff. They defined the patient education process and subsequent documentation needed at admission, during each shift, and upon discharge. Train the Trainer model was used. Nurse trainers provided 1:1 training to staff nurses 24/7 for a two week period. Manager provided support and follow up by rounding daily and responding to issues and providing feedback to staff nurses in real time. Evaluation included tracking utilization, nurse satisfaction, patient satisfaction, and conducting a chart audit to assess documentation of teaching and learning.

**Outcome Measures/Results:** Patient Education documentation was improved. An audit of 75 charts revealed an increase in patient education documentation from almost zero to: Learning needs documented 56% of the time. Teaching goals documented 77% of the time. Evaluation of learning documented 66% of the time.

**Practice Implications:** Practice change is not automatic with the introduction of a new technology. Practice change can be successful by scheduling the initial training and then a follow up training to reinforce practice.

**Lessons Learned:** Success factors needed for implementing new technology to staff nurses: Technology must be easy to access by staff nurses and patients, and must fit into the nurse's workflow. Timely responses to staff nurses (end users) feedback and issues is required to increase nurses confidence and satisfaction

Success factors needed for changing practice: Strong partnership with nurse manager and patient education program is essential. Practice guidelines need to be developed by the end users. Strong nurse manager commitment to process. Reinforcement of practice guidelines was needed through reeducation

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## The Impact of Nursing Unit Design on Staff and Patients at a Magnet Hospital

Mary Kennedy MS, RN Director, Clinical Informatics  
Nicholas Watkins HOK, PhD Director of Research  
Maria Ducharme MS, RN, Cindy Padulla PhD, RN

The Miriam Hospital

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### **Purpose**

The purposes of this study were to compare existing nursing units, with different design features, using data collected on patient and staff experiences; measure the direct and indirect impacts of clinical informatics and architectural design on patient care activities, workflow, patient satisfaction, adverse events and efficiencies; and use baseline results to inform design features of future nursing units.

### **Framework**

Clinical informatics solutions and architectural design innovations, that reflect the Institute of Medicines Six Quality Aims, provided the study framework.

### **Methods**

The study design was descriptive. Participants included nurse managers, registered nurses, certified nursing assistants, and patients in an acute care setting. During Phase 1, nurse managers completed a questionnaire asking them to describe the staffing, equipment and spaces on his or her nursing unit. During Phase 2, staff filled out an internet-based questionnaire asking them to share their perceptions and experiences while on the nursing unit. The staff's patients were given a different questionnaire asking them to share their perceptions and experiences while on the nursing unit. Patients needed to be 18 years of age, cognitively intact, and needed to agree to participate. During Phase 3, PDA handheld devices were used to observe staff's work behaviors and locations. At the end of the shift, staff completed an End of Shift questionnaire via the Internet. This survey asked questions specific to the nursing unit on which care was provided. Inferential statistics including factor analysis and analysis of variance (ANOVA) will be used to analyze the data.

### **Results**

Results will be presented and described.

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## Collaborative Communication Tool

Dorothy Bradley RN, MSN Nursing Program Director  
Julianne Nee AS Administrative Assistant

Brigham and Women's Hospital

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At the Brigham and Women's Hospital (BWH), Boston MA, a primary mission of the Center for Nursing Excellence (CNE) is to integrate education, evidence, research, professional development and technologic innovation to support clinical nursing practice, nursing workflow, patient care and scholarship. This is accomplished, in part, through consultation, educational programs and projects, given the nature of our mission a department of Nursing Future Search was assembled to envision the future of the nursing department and steps to reach that vision. Out of this assembly a communication task force was charged with examining opportunities to improve our processes of communication and finding solutions to

1. increase the efficiency, accuracy and exchange of information between CNE and members of the Department of Nursing
2. to facilitate scheduling and tracking educational needs and required educational courses of clinical nurses and
3. to coordinate a schedule for deployment of new technology and the requisite training.

The CNE Sharepoint site was developed by first creating a task force of key stakeholders. This group included nurse directors, educators and operation supervisors. These end users were instrumental in providing information in creating a site so that it would be meaningful, intuitive and comprehensive. Requirements for material included on the site were defined and vetted by the task group and nursing leadership. The site was then designed with objective inclusion criteria. The site consisted of specific sub sites: Directory and Resource; Orientations; Educational Resources; Nurse Recognition; Diversity; Global Nursing; Nursing Simulation; and Schools of Nursing. Under each sub site are informational resources, courses, registration rosters and attendance as well as schedules of every technological initiative or upgrade that would impact nursing. A three month pilot was trialed on a unit from each division to obtain hospital wide feedback. We evaluated the utility, accessibility and number of visits to the site. Overall, evaluations were extremely positive. Advantages of this site include flexibility; each end user can access information whenever and from anywhere within the partners network. Instructors can now collaborate easier, independently identify their class registrants which facilitates communication and allows them to prepare and resource their classes more efficiently. Human Resources, Information Systems and Nursing are now able to visualize the necessary information in real time which supports interdepartmental coordination. This site now functions as an effective communication tool across all areas of the hospital and has the potential for expanding the accessibility of the nursing electronic resources to the broader BWH community.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Relieving the Pressure of Wound Care Consult Referrals

