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Use of Super Users to Support an Electronic Health Record

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Keywords: Clinical Documentation, EHR, Clinical Decision Support, Super Users

Introduction/Background
In 2008, Beth Israel Deaconess Medical Center (BIDMC) implemented a new electronic health record (EHR) for critical care. Nursing staff members were recruited and trained to act as Super Users to support the implementation. The nursing staff raised some concerns around redundancy, workflow issues, and how information around changes to the current EHR were going to be communicated.

Methods
We developed a proposal and were awarded funding to formalize an EHR Super User group to assist in improving our system.[1] In 2010, the EHR Super User group was established and consisted of an Informatics Nurse Specialist, Clinical Nurse Specialist, Critical Care Nurse Informatics Liaison and one Super User from each of the critical care units. Utilizing Lean methodology, we developed a mission statement with short and long term goals. The workgroup continues to meet for an eight hour day, six times a year to meet our objectives.

Results
Areas improved upon include: enhanced functionality of our flowsheets by reorganizing the layout; redesigned the nursing progress note; developed tutorials for newer staff members to critical care; implemented a popular frequently asked questions (FAQ) tab to support staff; provided downtime support to staff during implementation of database upgrade/service pack; redesigned our downtime forms; and all documentation guidelines were reviewed, simplified, and accepted by all committees.

Lessons Learned
We have learned many lessons on our quest to improve our EHR. Users need frequent re-education on the functionalities within the EHR. Constant reviewing and monitoring of the system is required as end users find workarounds in order to reduce their time documenting. We must minimize unnecessary documentation and reduce redundancy so that the end user has more time to spend at the bedside. Workflow must be considered when changes to the flowsheets are requested.[2] Finally, documentation should reflect standards of care as well as an accurate assessment of the patient's course.

Discussion/Conclusion
Our Super User group has made substantial improvements to our EHR. We will continue to standardize our EHR using a Lean methodology with an overarching goal to improve efficiency.[3] We are planning on exploring other ways to develop tutorials to further educate the end users of our system. We will continue to add to our FAQ tab to support staff in the use of our EHR.

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Digitizing Patient Education and Engagement: Implementing an Interactive Patient Care System in a Pediatric Teaching Hospital

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Keywords: Electronic Health Record, Medication Teaching, Patient Education, Patient Engagement

Introduction/Background

Traditionally, health care providers use written material as an integral part of their patient education practice; however, 9 out of 10 adults have difficulty using the everyday health information available in health care facilities and other institutions[1]. With increasing access to technology, new mechanisms to improve patients' understanding of health information and engagement in their care are emerging. These technologies not only benefit patients but also providers, as they streamline clinical workflows through integration with existing clinical tools. A vendor-based patient education and engagement tool is one such technological solution. It provides video-based health education, medication information, entertainment, and service assistance to patients and their families through the bedside television. In addition, it integrates with the electronic health record (EHR) and other systems, giving providers the ability to individualize and track their patient's educational journey. Boston Children's Hospital went live with this engagement tool in 284 inpatient bed spaces in August 2016.

Methods

This project had six key phases. During the *Plan/Initiate Phase*, a technical infrastructure assessment was conducted to plan for the installation of the hardware needed (e.g. flat screen televisions, wireless keyboards). During the *Design Phase*, key stakeholders outlined how to incorporate the system into patient education and medication teaching, patient onboarding and service response. The Family Advisory Council (FAC) developed an orientation video about the hospital and the engagement tool to air on the system for each new admission. Clinical subject matter experts vetted the licensed video health education content utilized in the system for accuracy. During the *Build Phase*, the system was integrated with the EHR and admit, discharge, and transfer (ADT) system. Custom education orders were built to give providers the ability to order video health education from the EHR and view when the family completed it. The system was also linked to the patient's medication list to allow families the ability to view their child's non-sensitive medications on the bedside television. During the *Train Phase*, more than 70 staff members received in-person and online training on the system. During the *Pre Go-Live Phase*, a plan to support any technical, education and hardware-related issues was developed. During the *Go-Live Phase*, a command center was opened to provide support for staff. Daily check-in calls were held and support staff rounded on floors.

Results

The patient education and engagement tool usability metrics are shared monthly with all units. Since the system's implementation, there were more than 11,000 unique visits. Of those unique visits, 94% of patients used the system for entertainment (e.g. watched a movie, played a game). 91% of patients viewed the FAC's orientation video and 22% viewed health education content. Prescribed health education is included in the 22% of health education viewed.

Discussion/Conclusion

Entertainment is the most utilized function of the IPC. Only a small number of patients are prescribed health education videos to view. Clinical staff attribute this to several factors. First, many feel that the video content is too basic for Boston Children's complex patient population. Second, some staff expressed challenges in adapting their established teaching workflows. Boston Children's is exploring the creation and purchase of new video content as well as the development of video order sets.

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Strategic Design for a Pediatric Value-Based Model of Care in a Population Health IT Solution

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Keywords: Population Health, Care Management, Clinician Engagement, Pediatrics, IT Workflow Alignment

Introduction/Background
The healthcare market is redefining how we think about care delivery by empowering health systems to focus on population health management and value-based care. Value-based care focuses on high quality, patient centered care while the health system is also held accountable for the cost of those services. There is need to engage clinicians to collaborate in the design and implementation of a solution that facilitates the shift in care[1]. Broadening the way clinicians think about their patients' overall health requires an Enterprise-wide strategy and accompanying IT platform to support a value-based care model. The goals included 1) launch a platform designed to integrate with current provider workflows for documentation; 2) design tools to improve care for asthma and childhood wellness populations; and 3) incorporate a longitudinal record for better coordination of care.

Methods
A multidisciplinary informatics and operational leadership team evaluated current business and IT solutions for opportunities to improve workflows and efficiencies. The team outlined the functional and reporting requirements for accountable care contracts, and collaborated with a vendor to align to a standard Population Health Management platform. Design elements were vetted with various clinical teams, engaging individuals to focus on a future model of value-based care. The feedback and engagement from interprofessional teams helped iteratively refine the platform design and roadmap for upcoming go-live.

Results
The platform is scheduled to launch June 2017 in alignment with current and newly designed clinical workflows to support asthma and childhood wellness. The design integrated national quality metrics and localized best practices, with proactive approach to care. The longitudinal record incorporates claims data along with native EHR clinical data to display a robust patient picture. This new functionality will allow care team members and population managers to better manage patient care.

Discussion/Conclusion
Discovering the knowledge gap across the institution was key to engaging stakeholders and creating the value proposition for shifting to more streamlined population health management. Communication between the multidisciplinary leadership team and the enterprise facilitated common understanding of needs and strategy, despite often conflicting expectations of the solution. Forty-Five percent of vendor standard metrics spanning 3 patient registries required client customization which increased design and build timeframes. Success required empowerment and alignment of multidisciplinary teams, equipped with forward thinkers who could design beyond current knowledge and experience.

