Evaluation of the use of the Bar Code Medication Administration(BCMA) Process after the First Decade

Lynne Bittner, MS, RN-BC
Co-presenter: Anne Lara, RN, EdD

Abstract

Bar Coded Medication administration (BCMA) has been widely adopted in the United States, with more than 50% percent of acute care hospitals adopting the technology. The use of BCMA is intended to reduce medication errors, but some of the patient safety features of the technology may be reduced if end-user staff members employ workarounds. Our small community hospital is a 122 bed not-for-profit, full-service hospital. BCMA was implemented in our hospital in 2006, beginning in the Emergency Department (ED) as a pilot and subsequently implementing in the inpatient units. In 2014 our hospital underwent an EHR upgrade, expanding our use of BCMA and it is now live in the ED, the inpatient units, the Behavioral Health Unit, the Observation Unit, the Pre- and Post-Surgical Units, and the Infusion Center. Post Go Live reports from nursing services of inefficiencies encountered during BCMA led us to develop a survey to determine contributing factors. A literature search was performed to review existing surveys, many of which examined the transition from paper medication administration documentation to BCMA and were not appropriate for our purpose. We then developed a survey to assess multiple aspects of Medication Administration in a mature BCMA system. The survey consisted of five demographic questions followed by 20 questions with six response choices ranging from Strongly Agree to Strongly Disagree in a Likert Scale design. The study was approved in an expedited review by a university Institutional Review Board (IRB). The target population for the survey was a convenience sample of staff nurses and respiratory therapists who were identified from a list of staff members who had removed medications from the automated medication dispensing system in the previous six months. An email request containing the purpose of the study, an invitation to participate, a consent statement and a link to the survey was sent. Consent from participants was obtained when they accessed and completed the survey. The survey was open for three weeks. Of the 325 staff sent the link, 120 completed the survey, for a response rate of 37%. Survey findings revealed opportunities for improvement in the following areas: pharmacy workflow, medication delivery/administration processes, equipment availability/function, documentation on the medication administration record(MAR), and staff education. Results were shared with the organization executive team and action plans for addressing improvement opportunities were developed. Priority was given to those areas where patient safety was directly impacted.

Scheduled Medication Administration Times- "Giving Nurses the Gift of Time"

J. Vickie Elliott, BSN,CCRN-CSC
Co-presenter: Roxie Shortt-Lewis, BSN

Abstract

Our team utilized Lean/DMAIC tools to identify the reason nurses spend an excessive amount of time administering medications. Baseline data collection showed that a nurse spends 18 minutes per medication pass and 15% of all mediation passes are unnecessary. The average medical patient had 4.2 scheduled medication passes on day shift (SD= 2.48) and 2.1 medication passes on night shift (SD= 1.4). The Standard Medication Administration Time policy was revised and approved by the PNT committee. To facilitate pharmacy and nursing education, a learning packet was created to provide guidance on medication scheduling and rescheduling. Education began with department directors, managers and clinical supervisors and then expanded to nursing staff meetings and department meetings. As a result of this project, 90% of unnecessary medication passes were removed. In addition, 83% of unnecessary medication passes were removed from the hours of 2200-0600. Baseline data showed an average of 0.86 unnecessary medication passes per patient day. A calculation of savings utilizing an average census and the average nursing hourly wage resulted in a daily savings of $1,454 and an annual savings of $530,000.

Creation and Evaluation of a Preoperative Education Website for Hip and Knee Replacement Patients - A Pilot Study