Kathleen Maiorano RN, BSN Information Systems Analyst  
Debra Dulac MBA, RN, BC, CPHIT Director, Nursing Informatics  
Peter Nolette RN, CWCN, BSN, MBA

Dartmouth-Hitchcock Medical Center

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**Problem:** Wound care consult referrals were missed or delayed due to inconsistent methods of communication. This resulted in untreated wounds, delayed treatment and poor outcomes in wound healing.

**Solution:** Streamline the wound care referral process through the use of existing functionality in the current electronic health record (EHR).

A work group was convened by the Clinical Information Systems Analyst, at the request of the Wound Care nurses, to analyze the issues and create a solution. The group consisted of the Wound Care nurses and the CIS analyst with the support of the Director of Nursing Practice at Dartmouth-Hitchcock Medical Center. A referral workflow process was developed using the Tasklist work queue functionality in the EHR that was currently successful in the ambulatory care setting. The workflow was trialed by the group and released organization wide. A Wound Care Consult, work queue was created that would be managed by the wound care consult nurses. A Consult task, containing the required information established by the wound care nurses, would be created by the referring unit staff and sent via the Tasklist routing functionality to the Wound Care Consult Queue. The wound care nurses monitored the queue, triaged the tasks, marked each task with their icon and followed up with the referring unit by sending the completed consult note to the Tasklist. The Task remains on the Patients Tasklist throughout the episode of care as well as post discharge if appropriate. The consult note is part of the electronic health record so others who would be interested in the content, have it available to them as well. It was critical to promote and communicate the adoption of this new process to anyone who needed the Wound Care Specialist services. An Educational tool was created by the CIS Analyst and distributed via the Professional Nursing Network following an announcement from the Wound Care nurses. Voice mail messages were modified to direct nursing staff to use the CIS Tasklist. Email notifications were altered to reflect that the change in practice that consults would only be done electronically and that the process was now standardized. There was not an opportunity to opt out and the staff was provided the education and support to embrace the change in process.

Staff acceptance of this practice change incorporating the use of technology to communicate, task and document wound care was profound. Even though this process was considered of small scope, it engaged the nurses who were hesitant to use technology to now request that additional consults, communication be done using the CIS Tasklist. Efforts are underway to explore how this automation can be extended to the vascular access team, etc.

**Results:** The integration of this referral workflow into nursing practice resulted in timely and no missed referrals, earlier interventions, appropriate treatment resulting in improved outcomes in wound healing, shorter stays and improved patient satisfaction.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Patients Flow, Hand-offs and Medication Safety

Marsha Haverly MS-C, RN CPAN PACU Educator  
Michele Creamer MSN, CNL-BC Clinical Nurse Leader, Cardiac Cath Lab  
Mary Kennedy RN, MS, Christine Timoney BSN, RN, OCN  
Catherine Gordon RN, BSN

The Miriam Hospital

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**Introduction:** The Miriam is a 247 bed University affiliated teaching facility and three time Magnet Designee. This hospital has successfully implemented many Point of Care technologies including physician order entry (POM), medication administration check system (MAK) a bar code administration (BCMA) and clinical documentation systems.

Healthcare delivery systems are more complex today than ever before from both an operational and technical perspective. There are immense pressures to improve patient flow, keep our Emergency Departments open and move patients into areas where they can receive the appropriate level of care. This often means moving patients and inpatient systems, operational and technical, into areas that have a different primary care focus. In addition, medication errors have been recognized as the most common cause of medical errors. Four hundred thousand preventable drug related injuries occur annually in hospitals, resulting in an estimated 3.5 billion dollars of extra medical costs (National Academy of Sciences, 2006). A breakdown during the medication administration process is one of the leading causes of these medication errors (Institute of Medicine, 2006). This abstract will describe the ways one organization implemented Bar Code Medication Administration (BCMA) outside the traditional medical-surgical areas to optimize care.

**Method:** BCMA (MAK) was implemented into a variety of Patient Holding areas (ie. Emergency Department, Cardiac Catheterization Lab, Post Op Recovery and Oncology Cancer Center) to improve medication safety and optimize care. The primary project goals were to 1) eliminate paper med labels, 2) implement BCMA and 3) improve the quality of patient hand-offs. We also believed that BCMA would enhance both direct and indirect patient communication. The implementation process took approximately 6 months. Transitioning to computerized medication administration system required workflow analysis and re-design, equipment acquisition, staff training and post implementation evaluation. One of our biggest challenges was addressing nurses concerns about the BCMA system in their practice areas and revising their current workflow.