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Aligning Changes in Regulatory Requirements for Restraints with Documentation

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Introduction/Background

Integration of changes in regulatory language[1] into a complex electronic documentation system that is customized to optimize workflows throughout diverse clinical settings presents many challenges. The process requires collaboration among many teams including Clinical Informatics, Quality and Professional Practice, Clinical Education and Information Services. Careful coordination among these groups is required to ensure that changes to policy, practice and documentation occur simultaneously. We will describe the response to recent changes in regulatory language about restraints. This change in regulatory language was enacted to increase clarity around the reason for restraint. Previous language was ambiguous and caused confusion in both ordering and documentation.[1]

Methods

Responding to this change required collaboration among the Restraint Subject Matter Expert (SME) group, policy and procedure leadership, and the clinical informatics specialist. This collaboration facilitated the orchestrated transition of restraint terminology changes. The SME group met regularly, to ensure that all aspects of the changes were ready and coordinated to ensure an on-target go-live. The policy stakeholders validated the naming convention changes, which were approved by senior nursing and medical leadership. The clinical informatics specialist shared mock ups of EHR changes for validation. The SME group, which included nursing end users, worked with the clinical informatics team to understand the go-live turnover impact on active restraint documentation. The SME leadership also worked in collaboration with end user educators to create a communication leveraging the standard SBAR (Situation, Background, Assessment and Recommendation) format, online learning management system modules for prescribers, and just in time intranet announcements. Upon go-live, the policy was published and accessible to end uses, and the EHR change conversion occurred. The SME leadership distributed a report listing admitted patients with active restraint orders to the informatics specialist so that end users could be contacted directly to support the transition of documentation for these patients. This report was repeated the day after go-live to ensure all active orders in the EHR were consistent with the new naming convention and policy.

Results

Based on daily reports reflecting restraint ordering, there has not been evidence of either an increase or decrease in restraint ordering accuracy. A subject matter expert who represents the nursing staff on the units states, "Renaming the behavioral and medically necessary restraints has been seamless due to the education to all prescribers and nursing staff."

Discussion/Conclusion

We believe that this successful effort was based on managing the SME group's expectations and setting realistic timelines to align with requirements/requests to balance with the technical build demands. It is also essential to engage subject matter experts to design and validate changes. A constant consideration that is essential for the alignment of regulatory practice and changes is to ensure collaborative expertise to align the implementation of changes throughout the system[2].

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Comparing Stages of Automation of Fall Prevention Protocols

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Keywords: Patient Engagement, Patient Education, Clinical Decision Support

Introduction/Background
The development of Fall T.I.P.S. (Tailoring Interventions for Patient Safety) reduced falls by 25% in an acute care hospital by leveraging health information technology to 1) conduct fall risk assessments, 2) develop tailored fall prevention plans with the evidence-based interventions and 3) consistently implement the plan along with universal fall precautions[1]. We developed a laminated paper Fall TIPS tool that provides clinical decision support linking patient-specific risk factors to the evidence-based interventions and decreased mean fall rates and mean fall with injury rates[2]. Fall TIPS has since been integrated into the EHR.The purpose of this study is to examine differences in patient engagement (as defined by patient knowledge of personalized fall risk factors and prevention plan) and model efficacy as related to the different stages of Fall TIPS automation. Our previous work suggests that patient and family engagement is associated with improved efficacy.

Methods
At three academic medical centers the Fall TIPS documentation is first completed in the EHR. There are four protocols to complete the three-step fall prevention process: 1) the prevention plan is manually documented at the bedside with the patient on laminated Fall TIPS posters and hung, 2) a bedside poster is automatically generated with tailored fall prevention icons, used as an education tool, then hung, 3) protocol number two, plus the personalized fall prevention plan automatically displays on bedside monitors as a patient safety screensaver and, 4) the personalized fall prevention plan automatically displays as patient safety screensavers based on the documentation in the EHR and no paper sign is used or displayed. To assess efficacy of the different stages of automation with respect to patient/family member engagement, random audits were conducted using the following questions: 1) "Did the nurse speak with you about the plan to prevent you from falling in the hospital?" and 2) "Is the patient or family member able to speak to what the fall prevention plan involves?" The main outcome measured is the percentage of patients and family members who reported engagement in the three-step fall prevention process across the four levels of automation.

Results
Data collection is ongoing; to date 316 patients and family members have been interviewed.

Table 1: Percentage of reported engagement by question

Protocol	Question 1	Question 2
1	67%	55%
2	90%	84%
3	70%	45%
4	75%	75%

Discussion/Conclusion
Due to the asynchronous implementation of Fall TIPS at each institution, the units are both at different stages of automation and different stages of improvement in adherence to the protocol. Data is limited on units that have exercised shared governance structures and chosen to use different stages of automation. Barriers to implementation are being addressed, which include lack of awareness of the practice change, lack of familiarity with the protocol, lack of agreement with the protocol and inertia of previous practice. We will continue to audit the levels of patient engagement and compliance with the protocol, sharing data with unit leadership to facilitate improvement in patient engagement.

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Finding the Fitness Fit: Perceptions of Older Adults Participating in Community-Based Exercise Programs

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Key words: community-based exercise programs, older adults, fall prevention, barriers, facilitators

Introduction/ Background
As the American patient population ages, falls and fall related injury prevention are essential to lowering healthcare costs, maintaining patient independence, and decreasing hospitalizations[1]. Lack of physical activity has been identified as a risk factor for falling. Fewer than 25% of adults between the ages of 65 and 74 meet the CDC guidelines for physical activity[2]. Nearly half of falls can be prevented by well-designed exercise programs that challenge balance and are performed consistently for 2 hours a week over a 6-month period[3]. Formalized physical activity such as a community-based exercise program is vital to reducing the degenerative effects of aging by strengthening muscle and improving balance. This study aims to identify the goals, benefits, facilitators and barriers of 40 surveyed adults 70 and older who have actively participated in a community-based exercise program in the Greater Boston Area in an effort to promote patient-centered programs that cater to the preferences of the older adult population.

Methods
The study used a convenience sample of 40 participants from a national falls prevention study, who were referred to a community-based exercise program by a nurse specializing in falls prevention.
An 18 question REDCAP survey tool was created using criteria from the Sherrington meta-analysis and CDC guidelines for older adult exercise. Descriptive statistics were used to quantify the dichotomous survey results and responses to the open-ended feedback questions were coded using thematic analysis.

Results
Individual factors, class characteristics and gender preferences influenced older adult participation in community-based exercise. Key barriers such as disability status and gender imbalances were individual factors that deterred patients. The class instructor and social cohesion facilitated adherence to the program.

Discussion/ Conclusions
Identifying participant goals and barriers may allow for community-based exercise programs to tailor curriculums to patient preference. While the CDC guidelines provide a useful starting framework for older adult recommendation guidelines, providers and organizers of geriatric physical activity must tailor their referrals to a patient's gender and motivational characteristics.