L. Andrea French, JD, RN, MSN
Co-presenter: Amelia Dayucos, RN

Abstract

Problem Statement: The use of websites to provide patient education is becoming more common, but the usability and quality of the information must be evaluated and ensured. Because patients undergoing hip and/or knee replacements are usually older adults, this population may have more difficulty with the technology of online education. The benefits of a properly executed and effective preoperative patient educational intervention have been shown to result in improved psychological and physical well-being for patients undergoing surgery, leading to better outcomes. Web-based preoperative teaching can also better incorporate evidence-based research into this important aspect of patient education. The goals of this pilot study are to determine the usability and feasibility of a website created to increase patient engagement in their own preoperative education, assess their access to online education, and improve the quality of the education patients receive in preparation for hip or knee surgery. **Methods**: Following expedited IRB approval of this quality improvement project, the study team used a convenience sample of two patient cohorts from a Preoperative Ambulatory Surgery Services (P.A.S.S.) department of a medium-sized community hospital. One group received the usual care (education via paper form) and the other group received the paper documents plus a link to the website. The patients were directed to complete anonymous Survey Monkey surveys. The design of the website was intentionally made to be simple, with evidence-based "menu-driven" drop-downs and other features to make the screens age-appropriate to the patient population. The website content was supported with video and PDFs of pamphlets containing educational and illustrative topics, materials the same as or similar to the usual educational classes and paper documentation provided to patients by the P.A.S.S. nurses. There was an option for the patient to contact a P.A.S.S. nurse with questions, and the clinical study nurse would monitor the email daily, to ensure timely response. Links were provided on the education website for further information about the study and the Survey Monkey questionnaire. The team used the Perceived Health Website Usability Questionnaire (PHWSUQ) in drafting survey questions. A website header and both surveys provided for passive informed consent. The clinical nurse student researcher polled the P.A.S.S. nursing staff to obtain preliminary qualitative feasibility results. **Data Analysis and Results**: Descriptive statistics and paired t-tests were used for comparative analysis of the cohorts. We hypothesize that the findings will show that patients who received web-based education in addition to the printed materials will opine that they are more knowledgeable about their procedure, have less anxiety, and experience greater satisfaction with their preoperative education. We further expect to find that the website preserved the nurses' time and that there was some cost savings for the unit in using less supply chain allocations. **Significance:** If our hypotheses are supported, nurses will save time otherwise spent on education and may have more opportunity to identify clinical issues in patients preparing for knee and hip replacements. We hope to show that evidence-based online education is effective and feasible for this population.

Direct Messaging: Are We There Yet?

Oscar Glorioso, MSN
Co-presenter: Kristin Kammrath, MSN

Abstract

Problem Statement: BSWH implemented C-CDA as CMS requires all eligible hospitals participating in the Medicaid Electronic Health Record (EHR) Incentive Programs to use Direct Messaging technology in transmitting summary of care records when transitioning or referring patient care. **Methods**: *Planning and Analysis* 1) STEEEP Analytics Team provided subject matter expertise in MU regulations 2) CMIO and Clinical Informatics Team provided direction on what clinical data set will be part of the discrete information transmitted through Direct Messaging. *Designing and Building/Testing and Implementing*: 1) EHR Vendor provided BSWH a designated Direct address 2) IS EHR Clinical Documentation configured the C-CDA document 3) IS EHR Security Team configured internal and external addresses in EHR as well as provided access to resources involved with the Inbound and Outbound management of the Direct Messaging workflow 4) IS EHR Report Team developed the MU dashboard, reports and the integration with the provider network 5) IS EHR Education/Training Team delivered new clinician workflows *Evaluating /Maintenance/Supporting*: 1) STEEEP Analytics Team provided validation and ongoing monitoring for problems/issues and MU compliance 2) IS EHR Clinical Documentation Team provided ongoing monitoring of Direct Messaging transmissions 3) HIM-EMPI team match Inbound direct messages to an existing patient account 4) Enterprise Care Coordination team sends out Direct Messages to providers expecting Summary of Care 5) IS EHR Clinical Documentation and Security Teams maintain new/changed internal and external addresses in EHR; provide ongoing support to users with technical issues or new provider partners. **Results**: 1) C-CDA provided outpatient providers a snapshot of key information and the ability to assume care without combing through hundreds of pages of records. 2) Next providers of care were able to quickly identify patients in need of additional intervention to prevent readmissions and other issue.s 3) Providers depend less on faxed documents. 4) No direct benefit for inpatient physician because another health information exchange tool was introduced in their workflow (global viewer). 5) BSWH NTX Region successfully reported for MU1 and MU2. 6) At discharge, patient's summary of care (C-CDA) is available to view in Patient Portal. 7) Direct Messaging was used to send data to a health registry. **Significance**: CMS requires all eligible hospitals participating in the Medicaid Electronic Health Record (EHR) Incentive Programs to use Direct Messaging in transmitting summary of care records when transitioning or referring patient care. Beyond regulatory use, BSWH have leveraged this technology as a means to establish partnership with other healthcare organizations, improve patient care coordination, and benchmark care.