**Results:** Successful integration of MAK with current systems has resulted in the ability to access the medication administration record across inpatient and procedural units. This allows patients to receive routine medication while holding in these units. Paper medication labels have been eliminated and there is better on-line access to patient information.

**Analysis:** The BCMA implementation has been a success. We continue to work with staff to address workflow and system issues. System enhancements will be disseminated to staff as they are identified and become available.

**Discussion:** Moving forward we will include the new areas in our current medication safety metrics as well as complete yearly competency verification in the future. Staff Nurses continue to comment on the challenges of using many different systems in a single care area. As clinical information systems continue to evolve and become more widely accepted, we will need to look at clinical systems integration from a care delivery and clinical communication perspective.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Getting to the Core of Vaccine Compliance

Diane Burrige RN, MS  
Sr. Clinical Systems Analyst

North Shore Medical Center

New England  
Nursing Informatics  
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### INTRODUCTION

This poster presentation displays the use of electronic assessments to assist clinicians in completing Pneumonia and Influenza screening in adult patients admitted to North Shore Medical Center. Screening patients for vaccine administration at North Shore Medical Center has been paper based and an opt-out protocol.

### BACKGROUND

In May 2001, the Joint Commission announced four initial core measurement areas for hospitals, which included pneumonia. The initial pneumonia measure set contained 5 measures one of which is Pneumococcal Screening and/or Vaccination. The implementation of Influenza Vaccination as a measure was implemented in 2004. Pneumococcal and Influenza screening are not all about the number for core measures.

Pneumococcal pneumonia is a preventable disease that continues to cause substantial morbidity and mortality among seniors. There are approximately 100,000 hospitalizations and 7,000 deaths per year from pneumococcal pneumonia, with a disproportionate representation by older adults 65 years and older. Evidence studies of Pneumonia vaccination show overwhelming support of administering the vaccine for patient meeting criteria. The vaccine is 40% effective in preventing pneumonia in high risk patients. Additionally vaccinated patients who develop pneumonia have a reduced risk of death and bacteremia, as well as shorter hospitalizations. Annual influenza epidemics continue to be a leading cause of morbidity and mortality in the US adult population. Annual influenza vaccination is the most effective method for preventing influenza virus infection and its complications. There is a 50% reduction in the rate of pneumonia, hospitalization, or death in patients receiving influenza vaccine.

### METHOD

NSMC completed Pneumonia and Influenza vaccine screening on paper until a new electronic screening was implemented on May 11, 2010 as part of a new assessment application for nursing. The new assessment includes help screens for the user to identify high risk conditions qualifying a patient for the vaccines. Most importantly we were able to generate vaccine orders based on screening criteria. The order crosses to CPOM (computerized physician order management) through the Pharmacy system into Medication Administration Check (MAK) for administration to the patient the next day at 10 am. The assessment has logic to ensure the screen is completed once initiated. Users receive notices to complete all screening questions before they can move off the screen. In compliance with Center for Disease Control, Patient Can't Remember and Patient Unresponsive do not eliminate the screening process. We also provide screening status information for nurses by displaying this (complete or incomplete) in their shift rounds URR). The date of previously administered vaccine as reported by the patient/family date will display for all users in the Patient Factors screen.

### RESULTS

While too early to measure success, the goal of the medical center is to ensure screening is completed on all inpatient admissions and those who meet screening criteria and do not have contraindications or decline, will receive a vaccination.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Improving Safety and Interdisciplinary Communication at the Point of Care: Evaluating and Re-designing An Alcohol Withdrawal Management Program

Michelle Carpentier BSN, RN Nurse Manager  
Martha Watson MS, RN Professional Development Specialist,  
Mary Kennedy MS, RN

The Miriam Hospital

New England  
Nursing Informatics  
Consortium

<http://www.nenic.org>

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**Introduction:** The Miriam is a 247 bed University affiliated teaching facility and three time Magnet Designee. Staff nurses on one of the medical units identified a potential patient safety issue related to conflicting orders generated from the electronic CIWA [Clinical Institute Withdrawal Assessment alcohol revised (CIWA-ar)] order set. The Nurse brought it to the Nursing Practice Council, one of the core councils within our shared governance practice model.