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Design of a Colorblind-Friendly Patient Safety Dashboard

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Keywords: Clinical Documentation, Clinical Decision Support, Patient Safety and Quality

Introduction/Background

Adverse medical events are an ongoing public health concern, with recent studies listing preventable harms as the cause of death for approximately 200,000-400,000 patients in the U.S. yearly[1]. As part of the Patient Safety Learning Lab study (PSLL), our research team created an interactive safety dashboard that is integrated into the electronic health record (EHR). This dashboard compiles data on various safety categories in real-time, and draws from clinical documentation completed by doctors, nurses, and other members of the clinical team[2]. The current version of the dashboard utilizes a color-coded system of red, yellow, green and gray to differentiate between four levels of alerts. Given this color scheme, red-green colorblind users will struggle to use the information as presented.

Methods

To address this issue, small yet substantial revisions in design were devised to assist users in better distinguishing between flags. This was in response to feedback that was suggested during the pilot phase of the study, stating that colorblind users would currently find this tool ineffective. The approved colorblind-friendly mockup (**Figure 1**) is based on the iterative refinement of earlier rough drafts, which were all formed from the initial input of the PSLL research team members. This specific mockup was chosen because it presented the lowest level of cognitive burden to users; it also allowed for the simultaneous enhancement of an existing functionality with red and yellow flags, where users can check the flag to indicate that they are aware of an increased patient safety risk.

Results

The current version of the dashboard and the colorblind-friendly mockup are shown below. All mockups were analyzed through software that simulates colorblind vision, and were first vetted by a colorblind Brigham and Women's provider as well as a human factors expert before being presented to the larger research team.

Figure 1: Current unit-level view of the patient safety dashboard (left) and colorblind-friendly mockup (right).

Discussion/Conclusion

Aligning with the user-centered design that inspired the creation of the dashboard, it is imperative that all dashboard users are properly accommodated. These revisions allow colorblind users to easily distinguish between different flag types, while preventing an increased cognitive burden by maintaining the overall color scheme. Though a seemingly small change, this new design is expected to increase accessibility of the dashboard by incorporating a larger pool of users and facilitate its spread to other hospital institutions.

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Integrating the Patient Satisf*Active*® Model into a Patient Safety Dashboard: Development and Initial Experiences

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Keywords: Patient Experience, Patient Expectations, Clinical Documentation, Quality Improvement

Introduction/Background:
Over the past decade, patient-centered care (PCC) and patient experience have drawn increasing interest, highlighting the importance of incorporating patients' needs and perspectives into care delivery[1]. Yet, despite expanding initiatives, many healthcare organizations have faced barriers when attempting to transform their organizational culture from 'provider focused' to 'patient focused'[2]. The Patient Satisf*Active* Model[3], a structured pro-active communication tool, was developed to meet the need for creating a culture of PCC. In the model, clinicians identify and respond to patient and family needs, concerns, and expectations, thereby improving patient experience and satisfaction in real-time. The model has previously found success in three inpatient clinical trials. In this study, we describe the process of integrating the model into an electronic patient safety dashboard and our initial experiences.

Methods:
In order to integrate the model into clinician's electronic workflow, we engaged with stakeholders in: 1) identifying system requirements (e.g. limiting additional documentation, achieving interdisciplinary visibility); 2) developing logic to reflect the model's structure of asking, responding, engaging, and documenting patient and family expectations within the safety dashboard. We are analyzing the system to identify barriers and usability issues across twelve inpatient units and three clinical services at the Brigham and Women's hospital.

Results:
The model was integrated into an electronic patient safety dashboard. The dashboard aggregates information from the electronic health record (EHR) into thirteen safety domains (e.g. code status, delirium), and codes patient riskiness as red/yellow/green/grey. A new domain ("patient expectations") was created. When new data is entered into the EHR, a yellow alert is displayed on the dashboard. Upon completing the task, clinicians can "check" the dashboard item and the alert turns green. One month of experience shows that while data regarding psychosocial issues is entered on the majority of patients, clinicians only use descriptive free text comments on 20% of patients versus precoded data fields (e.g. "physical"; "emotional"), limiting the utility of the displayed information.

Discussion/Conclusion:
Initial feedback and experience has been positive. Clinicians like that patient expectations is structured to have as much weight and importance as other clinical metrics. Barriers to use include the fact that currently clinicians are using the precoded text fields rather than descriptive free text comments, limiting the usability of the information on the dashboard. More analysis is needed in order to see how clinicians continue to interact with the dashboard and engage with the Patient Satisf*Active* Model.

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Creating an Audit Report Utilizing Structured Text Fields to Monitor Procedural Sedation Documentation

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Keywords: - Knowledge representation, Patient Safety and Quality, EHR Audit Report

Introduction/Background

Procedural Sedation is typically performed by credentialed non-anesthetists in procedural areas and other units at Brigham and Women's Hospital. Prior to implementation of the vendor-based Electronic Health Record (EHR), documentation surveillance of these procedures was performed manually using a chart audit tool. These audits provided a random snapshot that guided attention to areas needing reminders regarding compliance with the policies and regulatory aspects of procedural sedation. The documentation requirements are addressed in The Joint Commission standards and further defined by the American Sedation Association (1). The chart audit tool utilized prior to vendor-based EHR yielded an annual average of approximately 340 audits out of an estimated 20,000 cases per year with variable completion rates per area. The compliance data was specific only to the area's level of compliance. Moving to an EHR allowed us the opportunity to improve this quality and efficiency of this process.

Methods:

In the vendor-based EHR all procedural sedation is documented in an electronic form developed specifically for these procedures. The build components of this documentation were standardized with structured text and specific fields for key data elements. The Nursing Quality and Informatics departments worked together to identify the data element required to build a report in order to extract a data set representative of the regulatory requirements. Those specifications were submitted to the reporting team and used to build the report. The report used complex logic to identify cases. First was the presence of an event documented using the electronic form, second the administration of fentanyl or midazolam and finally a maximum level of a sedation score equal to or greater than two. Cases were excluded if they were performed by an anesthetist. The report detailed specific pre, intra and post procedure metrics required by hospital policy and regulatory standards (2).

Results:

We built a report that served as an audit tool for 100% of the cases. The report was shared with the Sedation Management Advisory and Resource Team. The report can be drilled down to patient and user level specifics and revealed discrepancies in documentation practices. Required build changes were identified to assure that data fields were consistent and available to users in their workflows. The transition from sampling manual audits to 100% electronic audits required an understanding of the report algorithm as the electronic data revealed opportunities for improvement in use of the EHR and changes in workflow. In addition to the metrics for the report, staff names are available so any chart deficiencies which are identified can be addressed with the user.

Discussion/Conclusion

Having Nursing Informatics and Nursing Quality professionals members of the content decision making team resulted in the standardization of an EHR build that supported the clinician's workflow as well as the eventual report output. Our transition from limited manual to 100% electronic audits has revealed documentation education/training opportunities. Utilizing a report that samples time stamped, filed data in the record requires real time documentation. Previous manual audits lacked that specificity. The long term benefits of this report are numerous for compliance with policy and regulatory demands and to assure that patients receive the appropriate standard of care.

