Trends in Clinical Informatics: Poster Presentation

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Patient Controlled Analgesia (PCA): Quality Improvement Project to Decrease Pump Programming Errors

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Keywords:
Patient Controlled Analgesia (PCA), Smart infusion pump, Quality improvement, Patient safety, Pump programming errors

Introduction/Background
Patient-controlled analgesia (PCA) is a medication delivery system that allows patients to self-administer their own intravenous pain medication. The PCA Smart Infusion Pump has built-in safety features or limits that allow the patient to self-administer medication within a safe range. The built-in safety features of the pump are dependent on accurate pump programming by the clinician. If pump programming errors occur patients are at increased risk for both over sedation and inadequate pain control.[1,2] To meet the wide dose range of pain management needs for patients, two PCA syringe concentrations are available, a low and high concentration. In 2017, the BWH Smart Pump team identified a trend in incorrect programming of these PCA opioid syringe concentrations.

Methods
The BWH Smart Pump team collaborated with clinical nursing staff, pharmacists, anesthesiologists, Quality and Safety leaders, Risk Management, and Partners eCare (PeC) teams to identify risk mitigation strategies and create a tiered implementation plan including:

- Interdisciplinary root cause analysis sessions targeting end user nursing staff to identify workflow and system issues that lead to programming errors
- Collaborative expert work group led by PeC to improve the ordering and display of PCA orders in the electronic health record (EHR) and added decision support to alert nurse if the PCA dose documented on the MAR or Flowsheet did not match the medication order
- Smart Pump drug library rebuild to improve the programming user interface per clinician feedback
- High alert labels on concentrated PCA syringes
- Hospital-wide education initiative

Results
In 2017, 11 incidents of incorrect PCA opioid syringe concentration programming were reported. Since implementing the risk mitigation strategies described above in October 2017, no further safety reports regarding incorrect programming of the opioid PCA syringe concentrations have been filed.

Discussion/Conclusion
Human graphic user interface (GUI) factors significantly impact patient safety technology effectiveness. End user participation in the creation and analysis of Smart Infusion Pump GUI's is critical for risk reduction. It is well recognized that opioids are high risk medications and pump programming is a complex, high risk process. The entire PCA process is also complex and has potential for errors; however, misprogramming the PCA syringe concentration leads to 10 fold overdose or underdose outcomes at our institution. Staff involvement in our risk mitigation plans was key to its success.

References
1. Grissinger, M. Misprogramming Patient-Controlled Analgesia Levels Causes Dosing Errors. Pharmacy and Therapeutics, 2012; 37-2;74–75
2. Hicks, R., Heath, WM., Sikirica, V, Nelson, W, Schein, J, et al. Medication Errors Involving Patient-Controlled Analgesia. Joint Commission Journal on Quality and Patient Safety, 2008; 34-12;734-742

Integrating Multiple Vendors into a Custom Patient Portal

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Keywords: Patient Portal, Electronic Health Record, Access

Introduction

MyChildren's Patient Portal has been available to patients at Boston Children's Hospital (BCH) since 2013. The platform allows patients access to their health information, as well as contact their providers, and soon the portal will host virtual visits. The portal is developed and maintained by several teams within BCH, including the Web Team, the .Net team, Clinical Education and Informatics team, and the Electronic Health Records application team. We have successfully embedded health records and patient education applications into the portal framework. Currently we have projects to integrate portions of functionality from our registration vendor and include additional functionality for health records. As an early adopter, BCH has seen increased patient engagement from using MyChildren's as part of their care.

Methods

Our custom portal solution allows us to meet the specific needs of a pediatric population. Our provisioning process is designed to ensure the security of our patients' privacy. We operate a bicameral EMR system with two different vendors for registration and documentation. In order to create a portal that will provide more access and transparency for our patients, we have needed to create plans to integrate multiple vendors. In 2016, we successfully integrated portions of our EMR solution into our portal. This has created a streamlined messaging solution for our providers and patients. This upgrade supports the process of sharing clinic notes on the portal as well. Also in 2016 we released patient education onto the portal which has allowed patients to education documents after their visit or inpatient stay. In 2018 and 2019, we have plans to incorporate two key features from our EMR vendors. The first project will add advanced billing functionality, self-scheduling, and functionality to update demographics. The second project allows patients to enter medical information directly into the EMR.

Results

Our EMR integration has led to a spike in portal usage. The month following go-live we saw an increase in registration by 200 additional users. This is due in part because of our marketing efforts, and partly because providers have a streamlined method of communication with patients. The success of this project has led to new projects that advance features for registration and documentation on the portal. As interest in the portal grows, there are more possibilities for integrating services that provide for patients.