Earlier in 2008, The Joint Commission published Sentinel Event Alert #42, Safely implementing health information and converging technologies and stated that overall safety and effectiveness of technology in health care ultimately depend on its human users, ideally working in close concert with properly designed and installed electronic systems (1). This alert specifically recognized the relationship and inherent risks associated with technology and care delivery. In addition, TJC suggested a number of actions to reduce the likelihood of harm to patients in the technology rich healthcare environment. Specifically the need to re-assess, monitor and evaluate to health information technology and care practices for any unintended consequences.

This poster presents one case scenario where nurses, challenged by conflicting alcohol withdrawal orders, re-designed a workflow process and on-line order sets to enhance patient care, safety and communication between clinicians.

**Methods:** A multidisciplinary task force (Nursing, Clinical Informatics, Professional Practice Development, Psychiatry and Information Systems) was convened and a 3 part plan was developed to: 1) assess, redesign and approve a new order set; 2) revise a CIWA documentation tool and 3), develop an education and communication plan.

**How it was accomplished:** A chart audit was completed and validated the risk for error. Order set changes were recommended, approved and built using new technology features, a new documentation tool developed and the changes endorsed by appropriate professional practice councils.

**What was accomplished:** The documentation tool was piloted with overwhelmingly positive feedback. Revised order sets were implemented in March 2010 and an education program rollout was completed. A new care plan was also developed and implemented. Patient care has been improved and orders are now clearly communicated.

**What lessons learned:** Identification of this patient care and practice issue by a group of staff nurses provided the impetus for change. Nurses role in CPOE is vital to safe patient care. Staff Nurses can drive improved nurse satisfaction, medication safety and patient safety. Utilizing a multidisciplinary approach is important to change management and should be continually used as new practice issues are identified.

(1) The Joint Commission. Sentinel Event Alert: Safely implementing health information and converging technologies. (Issue 42, December 11, 2008)  
Retrieved from

[http://www.jointcommission.org/JointCommission/Templates/GeneralInformation.aspx?NRMODE=Published&NRNODEGUID={ADB79BF6-00D6-456A-9570-107676091C9B}&NRORIGINALURL=%2fSentinelEvents%2fSentinelEventAlert%2fsea\\_42.htm&NRCACHEHINT=Guest%20-%203](http://www.jointcommission.org/JointCommission/Templates/GeneralInformation.aspx?NRMODE=Published&NRNODEGUID={ADB79BF6-00D6-456A-9570-107676091C9B}&NRORIGINALURL=%2fSentinelEvents%2fSentinelEventAlert%2fsea_42.htm&NRCACHEHINT=Guest%20-%203)

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Development of a Collaborative Patient Discharge Documentation Module

Lauren Selvitella RN, MSN  
Nursing Project Manager Acute Care Documentation  
Marcy Carty MD, MPH  
Director of Clinical Operations Improvement  
Christina Pelletier

Brigham and Women's Hospital

New England  
Nursing Informatics  
Consortium

<http://www.nenic.org>

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### Introduction

The Brigham and Women's Hospital (BWH) Discharge Documentation Module was developed to replace and improve the hospital's legacy application which was unable to sustain further expansion.

This project was an opportunity to improve clinician communication, collaboration and efficiency. We created an accurate and concise discharge plan for all patients, as well as a smooth handoff for their providers in the home, facility or physician office.

### Methods

Our design process began with an examination of Press Ganey scores and existing discharge documentation. After examining current state workflows and interviewing BWH and tertiary care providers, we found many areas to improve.

Our project management trajectory consisted of an Agile and Waterfall hybrid methodology. We met once a month with our Steering Committee and held weekly work group meetings to determine the vision, look and feel, functionality and content of our application. We recruited clinician representation from multiple disciplines to take part in bi-monthly workgroups. We devised screen options in advance and then presented them to clinicians for feedback. Based on their suggestions, developers created screen shot style mock-ups which were then vetted at the following meeting for validation. The information and enthusiasm staff shared in these groups shaped our design from the aesthetic to the content and functionality.

### Results

We fashioned our screen designs to reflect our culture of interdisciplinary collaboration. Each discipline has an independent section for documentation of their unique contribution to patient discharge care as well as interdisciplinary screens shared with other clinicians. This design eliminates duplicative and erroneous data entry, while fostering communication amongst caregivers.

Our experience has shown us that patients do not always comprehend clinician instructions upon discharge. Therefore, we created our output documents from the patient's perspective. We de-mystified their care plan with the use of diagnosis based patient and provider instructions, medication reconciliation screens, comprehensive provider contact list, medication grid and clear follow up appointment summary.

### Discussion

We look to be a discharge application trendsetter by developing an integrative model that not only improves patient outcomes but also fosters clinician practice. We have learned many lessons as our project progressed; a major hindrance we found was scope creep. A more thorough assessment of all clinicians future expectations before our Charter was signed may have alleviated some of our challenges in keeping in scope. We also believe that our clinician workgroups may have been more efficient if we had held more frequent, sub-group meetings, inviting only a core of expert clinicians who would have the most to contribute to the topic of discussion. This targeted approach would have resulted in a more efficient decision making process and a more expedient development phase.