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Clinical Decision Support to Achieve Compliance with Tobacco Screening

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Keywords: Clinical Documentation, Clinical Decision Support, Patient Safety and Quality, Tobacco Screening

Introduction/Background
The Massachusetts state Medicaid program requires quality metrics on screening patients for tobacco use as part of the admission to an acute care hospital. This measure, known as Tobacco 1, specifically looks to capture the adult patient's use of any tobacco product within the 30 days prior to admission to the hospital. Clinical decision support (CDS) in electronic health records (EHRs) has been used with success for tobacco cessation assessments and interventions.[1] CDS has been shown to be effective in impacting clinical care and can include alerts, reminders, order sets, drug-dose calculations, and a variety of other clinical tools that help with clinical documentation and decision making. Brigham and Women's Hospital (BWH) moved to an enterprise wide EHR in May of 2015. Prior to that time, nurses were assessing patient's tobacco use and documenting on a paper admission form with a compliance rate of 78%. After conversion to the electronic health record, documentation rates fell as low as 21%. At that time, it was determined that an electronic solution was needed to ensure nurses were screening and documenting tobacco use on all patients at every admission.

Methods
As BWH is part of the Partners Healthcare System (PHS) and all entities use the same EHR, an enterprise solution was required. Working with Partners eCare and the other Partners inpatient sites, it was decided to add the "tobacco use" data field to the EHR as an element that required admission documentation. CDS rules were written, validated and taken through the PHS CDS governance and build process. Once built and put into the production environment, nurses would be reminded with a CDS alert to complete the regulatory-required assessment documentation. Prior to implementation, a full scale education program was initiated to ensure that nurses understood the alert that they would be receiving, the reason that it existed, and their documentation responsibilities once it alerted them to the missing Tobacco 1 documentation.

Results
In November 2015, tobacco assessment fields became required documentation for nurses as part of the admission assessment. The following quarter our compliance rate jumped to 92% and has leveled out to a consistent 97% for the past two quarters.

Discussion/Conclusion
The use of a clinical decision support reminder in this situation achieved results that are consistent with what can be found in the literature. The CDS alert reminds nurses that specific documentation elements associated with a patient's tobacco use have not been completed. Documentation compliance rates have been sustained for at least two quarters since implementation. As a result of improving documentation "compliance" we have improved the quality of our tobacco use screening and health maintenance nursing interventions for our patients. While we did not measure patient outcomes, we anticipate that the interventions aimed at elimination of tobacco use for some of our patients might lead to better health outcomes over the long term. .

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Barriers to Use of Health Information Technology Tools in the Neuroscience Patient Population

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Keywords: Patient safety, Patient engagement, Electronic Health Record, Barriers to use

Introduction/Background

The Patient Safety Learning Lab, an AHRQ-funded study, aims to promote patient-centered care, improve patient safety and reduce adverse events. The intervention includes a suite of health information technology tools, one of which is the personalized patient safety screensaver. The screensaver displays disparate data documented in the EHR on the monitor at the patient's bedside. The content has been identified as the core set of information to keep the patient safe at the point of care[1]. Examples include right/left hemiparesis, assistive devices needed for the patient to ambulate safely, and sensory deficits such as a field cut. The screensaver is meant for all members of the care team, including patients and families, and has been rolled out on General Medicine, Oncology and Neuroscience units. The purpose of this study is to identify the unique barriers to use of the screensaver for patients on the Neuroscience units.

Methods

Qualitative data was obtained through informal interviews with nurses, patients and families (see Table 1). Twenty-two interviews were conducted to identify if the patient/family was able to engage in use of the tool. This was a random sample of the population on the floor. All patients on the floor had access to the tool while this survey was underway. Specific barriers to use were then identified through informal interviews with nurses.

Table 1: Informal interview guide

Question 1	Question 2	Question 3
Is patient/family able to use the screensaver?	Does the patient/family use the screensaver?	If unable, what are the barriers to use?

Table 2: Common barriers to use of patient safety screensaver

Barriers to patient use of screensaver	Barriers to family use of screensaver
Cognitive (n= 5)	Absent* (n= 9)
Behavioral (n = 3)	Language (n = 3)
Language (n = 1)	

*Absent: Family members were not present at bedside when interviews were conducted

Results

Of the 22 groups interviewed, 9 patients and 12 family members were identified as being unable to participate in using the screen saver safety tool. The most common barriers to use are detailed in Table 2.

Discussion/Conclusion

Among the population of patients on an inpatient Neuroscience, barriers to use of the patient safety screensaver can be categorized into three main groups for patients, and two main groups for families. Identifying barriers to use will aid in improving the use of health information technology tools within this unique population in the future.

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Nurse Driven Protocol for Influenza Immunizations for Inpatients

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Keywords: Patient Safety and Quality, Clinical Decision Support, Nurse Driven Protocol, Influenza Immunization

Introduction/Background

Influenza vaccines have been shown to be safe and effective in preventing Influenza. This disease can lead to substantial morbidity and mortality, especially in the elderly. The Center for Medicare and Medicaid Services (CMS) requires that all hospitalized patients be screened for eligibility of the influenza immunization and vaccinated if no contraindications exist. Inpatient influenza immunization screening and documentation compliance rates declined significantly after Brigham and Women's Hospital (BWH) transitioned to a new Electronic Health Record (EHR) in May 2015. This required us to design a new influenza immunization workflow to improve patient care and compliance. A BWH interdisciplinary team opted to implement a nurse-driven protocol for the ordering and administration of the influenza immunization.

Methods

A BWH team including physicians, pharmacists, clinical and informatics nurses and quality leaders convened a task force to implement the new workflow. Interventions included:

- Collaborated with informatics colleagues across the health system to build functionality in the EHR that would facilitate and support the nurse-driven protocol
- Reviewed a new nursing workflow with all clinicians to identify potential facilitators and barriers to the ordering and administration of the influenza immunization by nursing
- Created the BWH Department of Nursing & Medical Staff Executive Committee approved *Nurse Driven Protocol for Influenza Immunizations for BWH Inpatients* to support the new workflow
- Updated the online drug information references for clinicians
- Created an additional workflow with pharmacists to order the influenza immunizations for special patient populations (egg & latex allergies and hematologic conditions)
- Utilized BWH EHR super users and department experts to educate front line staff on the nurse-driven protocol
- Collaborated with informatics colleagues to optimize the Influenza Immunization Core Measure (IMM-2) electronic report for real time monthly data review and identification of opportunities for continued improvement

Results

Centers for Medicare and Medicaid Services (CMS) and The Joint Commission (TJC) Influenza Immunization Core Measure (IMM-2) for the first quarter of the 2016 influenza season (October-December 2016) exceeded our 90% target, with a performance rate of 99% for screening and documentation of influenza immunization.

Table 1: BWH CMS/TJC IMM-2 Performance

Time Period	# of Patient Cases Compliant	Total Patient Cases Included	Observed Rate (%)
October-December 2015	207	249	83
October-December 2016	238	240	99

Discussion/Conclusion

Transitioning to a nurse driven protocol for the ordering and administration of the influenza vaccine proved to be successful. Critical elements to the success of this project included multidisciplinary collaboration to implement the new workflows as well as a streamlined build in the EHR that supports an efficient nursing workflow.