Discussion/Conclusion

As technical work begins, we will begin testing how patient entered data impacts downstream systems. Alongside the technical work to carry this project out, we are assessing marketing and training needs to align with our go live date. Many other teams will be engaged to complete this portion of the project.

References

1. Chimowitz, Hannah, et al. Empowering Informal Caregivers with Health Information: OpenNotes as a Safety Strategy. The Joint Commission Journal on Quality and Patient Safety, 2018; www.sciencedirect.com/science/article/pii/S1553725017302404

Nursing Informatics Role in Device Integration of Hemodialysis Machines to the Electronic Health Record

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Keywords: EHR Device Integration; EHR Hemodialysis Machine Integration; Biomedical Device Integration

Introduction/Background

Brigham and Women's Hospital-BWH an Academic Medical Center in Boston deployed PeC a Partners Healthcare customized version of an Electronic Health Record using the EPIC- Electronic Healthcare Record software in 2015. An integral part of that implementation was an extensive network of interfaces to support biomedical device integration "BMDI". The BMDI focused on physiologic monitoring, ventilators and fetal monitoring. But shortly after go-live it became apparent that BWH should take advantage of device integration for the Hemodialysis machines. In 2016, BWH purchased new dialysis machines that could integrate with EPIC. Approval to assign resources to work on this project was obtained. A taskforce of bioengineering, Partners e Care Team (PeC), nurse Informaticists (NIs) and hemodialysis nurses was formed to assess the workflow and to make decisions and support the project. The project plan for the group included which flowsheet rows to interface, naming conventions, flowsheet modifications, education needs and go-live plan.

Methods

The NI members of the taskforce shadowed the dialysis RNs to document current workflow. A review of data output from the machines that would be interfaced as feedback to the flowsheets was done and a gap analysis was performed to see if mapping from the machines to the existing flowsheets rows would be possible. This involved analyzing data point names in the dialysis machines and comparing them to the flowsheet rows built in the EHR.

The results were analyzed by the group; changes and mapping were made to the flowsheet rows on our recommendations. Integration testing was performed on all the devices to assure network and data integrity.

The NI members created a plan to train and support the go live in April 2017. They worked with the Nurse Director and RN staff to develop materials and training for the staff. Tip sheets were developed and RN users were identified and trained to support the users. The NIs were available for at-the-elbow support and to support the RNs who were identified as the experts to support the users.

Results

The integration of the Dialysis Machine Data resulted in the RN requiring less time to document at the computer, as well as increased nurse satisfaction. It also improved the abillity of the RNs to capture data accurately, eliminate transcription errors and provide more data for clinicians to assess hemodialysis treatments

Discussion

Centers for Medicare and Medicaid Services (CMS) and Department of Public Health (DPH) have very tight regulatory requirements for dialysis units that treat outpatients. The Brigham Dialysis unit is licensed as both an inpatient and outpatient unit, and therefore is subject to these regulations. Integration of the Fresenius dialysis machines to send information directly into PeC significantly reduced the manual documentation requirements, and by extension, the risk of an inadvertent policy breach associated with body fluid exposure during dialysis treatments.

NIs participation in the Hemodialysis Device integration resulted in better planning and implementation for the project. Nursing workflows were addressed during gap analysis and design of the flowsheet, as well as training and implementation strategies.

References

1. Raths, David "CIOs must bridge the digital divide between devices and electronic medical record" Healthcare Informatics, February 1, 2009. http://www.healthcare-informatics.com/article/medical-device-integration?page=2 Accessed 3.1.2018

Documenting Across the Continuum: Tracking Intentionally Retained Foreign Objects (IRFO) in Trauma Patients

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Keywords: Clinical Documentation, Process Change, Retained Foreign Objects, LDA, Epic, Sponges, Counts

Introduction/Background

Trauma patients with abdominal and thoracic wounds come to the Operating Room (OR) in emergency situations and are often sent to ICU with an open wound packed with sponges, towels, or other foreign objects left in for therapeutic reasons. These patients return to the OR multiple times to have the packing changed or removed. Historically, there was no standardized way to document the presence of these items in one location with tracking history. All clinicians struggled, searching free text notes or multiple, individual OR case logs to find the most recent information. Feedback from our perioperative nursing staff and Nursing Informatics Council determined that a process for tracking was needed that was easily accessible and would follow the patient throughout their hospital encounter.

Methods

Our current Electronic Health Record (EHR) is Epic 2017. In Epic there is a section called LDAs (Lines, Drains, & Airways). We devised an LDA screen specifically for IRFO. Any clinician performing the procedure where the object is being intentionally retained creates the initial LDA. The IRFO LDA is visible to all clinicians either in an LDA section of a navigator, directly on the LDA flowsheet, or in the summary section of the EHR. Nursing Handoff reports include IRFO LDA information. Inpatient nurses can include the information on their daily worklist. Upon return to the OR, a clinician edits the IRFO screen and documents IRFO type and quantities inserted. Saved quantities overwrite current values. Previous values are then saved in an audit trail at the bottom of the screen. An IRFO icon appears on the OR status board when a patient comes to OR with an active IRFO LDA in place. The patient header in the EHR also displays the presence of an IRFO.