With improved patient instructions, education and documentation of hospitalization, we are providing an easy to read, comprehensive discharge tool that strives to enhance a patient's confidence when being discharged from our hospital.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Meaningful Use at the Bedside: A Perspective from the Staff Nurse at a Magnet Organization

Iracena Lopes BS, RN Staff Nurse, Chris Tucci RN Staff Nurse

The Miriam Hospital

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### Background

Incorporated into the 2009 American Recovery and Reinvestment Bill, was Title XIII which is better known as the HITECH act (Health Information Technology for Economic and Clinical Health). This is a focused initiative to encourage hospitals and providers to adopt information technology. The goal of the HITECH act is to provide better access to healthcare information, provide greater coordination and transparency to such information as well as improve the over all quality of patient care.

The technology goals are really a means to the following: Improve quality, safety, efficiency, and reduce health disparities; Engage patients and families; Improve care coordination; Improve population and public health; Ensure adequate privacy and security protections for personal health information.

In addition to laying out a framework to accomplish these goals, financial incentives and penalties have been defined to encourage organizations to meet these goals within the next 5 years.

As a proud recipient of three magnet awards, The Miriam Hospital strives to empower staff through shared governance. The Clinical Informatics Committee (CLIC) is an integral part of this model and looks to enhance patient care and professional practice through informatics. The Clinical Informatics Committee (CLIC) is one of 2 councils currently chaired by staff nurses at The Miriam Hospital. This council was charged with the primary responsibility of disseminating information about meaningful use and strategies for technology adoption, for solutions used by Nurses, throughout the organization.

### Purpose

To successfully adopt information technology solutions as prioritized, demonstrate meaningful use, improve patient care and enhance the environment of care in the previously determined time frame. The initial meaningful use projects impacting Nurses included but were not limited to on-line VS, bar code medication administration in holding areas, and clinical documentation.

### Impact

Chairs of the shared governance clinical informatics council were directly involved in systems workflow analysis, project planning, testing, training and support and specifically those tasks related to clinical assessments and progress notes. Clinical staffs were frequently updated as clinical informatics committee members disseminated information thru each nursing unit. They directly involved staff nurses and other end users to provide feedback, validate and trouble shoot system design issues and made suggestions to the Lifespan Information Technology (IT) team. They also worked and supported a variety of strategies to disseminate information including council meetings, message boards, and working with the Chief Nursing Officer to provide meaningful use content for staff communications.

### Conclusions

As implementation of electronic documentation will affect all patient care providers, early dissemination of information, the involvement, and empowerment of bedside registered nurses is crucial to success. Early involvement will assist in anticipating and reducing problems prior to implementation and increase adoption.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Bar Coded Medication Administration: Improving Medication Safety and Patient Safety through a Unit Based Medication Safety Program

Cristina DaCosta BSN, RN Staff Nurse  
Joseph Gordon-Renzar BSN, RN Nurse Manager  
Mary Kennedy MS, RN

The Miriam Hospital

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Nursing Informatics  
Consortium

<http://www.nenic.org>

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### Background

The Miriam Hospital, a three-time Magnet award designee, successfully implemented a closed loop medication process in 2007. An important component of this system is the Bar Code Medication Administration system (MAK) that nurses use to ensure the five rights of medication safety- right patient, right drug right dose, right route and right time. This system has been critical in the prevention of medication administration errors. Yet the system does not completely eliminate the potential for errors as nurses can override the patient's identification barcode, the medication barcode and omit a dose of medication completely.

### Method

The Department of Nursing and Pharmacy collaborate to produce monthly quality reports. Data is collected automatically from the bar code medication administration system, analyzed and emailed to nurse managers reporting specific occurrences for individual nursing units. The 3 West inpatient ward identified the need to decrease the amount of patient and medication barcode overrides and decrease the amount of omitted medication doses, to ensure that the electronic medication administration system was being utilized to its fullest potential. Nursing staff were educated on these monthly reports via staff meetings, emails, and a medication safety bulletin board. The dissemination of these monthly occurrence reports to the nursing staff was a key component to decreasing omitted medication doses, patient and medication barcode overrides.

### Results

Since posting and reviewing this data with nurses, the total number of patient ID overrides has decreased from 201 overrides in January 2009 to 37 overrides in December of 2009. The relative difference of omitted medication doses has decreased from 2.8 in August of 2009 to 1.3 in February 2010, demonstrating the effectiveness of sharing these monthly data reports with nurses directly.