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Using Barcode Technology to Decrease Specimen Mislabeling Errors

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Keywords: Clinical Documentation, Process Change, Patient Safety, Quality, Specimen Labeling, Barcode Technology

Introduction/Background

Mislabeled specimen errors can lead to serious problems since many health care decisions are based on laboratory results. In May 2015 Brigham and Women's Hospital (BWH) implemented a vendor-based standalone specimen collection product, interfaced to the Electronic Health Record (EHR), to positively identify the right patient to the right specimen order. This product used bar code technology as an intervention to reduce specimen labeling errors. The new process would insure compliance with The Joint Commission's Patient Safety goals: *(Joint Commission, National Patient Safety Goals, 2015).*

Methods

Collaboration between Nursing Informatics and laboratory and IT colleagues was initiated to develop a positive patient identification laboratory specimen collection workflow. The stand-alone vendor product and the existing EHR were leveraged to accomplish this task. Functional and workflow requirements were identified. Patient- and specimen-specific labels generated from the system were configured to allow nurses to use barcode technology to positively identify the patient and the correct ordered specimen at the point of care. An electronic usage report was developed and distributed four to five times per week to the nurse educators for follow up on a unit level. The report is a tool which supplies details about all specimens collected and facilitates identification of when the system was not successfully used. Nurses were engaged at all levels of the organization to identify obstacles and report problems with the newly implemented process of using positive patient and specimen identification.

Results

Baseline mislabeling rate data was collected monthly from August to October 2014 and showed an error rate from 0.23 to 0.32 (avg 0.27): (Melanson, et al., 2016). Post implementation mislabeling rate data was collected from August to October 2015 and demonstrated an error rate of 0.17 to 0.08 (avg 0.10) which was a 63% reduction. The total number of known mislabeled specimens was also reduced from 72 in 2014 to 23 in the same three month span in 2015. This represented a 68% decrease in total labeling errors.

It was also notable that 21 out of the 23 errors identified in 2015 occurred when the stand-alone product was not used successfully. Frequent distribution of the usage report and the subsequent attention paid to the product functionality contributed to an improved "successful usage" rate. At the time of the 2015 data collection the success rate in using the stand-alone process was approximately 75%. Within 5 months of distribution of the usage report the "successful usage" rate of the stand-alone product increased to 90%. With the increase in the successful use of the stand-alone specimen collection product the mislabeling error rate significantly decreased to an average of 0.02 for a three month period.

Conclusions and Recommendations

Collaboration between nursing informatics professionals and bedside clinical nurses, along with colleagues from the laboratory and IS resulted in the reduction of a significant safety issue for our patients. Leveraging our EHR along with an interfaced standalone product, we were able to implement the use of bar code technology to effectively reduce specimen mislabeling errors.

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Leveraging Electronic Health Records to Support Innovative Research

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Keywords: Clinical Documentation, Electronic Medical Record, Patient Safety and Quality

Introduction/Background

Prior to electronic health records (EHR), the conduct of research involved the painstaking creation of databases and data collection instruments. The conduct of research has been revolutionized by the use of EHR, which enhance the overall efficiency of the research process (Rusanov, A., Weiskopf, N., Wang, S., & Weng, C., 2014). We recently conducted a randomized control trial testing a new needle free blood draw device. The purpose of this abstract is to describe how an EHR supported the conduct of this research, allowing the study coordinator to manage the study using data from the EHR.

Methods

We used an EHR in a prospective, randomized controlled trial involving 160 surgical patients in order to test a new needleless blood draw device postoperatively. In order to screen for potential subjects for this study, the study coordinator utilized the hospital's EHR to run reports of preoperative evaluation appointments and operating room schedules. The study coordinator then created a spreadsheet, listing the patients identified through the EHR as meeting the study requirements. After consenting and being enrolled, patients were flagged in the EHR as research subjects. Progress notes were added to their EHR identifying them as members of the study. The study coordinator placed the orders for the blood work in the patient's EHR and when the blood draws were performed, the lab results populated in the patient's EHR. The study coordinator also used the patient's EHR to record the dwell time of peripheral intravenous catheters. Finally, the EHR was utilized to review study related charges.

Results

Many features of the EHR were used in the conduct of this research. Data from the EHR helped the study coordinator screen, enroll, and flag potential subjects, monitor operating room schedules and changes, track subjects' location within the hospital, order and view lab results, communicate with the subjects' clinical teams, document and retain data to fulfill the IRB and other federal regulatory requirements, perform retrospective analyses, and review study charges.

Discussion/Conclusion

As healthcare evolves, nurses will continue to evaluate new technologies that may improve patient care. Nurse researchers studying these new technologies should recognize that EHRs have the potential to greatly improve research study workflows, but should also be cognizant of potential limitations. One limitation experienced during this study was the inability to hide lab results intended strictly for research purposes from the clinical team. Another potential limitation to generalizabilty is that the research features we used had been built into the application for research support. These research functions were included in the EHR, and therefore, were readily available after training on the use of these features was complete. The utilization of EHR in research offers the opportunity to speed the rate of nursing and healthcare discoveries, ultimately improving nursing practice and producing better patient outcomes (Friedman, C., Wong, A., & Blumenthal, D., 2010). Given the prevalence of EHRs in today's healthcare world, further research and the establishment of set guidelines for using EHRs for research purposes would be beneficial to all researchers in healthcare.

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Adoption and Spread of an Electronic Patient Safety Checklist to Eliminate Adverse Events in Intensive Care Units

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Key words: patient safety, intensive care units, checklist tool, adoption

Introduction/ Background

Effective care of critically ill patients requires collaborative decision-making, goal-related follow-up actions, and patient safety double checks. Studies have shown that standardized checklists help coordinate evidence-based care practices.[1] The use of checklists within interdisciplinary rounds in the ICU can reduce patient harm by improving communication and documentation.[1,2] Our team developed an electronic ICU Safety Checklist Tool (eISCT) for use in the Brigham and Women's Hospital Medical ICU (MICU) on multidisciplinary rounds. The eISCT incorporates existing validated safety checklists into a single integrated checklist and displays the real-time status of safety items on a unit dashboard. An initial evaluation of the eISCT over a 10-month period on 1134 patients demonstrated consistent checklist completion and a 30% reduction in adverse events (p=.009).The purpose of this study is to refine the BWH eISCT for use in two additional BWH/Faulkner Hospital ICUs and develop the tools needed by leadership, clinician, and information technology stakeholders to facilitate generalizability and spread of the eISCT.

Methods

We worked with BWH/FH clinicians to observe rounding workflows and identify barriers to use of the eISCT in their ICUs. During monthly meetings we discussed with stakeholders how to integrate the eISCT into current workflow. We worked with nursing practice committees to identify the types of tools needed to implement the use of the eISCT. We received input from clinicians on ways to refine the eISCT logic and content to improve usability.