Results

Creation of a specific LDA screen for IRFOs has allowed all clinicians caring for the patient to have one location to document and track intentionally retained objects therapeutically left inside a patient. When the wound is officially closed, and all packing is removed, the nurse documents the removal date and time to complete the IRFO LDA documentation screen. History of the IRFO for this patient is saved in the EHR.

Discussion/Conclusion

Or goal was to standardize documentation for at-risk items called IRFOs. The screen created has increased situational awareness for all providers caring for the patient. We believe risk related to intentionally retained objects has decreased due to consolidation of event tracking, thus increasing patient safety. We believe clinician satisfaction has improved with increased visibility of retained foreign objects. Six months after implementation we plan on analyzing employee satisfaction and volume of incident reports related to IRFOs

References

1. The Joint Commission. (2013). Preventing unintended retained foreign objects. *The Joint Commission Sentinel Event Alert*, (51).
2. Murdock, D. B. (2008), Trauma: When There's No Time to Count. AORN Journal, 87: 322–328. doi:10.1016/j.aorn.2007.07.008
3. Authority, P. P. S. (2009). Beyond the count: preventing retention of foreign objects. *Pa Patient Saf Advis*, *6*(2), 39-45.

Emergency Department Nursing Protocol Orders

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Keywords: ED crowding, ED throughput, Length of stay, Nursing standing orders

Introduction/Background

ED crowding is a multi-factorial problem caused by increasing patient volumes with a lack of inpatient capacity, shortages of staff, long turnaround times for diagnostic results, and limited geographic space in the ED[1]. Prior studies have evaluated strategies for improving the "front end" operations of the ED to improve cost, quality, and operational efficiencies[2]. Nurse-initiated protocol orders prior to physician evaluation may reduce overcrowding by increasing ED patient throughput[1].

Methods

We convened a multidisciplinary group of ED nursing and physician leaders to validate content for nurse-initiated order panels to initiate care for cohorts of patients with specific chief complaints at ED triage. After validation by billing and compliance, we built these order panels into the electronic health record. In this preliminary quality improvement study, we evaluated a total 7,649 adult encounters at six community ED's within the network over nearly two weeks after implementation. Patient demographics and operational metrics were compared between encounters where a nurse-initiated protocol was used versus when it was not.

Results

Nurse-initiated protocol orders were used in 8.4% of all encounters. They were used more frequently in women compared to men (62.6% vs 37.4%), and in encounters with Emergency Severity Index (ESI) 2 and 3 (medium to urgent severity). When triage protocol orders were placed, the time from ED arrival to first physician assignment was longer by approximately 40 minutes (108 min vs 67.6 min). Encounters where the protocols were used had longer overall ED lengths of stay (443 min vs. 304 min) and longer times between first physician assignment to first ED disposition decision (330 min vs. 201 min). Neither finding was statistically significant.

Discussion/Conclusion

Nurse-initiated protocol orders placed in ED triage are a potential mechanism to reduce ED overcrowding by improving patient throughput. In this pilot evaluation, we found robust use of these protocols after less than two weeks of deployment. Longer operational metrics may be explained by the more frequent use of these protocols at times of high ED crowding. Future steps include analyzing a larger sample, and accounting for variability in ED census volumes to better interpret the differences in operational metrics.

References

1. Hwang, Charles W, Payton, T, Weeks, E, Plourde, M. Implementing triage standing orders in the emergency department lead to reduced physician to disposition times. Advances in Emergency Medicine, 2016
2. Wiler, J, Gentle, C, Halfpenny, J, Heins A, Mehrota, A, Mikhail, M, Fite, D. Optimizing emergency department front end operations. Annals of Emergency Medicine, 2010; 55(2) 142-160

Residual Soil Testing of Endoscopes

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Keywords: Data-Driven Quality Improvement, Patient Safety & Quality

Introduction/Background

In April of 2015, the CDC issued a warning pertaining to the transmission of carbapenem-resistant Enterobacteriaceae (CRE) via duodenoscopes, an endoscope used to examine the biliary system. This has led to a larger discussion surrounding patient safety and the reprocessing of endoscopes. No requirement exists regarding testing or culturing endoscopes, although the investigation into mitigating the risk of infection via these devices continues.

In January 2017, as part of our data-driven quality improvement program, the Gregory Endoscopy Centre at Brigham and Women's Faulkner Hospital implemented residual soil testing of endoscopes to assess the efficacy of manual cleaning, the most critical step in endoscope reprocessing. Informatics has assisted us in collating and communicating the results to staff, as well as pointing the way forward.