Clinician-Led Practice Design for Value-Based Reimbursement: The Oncology Care Model

Tamira Harris, PhD, MBA, MSN, CPHQ

Abstract

Learn how physician leaders and clinicians have changed care delivery within 12 practices encompassing over 400 sites and 800 physicians. Technological infrastructure, knowledge, and workflow processes have been redesigned to create improved patient and family experiences and to increase physician and staff satisfaction. This session explores a collaborative physician/executive network -led initiative focused on building a foundation for oncology practices to compete in the healthcare arena today. The session will cover building technological infrastructure for real-time accessand designing processes to meet regulatory guidelines while providing holistic, quality patient care. With so much emphasis on optimizing performance across the care continuum in the transition to value-based care, much work remains in the outpatient care settings. Given how new payment and care delivery models are dramatically effecting current office practices and patient populations, it is urgent to reshape our approaches to drive effective patient care and efficient office throughput. The Centers for Medicaid and Medicare (CMS) Innovation Center has developed a new care delivery and payment model, Oncology Care Model (OCM) designed to improve the effectiveness and efficiency of oncology care. The aim of the program is to provide higher quality and more highly coordinated oncology care at the same or lower cost to the Medicare program. Oncology physician practices have entered into payment arrangements that include financial incentives based on performance accountability for episodes of care surrounding chemotherapy administration to cancer patients. The session will describe methodology for network and practice level development of a team based care model for patient navigation and throughput. Based on leadership, measureable outcomes have included efforts for redesign of key workflows to improve quality of care, enhance efficiencies, and meet CMS guidelines, including full scale Patient Navigation Processes for optimized patient throughput. Additional outcomes include: standardized full scale holistic approaches to meet psychosocial needs including advanced care planning and survivorship programs, 24 hour support, real time technology and dashboards for patient tracking and needs assessments, and practice alignment with organizations and networks to support patient throughput and family needs outside of the office. US Oncology developed a continuous performance improvement program, new methodologies for billing, and standardized care using national guidelines across the network of US Oncology in multiple states and practices. The novel aspects of this presentation include that it is a physician-led initiative incorporating 1) Development of continuous performance improvement in the outpatient arena; 2) Workflow design incorporating cultural and clinical changes; 3) Standardizing care across both large and small scale practices with varying demographics for provision of clinical excellence to all; 4) Real time technological advances for proactive decision making. Adopting strategies described in this session, can help you guide successful change.

Practice Poster Award

Secure Messaging Application: A Heuristic Evaluation

Amy Hill, BSN, RN-BC, CPN
Co-presenter: Arpad Kelemen, PhD

Abstract

Increased availability and prolific use of smartphones and other mobile devices have the potential to render communications in health care settings much more efficient. Many mobile devices, however, may pose a security risk to health care information. Providers require a secure communication solution that maintains HIPAA protections and otherwise safeguards confidential information. Vendors offer mobile application software to allow for HIPAA-compliant, secure messaging within a hospital setting, but usability issues may interfere with the cliniccal workflow. Our aim was to evaluate the usability of one secure messaging mobile application, Akario Backline, for both clinical and non-clinical communications in an inpatient health care setting. Goals for this project were to assess the basic functionality of the mobile application and identify any usability failures using Jakob Nielson's 10 usability heuristics. Three clinical analysts of the implementation team were assigned to perform a heuristic evaluation on three different smart phones: IPhone 6, IPhone 6 plus, and Samsung Galaxy S5. A thirty-question heuristic evaluation was developed and given to the three analysts. Each analyst used all three smart phones and identified whether each device met the heuristic qualifications by responding to each criterion with Yes, No, or N/A, with the ability to add additional comments. If the response was No, the analyst indicated the severity of the failure on a 5-point scale. A response of 0 indicated “I don't agree this is a usability problem.” A response of 1 indicated a cosmetic problem only. A response of 2 indicated a minor usability problem; a response of 3, a major usability problem; and a response of 4, a usability catastrophe. Each device was evaluated independently by all three analysts, and the results were reported to the implementation team for analysis. Results were summarized in a combination of table and graph formats. Results showed that twenty-one characteristics evaluated on the 30-item questionnaire met heuristic qualifications, based on two out of three evaluators answering Yes; six characteristics did not meet qualifications (two or more analysts responded No); and three were marked as N/A. Out of the six items marked No, five were rated a minor usability problem (rating = 2) and one was rated as not being a problem (rating = 0). Overall, then, the secure messaging mobile application was found to be easy to use with very minor usability issues. The implementation team could take the results and work with the vendor to continue to improve the mobile application while moving forward with large scale implementation in the hospital.