Results

Based on stakeholder feedback, we developed refined versions of the eISCT. Clinicians wanted messages on the eISCT dashboard to alert the team of the action needed to resolve the status of a safety item, so we refined the dashboard to clearly convey actionable items. We decided on times in clinician workflow to implement the eISCT in the BWH/FH ICUs. We created a toolkit to help educate the ICU clinicians on use of the eISCT. The toolkit included a pocket guide that highlights when and how to use the eISCT, as well as a manual that describes each eISCT item in detail.

Discussion/Conclusion

The eISCT has the potential to enhance team communication and reduce preventable harms in ICUs outside of the BWH MICU. However, different ICU settings have distinct workflows and patient populations, so communication with clinicians, leadership, and information technology stakeholders is essential to the adoption and spread of a safety checklist tool.

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Technology Enabled Quality Improvement (TEQI): An Innovative Approach to Inpatient Flu Vaccination

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Keywords: Influenza Vaccination, Core Measure, Technology Enabled Quality Improvement (TEQI)

Introduction/Background

Widespread flu outbreaks can be prevented through the effective use of vaccination programs.[1] Healthcare organizations are obligated to both educate and protect patients from this potentially deadly disease. For this reason, The Centers for Medicare & Medicaid Services and the Joint Commission developed the IMM-2 Influenza Immunization core measure. In 2016, the Chief Nursing Officer at Lahey Hospital and Medical Center (LHMC) challenged a group of nurses to design to improve the inpatient flu vaccination rate as many of LHMC's 22,000 annual inpatients are some of the most vulnerable to flu. LHMC's 2015-2016 IMM-2 Influenza Immunization core measure rate was 69% and a goal of 98% or better was set for the 2016-2017 performance period.

Methods

LHMC's Department of Nursing developed the TEQI methodology to rapidly improve nursing practice and patient care by leveraging technology solutions. TEQI provides a consistent approach to quality improvement and incorporates best practices from within and outside the discipline of nursing. The major elements of TEQI are defined as Research, Innovation Cycle, Pilot, Deploy and Evaluate/Contribute. The TEQI Methodology incorporates an approach to team identification called R.I.P.E, which stands for the key stakeholders of Research, Informatics, Patient/Practice and Education. This simple methodology reminds all team members of essential stakeholders throughout the TEQI phases. The team leveraged an Advisory Board report "The Manager's Guide to Engaging Staff"[2] which suggested that making a game out of an initiative would lead to greater staff engagement. "A Bug's Life:" game was created to be a competitive event between inpatient units that would provide feedback and recognition for success and create excitement around patient vaccination. With collaboration of IS, nursing informatics, staff and leaderships various versions of vaccination process status reports and indicators were developed. Pilot results culminated in a simple aggregated single data point that was displayed on the patient list screen that easily identified a patient's vaccination status. A weekly "Bug Report" showing weekly vaccination rates was shared with all inpatient areas and units with highest compliance rates received recognition and reward.

Results

Improvements were noted almost immediately. Within a week of deployment several units achieved 95% compliance with inpatient vaccination. The 2016-2017 flu season is still in progress, but the preliminary data at the time of abstract submission is trending in the 98% range for IMM-2 Core Measure compliance. This far surpasses previous seasons' annual compliance rate.

Discussion/Conclusion

TEQI leverages technology and human capital to impact the quality and financial health of an organization and is a smart investment of time and resources. Allowing the professionals at the bedside, who are doing the work to use an innovative and technology-enabled approach for solving problems is essential. This process was successful and can be easily scaled and repeated for future quality and safety solutions. In fact, LHMC Nursing is already applying this methodology to other key initiatives including falls, smoking cessation and the discharge medication process. LHMC looks forward to sharing this future research as we continue to validate and improve the TEQI methodology.

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Improving Inpatient Nurse Manager Quality & Safety Dashboard and Associated Reports

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Introduction/Background
An Inpatient Nurse Manager Quality and Safety dashboard, with associated reports, was developed by the Partners eCare team as a tool within our EHR to provide nurse leaders a "real-time" view of their unit. However, this dashboard and its reports were underutilized by nurse leaders due to inconsistencies in data presentation and metrics. Our team initiated a process to improve this tool and develop an operational plan for its use. Our objectives included: 1) developing a consistent look and feel for the dashboard and associated reports so that problem and/or actionable areas are easily identified; 2) validating that data displayed in reports is meaningful to the metrics examined; and 3) operationalizing effective use of the dashboard to monitor quality compliance, identify areas for nurse education, and follow documentation associated with nurse sensitive indicators.

Methods
Our proposal of an Enterprise workgroup focused on improving this dashboard was brought to Partners Nursing Informatics Advisory Council and was prioritized for eCare. We created a workgroup from Massachusetts General Hospital (MGH) composed of nurse leaders representing direct care areas and the Quality & Safety department, to inform the Enterprise group and vet decisions. Workgroups met twice monthly to systematically review each section of the dashboard to ensure that report data reflects the objectives, and that metrics displayed are relevant to nurse actions. We used these recommendations to facilitate discussions with the Enterprise group.

Results
The first report we reviewed was the Pressure Ulcer report. Improvements included renaming columns with clinically relevant titles; adding columns to indicate measurements and wound consult status; and highlighting low Braden scores. This report is being used operationally to increase nurse compliance with measuring pressure ulcers every 7 days and to facilitate the removal of wounds that are no longer "active" from the EHR.

Dashboard improvements are released incrementally; training of nurse leaders in use of this tool is ongoing. Initial feedback from nurse leaders is positive. Participants are actively engaged in this process and are developing skills in report and dashboard design. A reference guide of column and metric definitions is being created during this review.

Discussion/Conclusion
Nurse leaders have an increased understanding of how dashboards can support and promote practice improvements and quality of patient care. In addition, by taking this granular journey through the EHR, nurse leaders gain a better understanding of required flow sheet documentation. Relationships among nurse leaders across the Enterprise are enhanced and a shared approach to meeting regulatory requirements is strengthened. A process has been established to incorporate MGH nurse input into eCare design.

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Challenges and Lessons Learned in the Transition of an Electronic Health Record at a Pediatric Tertiary Center within an Academic Health System

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Keywords: Pediatrics, Patient Quality and Safety, EHR, Informatics

Background/Significance

The Electronic Health Record (EHR) is the standard of care and has been shown to reduce documentation time, improve guideline adherence and lower the number of medication errors.[1] While many benefits are known, there are risks intrinsic to individual EHRs and with implementation. Pediatrics presents a unique set of risks. Adult-oriented systems may lack functionalities required in the Pediatrics setting.[2] Standardization within an enterprise that incorporates multiple institutions and patient populations creates difficulty due to differences in level of care, equipment, medication practices and support systems.

Methods

Prior to implementation the enterprise established a multi-institutional and departmental group for clinical content development and site-specific interdisciplinary teams for workflows. Implementation was staggered in hospitals with our institution being the second group to roll-out after a tertiary care center which supported neonatal but no other pediatric services. Medication error rates were followed for pediatric-specific errors across all pediatric departments within our institution prior and after implementation. A pediatric-specific medication error prevention team was developed which compiled themes and mitigated issues in real time.