Methods

Healthmark's Channel Check was selected as the method of testing. The kit contains test strips with 3 testing pads. When submerged in water irrigated through the endoscope channels, the pads will change colors when exposed to carbohydrate, protein, and/or blood. When the strip reveals the presence of soil, the scope is manually cleaned again and re-tested. Results are recorded to identify which scope tested positive and which tech processed it. Six endoscopes are tested daily and rotated to ensure that all inventoried endoscopes are tested weekly

Results

Six hundred and sixty tests were performed from January through June, 2017. 8.25% of endoscopes tested, or 54 of the 660, contained residual soil. In June of 2017, staff re-education was done and an additional flushing step was implemented. These steps resulted in the reduction of the percentage of endoscopes with residual soil to 2.6%. The months of September and October saw an increase to 8% in endoscopes containing residual soil. It was discovered that the additional flushing was being done with clean water contained in the sink. Since the sink itself was re-used with each endoscope, it was presumed to have released contaminants into the water. In November 2017, Medivator's Scope Buddy high velocity flushing system was initiated. This resulted in a drop in residual soil to 2% for November and December 2017.

Discussion/Conclusion

Through the residual soil testing program we discovered the importance of remaining in close contact with the reprocessing staff and communicating results to them in real time, that despite brushing and flushing, the components of biofilm are very challenging to remove, and that upper endoscopes and endoscopes with elevator channels retain residual soil at a higher rate than colonoscopes. Our next steps will consist of data collection to assess the actual incidence of retained residual soil in each type of endoscope, any association that may exist with an individual technician, and which substance is retained most often.

References

1. Petersen BT. Duodenoscope reprocessing: risk and options coming into view. http://www.giejournal.org/article/S0016-5107(15)02650-4/fulltext. Accessed May 27, 2016.
2. Petersen, BT, Cohen, J, Hambrick, D, et al. Multisociety guideline on reprocessing of flexible endoscopes: 2016 update. Gastrointestinal Endoscopy, 2017; 82:2; 282-294

Data, Data, and More Data: Is it Meaningful?

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Keywords: Data, Population Health, Data Validation, Meaningful Data, Mapping data

Introduction/Background

The implementation of a Population Health IT platform is both cumbersome and complex. The role of the informatics specialist is essential in the system analysis and design for a successful outcome. At the heart of the platform lies data. Data, by definition, "are discrete entities that are described objectively without interpretation"[1]. Capturing data is not enough. It must be validated, standardized, and mapped or there cannot be meaningful use of it in population health management. "By discovering associations and understanding patterns and trends within the data, big data analytics has the potential to improve care, save lives and lower costs."[2]

Methods

The initial phase of data on-boarding and validation at our institution included the Electronic Medical Record (EMR) and insurance payer data. An expert vendor team performed mappings which were then validated by the informatics specialists and project team. This data was validated against the Enterprise Data Warehouse (EDW), the EMR/patient record, payer claims, and clinician-collected data. Queries, Business Objects, reference literature, and manual chart reviews were used in the validation process.

Results

Validation was targeted to each solution and prioritized based on the project timeline. Through the validation process gaps, inaccuracies, and discrepancies were identified. A collaborative approach was taken to work through issues identified. Significant discrepancies were often attributed to differences in validation and details in the queries performed. A sample of issues identified is provided in Table 1.

Table 1: Mapping issue

Issue	Resolution
Labs mapped to orderables	Remapped to result order
Immunizations required additional detail	Remapped including historical data
Discrete task assay (DTA) mappings too generic	Remapped to include nomenclature on relevant DTA's

The added level of specificity and detail has improved the data and validation outcomes. Validation and remediation of both data and mappings is an ongoing cyclical process. It also became evident early on that there needed to be standardization and transparency in the validation process. Documents are currently being procured to facilitate this process. Changes and ideas were presented to the vendor and discussed at multi-center, interprofessional meetings for review and approval.

Discussion/Conclusion

The Informatics Specialist must understand the context of the data, the measures, and the analytics in order to facilitate validation and accurate mapping. Clearly defining the validation process makes it a more efficient process. Efforts to enhance and improve the data and mappings continue.

References

1. American Nurses Association. (2015). *Nursing Informatics: Scope and Standards of Practice, 2nd Edition* (page 2). Silver Spring, MD: Nursesbooks.org
2. Raghupathi, W., & Raghupathi, V. (2014). Big data analytics in healthcare: promise and potential. *Health Information Science and Systems*, *2*, 3. http://doi.org/10.1186/2047-2501-2-3

Nurse-Driven Process for Implementing an Electronic Acuity Tool in Intensive Care Units

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Keywords: Patient Acuity, Nursing Assignment, Nurse Driven IT Process, Patient Safety and Quality.