### Analysis

Through the process of sharing this data with the nurses, we believe a new level of accountability in administering medication was attained, and the understanding that the delivery of medication through the electronic medication system does not ensure that errors will not occur. Information technology, quality reports, interdisciplinary partnerships and direct feedback to staff can significantly improve medication safety and the delivery of safe patient care.

### Recommendation

The 3 West inpatient ward has been successful implementing a quality program that they hope to bring to the rest of the organization as a medication and patient safety best practices.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Improving Flu and Pneumonia Vaccination Rates

Marie George RN, MSN Manager of Nursing Informatics

Rhode Island Hospital

New England  
Nursing Informatics  
Consortium

<http://www.nenic.org>

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### Introduction:

This large urban teaching hospital was challenged with finding a way to improve influenza and pneumonia vaccine administration rates among inpatients. This abstract describes the implementation of a mix of process and technology innovations to achieve that effect.

### Methodology:

An assessment of the barriers to ordering and administering vaccines to hospital inpatients was performed. Barriers identified included physicians who were resistant to the idea of giving vaccines during hospital stay, and nurses who lacked the time to obtain an order for vaccine administration during patient discharge.

In the first phase of the project, with eventual buy-in from the Physician Chiefs, a nursing protocol was created that allowed the nurse to order and administer the vaccine through use of a screening tool at discharge. After the protocol was implemented, a second phase of the project automated the protocol by use of an interface script so that it is auto-ordered for all patients who fit certain age criteria on admission. For flu vaccine, the script runs only during flu season. The order appears in the nurse's computerized medication administration work list to remind the nurse to administer the vaccine prior to discharge. The screening of the patient was moved from the discharge process to the admission assessment.

**Outcomes:** During Phase I, nurses had the ability to order the vaccines but rates of administration did not climb as expected. In Phase II, moving the screening to the beginning of the patient stay increased the probability that the nurse would have time to administer the vaccine prior to the patient leaving the hospital. Automating the order allows the hospital to compare orders to administrations and to track reasons why the vaccine was not given. Data are still being collected to assess the success of these initiatives.

### Lessons Learned:

Although physician buy-in was obtained at a Chief level, some physicians were and are still reluctant to give a vaccine to a recovering patient. This remains a barrier but not to the extent that it was.

Some technological hurdles still need to be overcome: Order does not drop from work list after administration. Reporting and Auditing is not as straightforward as hoped for and the hospital is working with IS and the vendor to improve the reports

### Future of the Initiative:

Vaccines for H1N1 have been added to the auto-ordering pathway and will continue to be added as part of the rapid response to new strains of influenza.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Monitoring the Anticoagulation Patient in Epic

Janis Bouchard BSN, RN Informatics Nurse Specialist

Elliot Health System

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The Elliot Health System consists of a 296 bed inpatient facility as well as several primary care and specialty practices (both Elliot and non Elliot owned) located throughout southern New Hampshire. We began implementing Epic in 1999.

In October of 2008 we implemented EpicCare in a five provider, non Elliot owned cardiology practice. The implementation was done in three phases, and took approximately three months. Once they were fully functional, we went live with Epic's anticoagulation monitoring module. Prior to this implementation, they managed their anticoagulation on paper. They have been live with Epic's anticoagulation module for two years now. They have enrolled over 300 patients. Epic's anticoagulation module is a special build that allows a provider to place an order to a specific site, which then enrolls the patient in that sites program. Once the patient is enrolled, the managing site documents all elements of the patient's anticoagulation therapy, in Epic. This information is then available to all users, within our facility, with appropriate security. Patients are managed with point of care (POC) testing and off site testing. For POC testing, the patient is seen in the office. The test is performed, and the results are entered into the system. This can be done via an interface or manually. Off site testing, such as that done by the VNA or by an outside lab, is resulted by using telephone encounters. The build requires the following components; Creating a specific order for enrollment. Creating a specific anticoagulation charting section to document both office visits and telephone monitoring. Creating an Episode that links all anticoagulation encounters for a site. Creating an anticoagulation flowsheet that pulls in specific results along with dosing, and follow-up instructions. Creating message types that notify anticoagulation clinicians of new orders and reminders that patients are due for rechecks. Creating reports that all users can easily use to see a review of patient's values and dose changes. Our goal was to provide an electronic way to monitor patients, on anticoagulation therapy, and to share that information with the entire organization. The result being improved patient safety and quality regardless of where the patient was seen in our system. This value of this monitoring system was evident from the start. Word spread and the IT department was asked to do the same for our three outpatient Medication Clinics. These clinics are outpatient, but the documentation and billing were inpatient. This required a slightly different build, but the same patient data was displayed. They went live on March 1, 2010. We are now able to give patients detailed instructions for taking their anticoagulation medication. We are also able to provide clinical users in the Elliot System detailed information regarding the patient's anticoagulation therapy.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Addressing the Demand for Education and Professional Development Health Informatics: Regis College Graduate Certificate in Health Informatics

Antoinette Hayes RN, PhD Dean, Penny Glynn RN, PhD  
Kathleen Donaher RN, PhD Associate Professor,  
Mark Sugrue RN

Regis College

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The American Recovery and Reinvestment Act of 2009, signed by President Obama on February 17, 2009, includes \$19.2 billion in provisions for healthcare information technology (health IT); authorizing the Centers for Medicare & Medicaid Services (CMS) to provide reimbursement incentives for providers who are successful in becoming meaningful users of an electronic health record (EHR).