Results

At baseline, there was an average number of 26 medication safety reports per month. After roll-out, there was a 5-fold increase: 123 events the month of implementation. By month 3 post roll-out, the rate of reported medication errors had been restored to baseline. Issues identified that led to medication risks: 1) lack of congruency between EHR order, age context, pump library and stock availability; 2) lack of standardized medication concentrations across the enterprise; 3) computerized rounding without sensitivity for pediatric needs; 4) medication administration instructions not aligning with departmental or institutional policy; 5) the implementation of terminology for weights.

Conclusions

Review of safety reports and system fix requests highlighted themes related to both the need and risks associated with standardization. Prior to implementation there needs to be a clear pathway for rapid escalation and resolutions in place. Decisions and changes to the EHR, equipment, workflow and policies need to have pediatric representation and be examined from all age contexts. Future research and work needs to be focused on standards and guidelines on implementing an EHR that encompasses all age contexts.

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The Digital Team Member: Telemedicine Joins Clinicians at the Bedside for Neurology Assessment and Intervention

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Keywords: Telemedicine, Implementation, Process Change, Innovation, Super User, Accreditation

Introduction/Background

Newport Hospital holds The Joint Commission's Primary Stroke Center certification, requiring availability of around-the-clock neurologist coverage. The hospital is the first within the 4-hospital system to adopt a telemedicine service, providing real-time access 24/7 to a credentialed neurologist for expertise in patient assessment and treatment for patients experiencing neurological change. The following outlines the process of developing, implementing, and evaluating the initiative's integration, complementing in-house physician coverage, and continuing to provide high quality patient care.

Methods

The multidisciplinary stroke committee guided the healthcare system's first telemedicine initiative. Members included the Chief Medical Officer, information technology, critical care and emergency nursing and medicine, diagnostic imaging, and clinical informatics. The team's tasks included performing a gap analysis of two electronic medical record platforms, evaluating existing operational processes and workflow considerations and devising innovative operational/technological workflow processes for teleneurology consultation. The education plan encompassed both nursing assessment and skills fortification in addition to hands-on training, consisting of instruction on operating the new teleneurology computer cart as well as the cart's troubleshooting resources. The education rollout was multidisciplinary and employed a variety of methods: hands-on demonstration, question and answer forums, as well as practice runs with mock scenarios. These scenarios utilized the teleneurology cart and video connections using in-house and teleneurology clinical and technological experts for troubleshooting and end user support. Unit-based super users were identified and engaged to provide additional educational and clinician support. To supplement the training, informational reference binders were created and distributed to the units. Key training elements emphasized: innovative electronic medical record solutions, novel workflow development, nursing education on utilizing a new technology, and reinforcement of clinical team collaboration and role responsibilities within the newly defined workflows.

Results

Table 2: Telemedicine Utilization Since Go-Live February 2016

Quarter 1 2016	Quarter 2 2016	Quarter 3 2016	Quarter 4 2016
11	55	55	60

Discussion/Conclusion

Quantitative and qualitative data continue to be collected and reviewed monthly at various leadership and clinician focused department level meetings. The data include neurological/stroke quality metrics, patient/nurse experience, and utilization rates. Questions or issues related to the teleneurology service are reported up through leadership structures or entered in the internal quality improvement platform for leadership review. The Stroke Program Coordinator evaluates patients' experience through in-person interaction or post-discharge phone interview. Top priorities of the project continue to be focused on process improvement opportunities on an ongoing basis all while continuing to strive for and maintain consistent high quality patient care.

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Lessons Learned in Providing Clinical Decision Support for Medicare Certifications

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Keywords: Process Change, Clinical Decision Support

Introduction/Background

Although significant research has been done regarding decision support for the discharge planning aspect of case management nursing [1], literature on utilization review decision support is lacking. Utilization review entails the case manager nurse determining whether a hospitalized patient meets criteria for level of care as inpatient, observation, post procedure recovery, or insurance denial. If the case manager nurse determines that a patient meets inpatient criteria, and the patient has Medicare insurance, the case manager nurse is expected to ensure the attending physician attests that the patient is appropriate for inpatient level of care. At many hospitals, attestation is accomplished through a Medicare Certification Order. Case manager nurses can spend a significant portion of their time reminding attending physicians to complete this task.

Methods

To make this process more efficient for both case manager nurses and attending physicians, Partners Healthcare implemented a clinical decision support (CDS) intervention to alert physicians that a patient needs a Certification Order signed. Initially, the alert was built to simply appear to physicians if the patient was a Medicare Inpatient that did not already have a Certification order. It displayed a link to the Medicare Certification Order, as well as the option to downgrade the patient class, or to defer the alert.

Results and Lessons Learned

Per anecdotal reports from case management staff, leadership, and hospitalists, this CDS has increased compliance with the Medicare attestation process. However, achieving these results did not occur immediately. There have been multiple redesigns of the CDS intervention since the initial version was implemented. One of the lessons learned has been that in addition to inpatient class, one should consider classes of Surgery Admit and Psych Inpatient. Second, when research grants are used instead of Medicare, as payment for a hospital admission, the alert should not appear. Third, rehabilitation and psychiatric hospitals may not have the same requirements as acute care hospitals. Fourth, the alert should not appear in hospital outpatient departments, and fifth, the alert should not appear for emergency physicians or anesthesiologists. Sixth, be sure to only look for signed certification orders in the current encounter, and lastly be mindful of the display. Alternative follow-up orders for post-procedure recovery and observation were found to be confusing and were removed. These seven issues have been resolved, but one remaining issue is that if a physician accepts the order from the alert, but logs out without signing the order, the alert will not reappear again. The plan is to address this with education to providers because a technical fix is not currently available. Staff have also needed re-education that patients need to be checked out of appointments, usually in radiology areas that they go to during their admission, so that the hospital outpatient exclusion does not prevent the alert from appearing.

Discussion/Conclusion

Future CDS to alert the case manager nurse when a patient has used all allowable observation hours per his or her insurance may also prove to be beneficial.

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Historical Data Dependency Analysis to Guide CDS Implementation Readiness

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Keywords: Clinical Decision Support (CDS), Data Dependency

Introduction

At Partners HealthCare the Clinical Informatics (CI) team develops and maintains Clinical Decision Support (CDS) interventions utilized within a commercial enterprise Electronic Health Record (EHR). These interventions leverage a variety of clinical data captured within the EHR. Some clinical data were formerly captured and stored in Partners' legacy EHRs. In preparation for the vendor EHR implementation in 2015, some of that historical data were converted to the new system. Prior to implementation, 58 CDS interventions were identified as depending upon historical data that was not converted or was not captured in the legacy system. There was concern that a lack of this historical data would generate over-alerting (false positive firing). Over-alerting may increase the risk of alert fatigue and cause providers to ignore important CDS alerts.[1] To curtail false positive firing, any intervention determined to have a historical dependency constraint was temporarily deferred from release. Historical data dependencies could also result in under-alerting (false negative firing), but this was deemed to be a less compelling reason to defer implementation of the intervention. The aim of this project was to perform a post implementation analysis of historical data constraints for the 58 deferred interventions and to provide readiness recommendations for implementation.