Background

In 2015, the Commonwealth of Massachusetts passed legislation 958 CMR 8.00 to establish patient assignment limits for registered nurses in ICUs licensed by the Massachusetts Department of Public Health. As part of the law, hospitals must select and implement an electronic acuity tool to guide and track assignment- making in ICUs. Mass.Gen.Laws c.111& 231(2015). [1] Tufts Medical Center/Floating Hospital for Children used this as an opportunity for nurses to review their practice and implement a tool that would support their care environment.

Methods

Tufts Medical Center gathered a team of nurses from each intensive care area who were clinical experts in their care environment. They were termed Patient Outcomes Experts or POEs. The POEs were charged with selecting an acuity tool by evaluating a number of off- the -shelf commercial products that provide acuity and workload measurements and guide staffing needs. Each member of the committee rated each tool using a pre-established survey and questionnaire, judging based on functionality, value added, usability and other key metrics. They ultimately decided on the Cerner Clairvia acuity tool because it measures patient acuity rather than nursing workload and tracks patient outcomes based on nursing documentation rather than requiring nurses to input additional information into the tool. Once the tool was selected, the nurses began the process of analyzing their documentation content and practices and made decisions about the design and configuration of the tool. Once configured, nurses performed an auditing process to ensure the data calculated by the tool was accurate and could be relied upon to guide staffing decisions on each unit.

Results

The method of gathering nurses to lead the process of reviewing, selecting and implementing an acuity tool empowered nurses to review their practice and become engaged in the process of implementing the tool. They were able to improve the quality of their documentation content and practices and develop an acuity tool that reflects patient acuity and patient progress

Discussion/Conclusion

Tufts ICU charge nurses are in the process of learning to refer to the acuity tool data when creating electronic assignments and extract data from the tool. We believe this tool will help predict staffing needs and optimize patient care.

References

1. Mass. Gen. Laws ch. 111, § 231 (2015), Patient Assignment Limits for Registered Nurses in Intensive Care Units in Acute Hospitals retrieved 2/28/18 from https://www.mass.gov/regulations/958-CMR-800-patient-assignment-limits-for-registered-nurses-in-intensive-care-units-in

Multi-disciplinary approach to infusion tracking for novel investigational drug protocols

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Keywords: Infusion tracking, investigational drugs, research protocols, antibody infusion

Introduction/Background

Novel therapeutic approaches in pediatric hematology and oncology introduce new complexities in medication administration, monitoring and documentation. Accuracy in the administration of investigational medications is of vital importance both in the clinical care of the patient as well as ensuring protocol integrity and compliance[1]. The goal of this practice and education project was to develop a tool to assist in the nursing documentation of a prolonged infusion of an investigational drug.

Methods

A multidisciplinary group consisting of an oncology pharmacist, a research nurse and an inpatient staff nurse collaborated to develop an infusion calculator that supports hour by hour assessment of the dose and volume infused. The calculator allows for real time assessment of the dose delivered and provides a method by which infusion accuracy can be confirmed. The intent is to have the calculator integrated into EMAR to reflect actual drug amounts administered for specific time periods. The calculator has the ability to reflect the volume and account for slight modifications due to intentional interruptions by the medical staff, rate changes and possible pump malfunctions.

Results

This tool allowed real-time tracking of the drug which was being administered for this protocol. The tool also helped with the early detection of additional dosing which needed to be ordered and prepared. It helped the patient and family better anticipate the duration of the inpatient stay increasing patient satisfaction. The tool also encouraged increased collaboration of the health care team ensuring the safe delivery of a new investigational drug.

Discussion/Conclusion

Continuous quality improvement and evaluation of the effectiveness of this tool has been completed on a subject by subject basis. Overall, positive feedback has been solicited relating to ease of use and functionality. All members of the team found the tool to be easy to use, especially when preparing for additional dosing to allow the patient to receive their goal dose. Having the exact dose amounts calculated out in real time was beneficial to all members of the team.

References

1. Olinghouse, C. Development of a Computerized Intravenous Insulin Application (AutoCal) at Kaiser Permanente Northwest, Integrated into Kaiser Permanente HealthConnect: Impact on Safety and Nursing Workload. The Permanente Journal, 2012; 16:3; 67–70.