The Office of the National Coordinator for Health Information Technology (ONC) is at the forefront of the Administrations Health IT efforts, and a resource to the entire health system to support the adoption of health information technology and the promotion of nationwide health information exchange to improve health care. (<http://healthit.hhs.gov>).

There is worldwide attention toward the importance of adopting effective health information systems within the fastest growing job market (Nemko, 2008; Bureau of labor <http://www.bls.gov/>). This poster describes how one college is addressing the demands of education and professional development of health informatics professionals.

The program fits with the institutions strategic goal of expanding experiential learning opportunities and with the faculty's stated commitment to a constructivist approach to learning.

**The Program:** Employs a case study method/problem based method in the classroom. Faculty work with students to design field experiences most appropriate to meet their professional goals. Three didactic courses and a field/mentorship experience.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## **Closing the Loop on Medication Safety at Massachusetts General Hospital**

Rosemary OMalley RN, MSN, MBA Project Manager  
Lynda Brandt RNC, MS, Patricia Crispi RN, MS  
Carol A. Ghiloni RN, MSN, Patricia Grella RN, MHA  
Judy Gullage RN, BSN, Kathleen Larrivee, RN, MSN  
Jennifer Mills Tamasi RN, MSN,  
Laura Sumner ANP-BC, MSN, M.Ed, MBA, ONC

Massachusetts General Hospital

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Providing safe, high-quality cost effective patient care is an essential component of the mission for a large 964 bed academic medical center. A new medication administration process was developed and implemented to support patient safety. To facilitate this process, Partners Information Systems developed an electronic medication administration application that closed the loop on medication safety by connecting the Provider Order Entry System, the Pharmacy information system and the Electronic Medication Administration Record. This major practice change optimized clinician workflow, provided decision support at the point of care, and enhanced patient safety. Multidisciplinary planning was crucial to prepare the organization and address the unique needs of individual patient care units. The educational plan encompassed a variety of learning methodologies

A key strategy required that each nurse and respiratory therapist attend a specially designed Medication Administration class that included medication administration simulation. Informational sessions were also presented to other health care providers. To support end user adoption, specially prepared Massachusetts General Hospital nurses were employed as coaches to provide 24/7 coverage. Nurses and respiratory therapists were coached in the application in the clinical inpatient setting for a period of two weeks. A rolling implementation was utilized on 40 inpatient care units with enhanced functionality to address unique needs, such as chemotherapy. The experience was enriching with many lessons learned. This journey provided direction for future technological enhancements and educational initiatives.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## Medical Errors Recovered by Critical Care Nurses

Patricia Dykes DNSc, MA, RN  
Jeffrey Rothschild MD, MPH, Ann Hurley DNSc, RN, FAAN

Brigham and Women's Hospital

New England  
Nursing Informatics  
Consortium

<http://www.nenic.org>

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**Objective:** The frequency and types of medical errors are well documented, but less is known about potential errors that were intercepted by nurses. We studied the type, frequency, and potential harm of recovered medical errors reported by critical care nurses (CCRN) during the previous year.

**Background:** Nurses are known to protect patients from harm. Several studies on medical errors found that there would have been more medical errors reaching the patient had not potential errors been caught earlier by nurses.

**Methods:** The Recovered Medical Error Inventory (RMEI), a 25-item empirically derived and internally consistent ( $\hat{\alpha} = .90$ ) list of medical errors, was posted on the Internet. Participants were recruited via email and healthcare-related listservs using a non-probability snowball sampling technique. Investigators e-mailed contacts working in hospitals or who managed healthcare related listservs and asked the contacts to pass the link on to others with contacts in acute care settings. Results During one year 345 CCRNs estimated to have recovered 18,578 medical errors, of which 4,183 were rated as potentially lethal.