Methods

A review of each of the 58 interventions that had been deferred was completed with each tagged with the type of historical data dependency constraint: a) procedures, b) surgical history, c) appointment or referral, and d) other. Each dependency type was then assessed to determine if, when, and how the historical data had been converted. Additionally, each intervention was analyzed to determine how far back in time it depended on the historical data. This look back assessment was done to establish if the dependency was still relevant or if ample time had passed since implementation. A historical data constraint risk was then determined for each intervention based on the existing constraint type categories and the CDS criteria look back time interval: 1) no risk, 2) false negative alert risk and 3) false positive alert risk. A readiness recommendation for implementation was done for each intervention based on the associated risk.

Results

The breakdown of historical data dependencies by type is as follows: a) procedure =42, b) surgical history=17, c) appointment or referral=15 and d) other=2. Twenty-one interventions were tagged with more than one data dependency. Fifty percent (N=29) of interventions depended upon historical data that had since been converted, whereas 45% (N=26) relied on data that had not been converted or had not been captured in the legacy system. Of those 26 interventions, 11 relied on historical data with a time interval look back of one year or less. The other 15 interventions had a time interval greater than one year. Taking into consideration the data conversion results and the look back time intervals, 55% (N=32) of interventions no longer had a historical data constraint risk, 41% (N=24) of interventions were determined to have a risk of false positive alerting, and 3% (N=2) of interventions were determined to have both a false positive and false negative alert risk. As a result of this analysis we concluded that the 32 interventions with no historical data constraints were ready for implementation whereas the 26 interventions with remaining constraints were not ready for implementation without additional safeguards.

Discussion

Upon discussion with CDS leadership, it was decided that the interventions without historical data risk would move through the typical CDS lifecycle, which includes a period of routine monitoring. The interventions with remaining historical data dependency constraints would move through the CDS lifecycle however would undergo stringent alert activity monitoring prior to implementation. Additionally, whereas many months had passed, all 58 interventions, regardless of risk, would first be reevaluated for relevancy as well as alignment with EHR configuration.

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Examination of Self-Reported Informatics Competencies of Nurse Leaders Using NICA-NL©

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Keywords: Competency, Informatics, Nurse Leaders, Technology

Introduction/Background

A large academic medical center is implementing a new integrated electronic health record (EHR). Nursing leadership would like to know if the nurses in leadership positions are prepared to utilize information technologies to collect and analyze data to make business and patient care decisions.   Nurses working in leadership positions should possess the required informatics competencies to be successful in adopting new technologies to support all aspects of nursing practice including research, evidenced based practice, administration, education and measurement of quality and outcomes.[1]

Methods

This study used a cross sectional, descriptive design. The NICA-NL © instrument was used with permission.[2] The instrument is specific to the role of nurse leader.   NICA-NL © assesses seventy four competencies deemed important for nurse leaders.

A convenience sample of nurse leaders was used. There were 147 nurse leaders in the target population that meet the inclusion criteria and were invited to participate. An email describing the study was sent to the target population. The subjects elected to participate by clicking on the link to the survey.

Results

Fifty-five nurse leaders completed the survey, a response rate of 37%. No differences existed between reported competencies and education level or years in position. There were differences that existed between informatics competencies and age, years of experience, professional position or if the participants had worked as a clinical analyst or taken a nursing informatics course.

Nurse leaders with more experience reported adequate or greater competency in several areas such as the ethical principles for the collection, use and dissemination of data and information. The nurse leaders with less than 10 years of experience reported greater competency than was expected in several key areas such as the ability to communicate a systems and nursing vision about the benefits of health information technology.

Nurse leaders in the role of nurse manager, clinical coordinator and nursing supervisor showed less competency in several areas. The areas include education about the costs associated with the implementation and ongoing use of HIT, issues related to data quality and integrity, and workflow analysis and design.

Discussion

The results demonstrated several key areas as potential professional development opportunities.   There were several areas of adequate or greater competency reported by the nurse leaders. At the time of the study the organization was in the design phase of new EHR. The results may reflect the increased awareness of the nurse leaders related to ongoing dialogues related to the process of implementing the new system.

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Adoption of Inpatient Communication Utilizing Secure Text Messaging on Smart Devices

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Keywords: Communication; Mobile; Provider-Provider Interaction; Secure Texting; Technology Adoption; Mobile Applications; Patient Health Information (PHI).

Introduction/Background

The use of technology with smart devices for clinician to clinician communication requires secure applications to allow a free flow of accurate and timely information. "In hospitals, effective and efficient communication among care providers is critical to the provision of high-quality patient care"[1]. Once a technology is deployed, adoption is just as important to its use for frontline providers, given the nature of hospital care teams and where they practice "If it is our intention to improve the quality, safety and outcomes of healthcare, then a focus on the process of communication and the ways in which technology supports their needs is imperative." [2] Yale New Haven Hospital (YNHH) deployed an application which provides voice over IP with secured texting and limited access to personal health information (PHI). The texting function of the application provides communication within and between caregivers and departments on YNHH campuses. The focus of this study was staff perception and adoption on our Saint Raphael Hospital location, a 450 bed facility within our YNHH 1200 bed main campus. YNHHS currently produces over 25,000 text based messages daily for more than 6000 registered providers in all roles. The segment of St. Raphael's campus secured text communication was over 6000 text messages per day.

Methods

Staff Perception and adoption was measured using an online survey of 9 questions on a Likert Scale on a campus which has had secure texting for over 2 years. The survey was open to: nurses, patient care associates/patient care techs, unit clerks/business associates, and other care team providers. Survey responses on clinician perceptions were collected in an on-line survey using a 1 to 5 Likert scale, with 1. being Strongly Agree and 5. being Strongly Disagree. This was used with the PDSA (Plan, Do Study, Act) model[3], allowing insight from individual users , units and service lines which we are able to apply to improve our overall communication workflow.

Results

The survey results showed use of this technology was well accepted by staff with agree or strongly agree receiving the highest percentage in the responses with combined aggregates for each question ranging from 45.5% to 84% Question 4 did show a significant percentage of disagree at 20.45% and question 8 had the highest neutral score.

Discussion/Conclusion

The overall survey results suggests that a mobile, secure communication application with texting improves communication and workflow efficiency among staff in inpatient setting. Question 4, "Use of a texting application helps to respond to patient requests" even though the results were positive (31.82% strongly agree, 27.27% agree) there was a significant group that did not agree with this (20.45%) which will require additional study to understand. Question 7 is a specific question to function with the actual application. Here data mining will be used on text content to determine usage and improvements. In conclusion the acceptance by clinical staff of mobile applications as an enrichment to clinical communication could extend the ability of staff to improve care and therefore patient outcomes.

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