Quality Improvement Project for Patients with Central Venous Catheters: Utilizing Smart Phrase Technology to Educate Central Venous Catheter Patients at Discharge

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Keywords: After Visit Summary, Central Venous Catheters, Patient Education, Central Line Associated Bloodstream Infections, Discharge Instructions, Electronic Medical Record, SmartPhrases

Introduction/Background

Central venous access is a commonly performed procedure in Interventional Radiology (IR). With the deployment of the Electronic Medical Record (EMR) there was no standard set of discharge instructions available for patients receiving Central Venous Catheter (CVC) placements in IR. Because oncology patients have a high risk of developing Central Line Associated Bloodstream Infections (CLABSIs), there is a need for proper education for patients and families that are responsible for caring for their CVC independently, once discharged. An intervention to address this was to provide written discharge materials to patients about the necessary care of the CVC, which can increase patients' knowledge of the CVC and help them achieve self confidence in maintaining their access at home.[1] Nurses are often the first to initiate patient education and developing and utilizing SmartPhrases that have been developed from legacy paper discharge instructions will also enhance nursing knowledge on current CVC practices. This will facilitate CVC teaching and provide resources to enhance the patient education discharge processes.

Methods

Beginning in April of 2017 and over the course of the next three months, using an interdisciplinary collaborative approach with practice providers and nurses, we began the systematic process of reviewing our current written patient discharge information. Through the use of SmartPhrase development, a feature in the EMR that allows users to create a word document that can be saved and shared with other users, we were able to improve and integrate the pre-existing patient discharge education materials into the Electronic Medical Record (EMR). SmartPhrases are text, ranging from one word, to multiple pages of material, generated by typing the name of the SmartPhrase, preceded by a period. This solution allows providers to customize and attach the Patient Discharge Instructions content to the After Visit Summary (AVS) which then becomes part of the encounter documentation in their Medical Record.

Results

The result of this project has been successful and provides a standard set of CVC discharge teaching information for patients and their families, and nurses to review together at time of discharge. IR post procedure nurses are continuously monitoring each CVC patient and the associated discharge instructions to educate the patient using the text that populates from the CVC SmartPhrase in the AVS. This is printed for patients' reference and resource.

Discussion/Conclusion

Insufficient care instructions may impede the ability of patients and their families to safely care for their CVCs at home and may contribute to complications and readmissions. Using the innovation of technology, SmartPhrase were developed from existing legacy paper based forms. The project was initiated to revise and standardize the existing written materials for patients and families caring for their CVCs at home, provide additional resources to nurses to teach patients about CVC discharge care, and reduce the incidence of CLABSI's. Since the initial implementation, there has been positive feedback from nurses, providers, and patients and families.

References

1. Park, JY. Implementing a central venous catheter self-management education program for patients with cancer. Journal of Oncology Nursing, 2016; 25:12; 1-8.

Empowering Bedside Nurses to Drive System & Workflow Enhancements

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Keywords: Nursing, Informatics, Shared Governance, Information Technology, EPIC

Introduction/Background

Nurses have a distinct role in the uncontested space generated by/within the new care modalities enabled by technolog[1]. Boston Medical Center's Chief Nursing Information Officer (CNIO) wanted to form a Nursing Informatics Council (NIC) to ensure bedside nurses would have a voice in the refining of the Electronic Medical Record (BMC calls the EPIC EMR system eMERGE). In partnership with Nursing Leadership it was decided this council would be beneficial in revising and adding to the existing EMR to have it best reflect the workflow done by the nurse.

Methods

BMC's Nursing Informatics Council started October 2015 with monthly day-long meetings that occur the 3rd Thursday of every month. The first-year membership included 25 staff nurses covering multiple areas including Inpatient (medical, surgical, pediatrics & critical care), Perinatal, ED and Perioperative areas. The committee was led by the CNIO, Assistant CNIO while the Nurse Informaticists and Trainers helped facilitate the meetings.

Application process for membership included recommendations from Nurse Leaders. The 2nd year membership increased to 35 staff nurses when we added ambulatory, endoscopy & observation units.

Members' role was to include being a Change Agent, Subject Matter Expert, and Communicator to their units while driving education and support for system changes. Initially we had all members bring three items that they wanted improved within the system and spent much of the meeting discussing expectations. Each month's agenda includes a welcome, minutes review, and update on current projects. Hot topics are presented that need staff feedback. There is time set aside to discuss staffs' unit's requests for improvements. Other disciplines come to get nursing feedback on interdisciplinary projects. Meetings also include staff education of best practices for the system. There are breakout sessions in the afternoon so groups can focus on specialty area topics.