**Conclusion:** Surveillance, clinical judgment, and interventions by CCRNs to identify, interrupt and correct medical errors protected seriously ill patients from harm.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## **Implementation of an electronic Medication Administration Record (eMAR) with Barcode Technology at the Bedside**

Sandy Abboud RN, MPH Clinical Informatics Manager

Newton Wellesley Hospital

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eMAP stands for electronic Medication Administration Process, a culmination of technologies used in medication administration. The components are an electronic Medication Administration Record (eMAR) and barcode technology (BMV) which is directly integrated with the Computerized Provider Order Entry (CPOE) and Pharmacy systems. The combination of these technologies provides an environment of increased safety to the patient as well as to the clinicians providing the patient care at the bedside. Newton Wellesley Hospital (NWH) is a 200 bed community hospital. The hospital provides inpatient Medical, Surgical, Obstetric, Pediatric, and Psychiatric services. NWH was committed to achieving the goal of increasing patient safety and reducing medication errors. Since 61% of serious medication errors occur after the ordering stage (IOM 1999), the timely implementation of eMAP maximizes the use of clinical information systems to standardize the encoding of data used to identify medications, patients, and clinicians (FDA ruling 2004) and to protect patients from preventable medication errors. In addition, electronic documentation allows readily available viewing access by all healthcare providers to the medication administration record. The project participants consisted of staff and managers from Information Services, Clinical Informatics, Nursing, Nursing Education, Pharmacy, Respiratory Care Services, and Physicians. It took 3 years to complete with staged implementation of new processes and software releases. Pharmacy had to ensure all medications dispensed contained a barcode on its packaging as well as being available in the Pharmacy system for the scanning portion for the nurse on the eMAR. Patient Access worked on the Patient ID bands which would contain the barcode to identify the patient. Once these were in place, the work of testing software, workflow processing, order entry redesign, training and support took place. The actual implementation of the eMAP to the inpatient units took 1 year which included a pilot of 3 months. The benefits of eMAP have been tremendous.

# Trends in Clinical Informatics: A Nursing Perspective – Poster Presentation



## **Electronic Bedside Communication Center (eBCC): Requirements to Support Patient-Centered Care**

Christine Caligtan RN, MSN Applications Specialist  
Ann Hurley RN, DNSc, FAAN Nurse Researcher  
Patricia C. Dykes DNSc, RN  
Diane L. Carroll RN, PhD, ACNS, BC, FAAN, Angela Benoit  
Ronna Gersh-Zaremski RN, MSN, CCRN

Partners HealthCare

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As patients shift towards using the web as a tool to gather information about their health and well being, patients are becoming proactive participants in their own healthcare. With the evolution of web-based communities such as social-networking sites, videosharing sites, wikis, and blogs, patients desire to have their own information available to them during their hospitalization. Patients lack real time access to health information and may not have the latest information on their plan of care. Moreover, nurses and other providers are often gatekeepers of information that exists in multiple places and is available in diverse formats. Published research indicates that communication failures due to inadequate information are common causes of medical errors. The purpose of this paper is to report on the requirements for a patient centered evidenced-based communication center prototype to ensure patients have access to the information they need to be proactive participants in their care.

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## **ANI Emerging Leaders Program Poster**

Ellen Makar, RN-BC, MSN

Yale–New Haven Health System, Conn.

In January of 2010, the Alliance for Nursing Informatics (ANI) selected two individuals to be paired with mentors in the field of nursing informatics. The selections were based on a number of criteria, including a mid-level position in informatics in a health care setting, a current license to practice as a registered nurse, and the ability to make a difference as a leader in the field of informatics. This inaugural program aims to develop leaders capable of assuming national leadership positions in an informatics-related organization.

The two emerging leaders are: Ellen Makar, RN-BC, MSN, of Yale–New Haven Health System, Conn.; and Sandra Ng, RN-BC, MSN, UCSF Medical Center, part of the University of California, San Francisco.

ANI and its Nursing Informatics Emerging Leaders Program are jointly supported by the American Medical Informatics Association (AMIA) and the Healthcare Information and Management Systems Society (HIMSS).

Ellen Makar currently serves as a clinical coordinator in the decision support department at Yale–New Haven Health, where she retrieves and analyzes administrative health data for projects that require operational, clinical, and financial decision-making.

Sandra Ng is currently responsible for operating trials of ground-breaking hardware and applications in a clinical setting, redesigning workflow processes, and evaluating impact of these innovations on various clinician workflows during routine patient care.

It is expected that this program will enable the nurses to grow their expertise in an area that supports optimum healthcare outcomes through improving systems that deliver quality health care.

ANI is co-sponsored by AMIA and HIMSS to represent nursing informatics with a unified voice, while providing synergy and structure needed to advance the efforts of nursing informatics professionals in improving delivery of patient care. ANI represents more than 5,000 nurses, brings together 26 distinct nursing informatics groups, integrates nurses from a broad swath of academia, practice, industry, and a variety of specialty areas, working collaboratively with nearly three million nurses who currently practice in the United States today.