Results

Nurses in the information technology and clinical arena have partnered to implement and optimize the eMERGE system. NIC has sponsored many projects that have improved nursing documentation including Joint Commission requests, safety initiatives, and efficiency changes. These include changes to documentation of: pain assessment process, restraints, blood transfusion, influenza vaccination process, dosing/actual weight for ICU titration, safety bundles in Critical Care, EP & ED device integration, IPASS- (integration with Epic), wound documentation, worklist and navigator retooling, Nursing Care Plan search options, and IV Flush changes for decreasing central line infections. We have expanded their roles to include user acceptance, testing team, training, and activation support

Discussion/Conclusion

Our council has helped define and highlight this role. This committee strives to promote autonomous participation in the decision making process that is vital in making shared governance successful[2]. Although there is still much work to be done, the opportunities and collaborations are endless when teams work together. The Nursing Division has found the NIC to have improved communication and the change process for IT initiatives in Nursing. They have given invaluable input into many improvements in quality and workflow processes. NIC has helped improve patient safety, documentation compliance and staff satisfaction with IT systems.

References

1. Booth, RG. Informatics and Nursing in a Post-Nursing Informatics World: Future Directions for Nurses in an Automated, Artificially Intelligent, Social-Networked Healthcare Environment. Nursing Leadership, 2016; 28:4; 61-68.
2. Joseph, ML, Bougue, RJ. A Theory-based Approach to Nursing Shared Governance. Nursing Outlook, 2016. 64:4; 339-351.

Racing to the Finish Line, Ensuring a Successful EMR Launch

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Keywords: Clinical Documentation, Electronic Health Record, Teaching Styles, Curriculum Development

Introduction/Background

In preparation for a new electronic medical record (EMR), Nursing Professional Development (NPD) practitioners in collaboration with Clinical Informatics (CI) specialists identified that traditional classroom training only provided basic functionality of the system. Nursing staff needed additional support to connect basic functionality with relevant and unit-specific nursing workflows. Additionally, many areas did not utilize an integrated EMR which created a significant practice gap. NPD and CI developed and implemented creative strategies to engage learners, enhance knowledge, and promote comfort with the new EMR.

Methods

Recognizing that this challenge would take a team approach, NPD practitioners and CI specialists formed Practice Integration Teams, called the PIT crew. Each team was charged with helping to prepare nursing staff, which included nurses, assistive personnel, and unit secretaries, for the transition to a new EMR. The PIT crew's goal was to help bridge the knowledge gap using relevant and high-risk workflows. The team used the concept of a race car PIT crew to engage nursing staff in fun, interactive and creative ways. Brief case-based scenarios were developed based on high-volume, high-risk and problem prone workflows. To engage the nursing staff, the teams provided on-unit education for all shifts using visual management tools and incentives. The team used the scenarios to guide the nursing staff to practice documentation based on their unit's needs, while the PIT crew provided guidance, answered questions, and clarified topics. The team also facilitated drop-in classroom sessions utilizing the same scenarios.

Results

The PIT crew facilitated a total of 1,630 on-unit sessions, including 12 overnight shifts and eight open classroom sessions. The team rounded on 41 units and engaged 2,743 nursing staff in a PIT session (Table 1). The team exceeded the goal of engaging 80% of nursing staff in this education. The statistics include nursing staff who participated in multiple sessions. The feedback from nursing staff and the leadership team was positive, and nursing staff found value in the time spent with the PIT crew. The nursing staff were engaged in learning and encouraged their peers to take part in the practice sessions. All sessions provided additional opportunities not only for practice, but to ask relevant questions.

Table 1: PIT Sessions

Number of PIT Teams	Total Number of Sessions	Total Number of Staff
8 teams	**1,630 on unit**	**2,721**
	8 classroom	**22**

Discussion/Conclusion

The PIT crew met the intended outcome of integrating knowledge and workflow for a successful transition to the new EMR. The goal of the project was to have 80% of nursing staff participate in a PIT session. The PIT crew used fun and creative strategies to engage nursing staff in learning the new EMR. Based on the success of this approach, the PIT crew will be utilized again for future EMR updates and education.

References

1. Billings, DM, Halstead, JA. Teaching in nursing: A guide for faculty. 4th ed. St. Louis, Missouri: Elsevier; 2012
2. Chang, CP, Lee, TT, Liu, CH, Mills, ME. Nurses' Experiences of an Initial and Reimplemented Electronic Health Record Use. CIN: Computers, Informatics, Nursing. 2016; 34(4), 183-190. doi: 10.1097/CIN.0000000000000222.

Implementation of a Plan of Care

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Keywords: Plan of Care, Nursing documentation, Problem- oriented charting, Improving staff use of plan of care

Introduction/Background

Historically Brigham and Women's Faulkner Hospital (BWFH) had an Electronic Health Record (EHR) that provided a list of nursing interventions that did not correlate with patient problems or an organized plan of care. In 2015, BWFH implemented an integrated EHR (Epic clinical systems product). Epic provided an evidence-based plan of care and patient education product. Staff were unable to successfully utilize the EPIC system to its fullest and often documented only "progressing" or "not progressing" without meaningful context. Upon chart review it was difficult to follow the patients' progress as there was a lack of documentation against the plan of care. Staff's perception was that the process was time consuming and diverted them from patient care. The nurses' contribution to patient care appeared to be missing in chart audits.

Methods

A manual chart audit showed 23% of charts had a plan of care that was patient-specific or showed evidence of progress towards goals. An audit tool was utilized daily by project team members to review the presence of specific problems to this population of patients. Two weeks of baseline data were obtained via manual chart audits. Staff champions chose common problems and goals for their unit's patient population. Rapid-cycle change process was used to educate and reinforce the use of the plan of care as important and relevant to nursing's contribution to care. Process issues around documenting were reviewed and adjustments made to educational materials to clarify steps to be taken. Staff were added to the project every 3 days until the entire staff was included. Manual audits were completed weekdays on patients that were at least one day post-admission. There were two educational interventions: a Nursing Grand Rounds, and tips sheets.

Results

Success was measured as an increase in documentation on the plan of care as evidenced by the presence of the identified problems and associated measurable goals and a plan of care note daily. Initial audits performed in April 2017 demonstrated compliance with the plan of care at 23%. Post intervention audits show continued improvement with increased compliance to 93%.

Discussion/Conclusion

The use of an interdisciplinary plan of care allows all clinicians to see what the impact of each discipline's contribution to the patient's care is. With the evolution of EHR's the entire team has the capability of documenting and seeing all disciplines' assessments in one place with easy reference to support the progression toward the next level of care [1]. Enhancing staff's ability to utilize and document against the plan of care has the potential to improve staff satisfaction, patient satisfaction, and decrease duplication of efforts.

We believe this project was successful because end-user staff were involved and engaged from the beginning of the project. Their assessment of issues, identifying reasons for lack of use, and solutions to solve them, in the form of tipsheets, helped all see how they can impact change. Addressing concerns regarding how to use the product, in an efficient manner, early in simple terms with clear examples helped to make this project a success. Once the project started, the fear of this being a time consuming process dissipated. Ongoing work will begin to include patient engagement in this work as well.

References

1. Keenan, GM, Yakel, E, Tschannen, D, and Mandeville, M. Documentation and Nurse Care PLanning Process. In R. Hughes, & R. Hughes (Ed.), Patient Safety and Quality: An Evidence-Based Handbook for Nurses, Roickville, MD: Agency for Healthcare Research and Quality, 2008. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK2674.

Improving Change Management and System Optimization at a Small Community Hospital

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Keywords: Change Management, Process Change, System Optimization, Clinical Informatics

Introduction/Background

In August of 2017, the Clinical Informatics (CI) and Information Systems (IS) departments at Wentworth-Douglass Hospital identified a gap in the processes surrounding change management and system optimization for the hospital's electronic medical record. Identified gaps included lack of consistent documentation of requests, lack of consistency with the request approval process, and inconsistent communication to requestors. These gaps impacted end user satisfaction and delayed request turnaround time.

To improve efficiency of resources and service to end users, the facility moved from multiple module specific change management groups to a single application specific change committee. As part of the consolidation, significant work was done around standardizing processes, pooling resources, and breaking down silos between change management groups.[1]

Methods

Prior to the process change, a standardized work process was developed for change requests based on feedback from key stakeholders. The following new workflow was implemented:

- Consolidated four change control committees into one, single clinician driven committee;
- Developed clinical informatics governance to scale and prioritize large scale change requests and projects in a standardized format across all applications;
- Assigned a clinical informatics professional to each change request to steward it through the process;
- Developed a process to account for and track all methods of submission of change requests;
- Standardized tracking of change requests through the use of a ticket management system and standardized reports.

Utilizing the IS ticket management system, real-time data was collected, including the average age of outstanding requests, average time to resolve request, change status, request type, and age of ticket. To ensure data sharing and transparency, a biweekly dashboard of the data was presented to the committee. In addition, a retrospective review was performed for all change requests in the following states: 1) complete, 2) closed, 3) cancelled and 4) denied. The review was performed using data from the first three months of the process change and compared against data over the same period from the year prior.

Results

Upon comparison of the first three months of the new processes against the same three months of the previous year, the average time of resolution decreased by 44%. The average age of outstanding requests decreased from 145.6 days to 96.8 days. The Change Management Committee continues to successfully maintain an average age of outstanding requests at or below 100 days.

Discussion/Conclusion

The committee continues to identify areas for improvement, including developing a standardized and objective prioritization scoring tool to supplement decision making. In the future, the process improvements will be shared with other application specific change committees to align processes and eliminate inconsistencies between best of breed systems throughout the health system. The goal is to align the facility for a future enterprise wide system implementation.

References

1. Lorenzi, NM, Riley, RT. Managing Change: An Overview. Journal of the American Medical Informatics Association, 2000; 7-2; 116-124