Is it really Necessary? Using Clinical Decision Support to Decrease Urinary Catheter Device Days and Reduce CAUTI's

Jassette Johnson-Dawes, RN
Co-presenter: Rafiat Adedayo, RN

Abstract

Although EMRs have been used for several decades in acute care hospital settings, only recently have clinical decision support (CDS) tools matured enough to contribute significantly to patient safety and quality outcomes. A 2014 study concluded that catheter-associated urinary tract infection (CAUTI) was the most common device-associated infection in the United States, with 69% considered avoidable. This frequency occurred despite a 2008 Centers for Medicare & Medicaid Services initiative to reduce the incidence of CAUTI by 25%. Grounded on evidence-based best practice, Northwell Health, an integrated healthcare delivery system in New York, developed and implemented a CAUTI electronic documentation 'bundle' in July 2016. This was designed to alert clinicians to assess the necessity of urinary catheter use and to provide reminders for proper catheter care. CAUTI rates and catheter device days were collected prior to implementation of the EMR documentation 'bundle' and compared to the rates and days post implementation. Results thus far, 6 months after implementation, indicate a significant reduction in urinary catheter device days across multiple hospitals. These findings have accelerated an enterprise program to re-educate staff on evidence-based care for patients with urinary catheters.

Patient Risk Stratification via NEWS: Speaking the Same Language

Marie Kozel, MBA, BSN

Abstract

Early detection, timeliness, and appropriate clinical interventions are all related to improved outcomes in patients who present with acute illness or who are already in acute care and experience deterioration in condition. In an effort to identify and proactively intervene for patients most at risk for deterioration during the acute care encounter, evidence exists to support the use of 'early warning scores' (EWS). A variety of EWS tools exists, each routinely scoring patient risk using physiologic parameters typically collected and monitored by nursing staff during acute care visits. Each tool additionally defines a score that represents the urgency and type of clinical response required. Our facility had no risk tool in place. While planning to implement such a risk stratification tool, the research efforts of a clinical team discovered the National Early Warning Score (NEWS) tool. This tool was developed for use in the United Kingdom by a task force recommendation from the Royal College of Physicians. The tool, published in 2012 and updated in 2015, allows standardized and routine clinical assessment of all adult patients over age 16 using a minimum set of physiologic parameters. This tool advocates standardization in risk scoring across all patient types (excluding pediatrics and obstetrics) using six physiologic parameters, as well as standardization of interventions based upon risk level. Implementation of the NEWS tool in an automated fashion directly in the Electronic Medical Record (EMR) includes presentation of alerts when the patient risk score reaches certain levels, visibility of the parameters that contributing to the score, and the ability to record the interventions put into place or to automate a Rapid Response Team call. The implementation has allowed an evidenced based, standardized early warning risk stratification scoring tool for our organization that has resulted in: 1) Implementation of a tool not previously in place; 2) Improved surveillance of unplanned transfers to the ICU; 3) Improved surveillance of Code Blue calls outside of the ICU; 4) Improved surveillance in the use of Rapid Response Teams for early intervention. Additionally staff can view the patient risk score in a variety of areas in the EMR to observe trends and share the information during staff/shift handoff to further impact patient safety via patient-generated data that contributes to clinical decision making

Does DNP Students' Experience with Information Technology Predict Mastery of Informatics Competencies?

Barbara Kupferschmid, PhD, MSN, RN
Co-presenters: Connie Creech, EdD, MSN, RN, ANP-BC; and Marsha Lesley, PhD, MLIS, BSN

Abstract

Problem Statement: Use of information technology to assist and guide nursing practice has increased in recent years, especially since the adoption of the Health Information Technology for Economic and Clinical Health (HITECH) Act. Students enter the Doctor of Nursing Practice (DNP) program with varying levels of informatics experience and different entrance education requirements including post-Baccalaureate and post-Masters degrees. Thus students can enter programs with differing needs related to their experience and educational backgrounds. Understanding students' previous experience would assist the faculty to tailor informatics course content to meet varying student needs. The aim of this study was to evaluate DNP students' prior experience with information technology and to assess whether that experience predicted their ability to master informatics competencies. **Methods**: A retrospective descriptive design was used with a convenience sample of students enrolled in an online informatics course. Data collected included students' self-assessment of experience with information technology, demographic characteristics, and faculty determination of students' mastery of competencies designed to test Informatics knowledge and skills. Students rated their experience with Meaningful Use, utilization of datasets and databases, clinical support systems, and e-Health. Values based on competency scores were assigned as follows: 1 (mastered), 2 (competent), or 3 (did not master). Students' self-assessments of informatics experience in relation to competency mastery were compared using Pearson Chi-Square. Logistic regression was performed to assess the impact of experience and highest degree obtained on competency mastery. P-values less than 0.05 were considered statistically significant. The Institutional Review Board designated the study as exempt. **Results**: Students held BSN degrees (n=44) or MSN degrees (n=11). 91% were female and 9% were male. Students were in the Family Nurse Practitioner (34.5%), Adult Geriatric Acute Care (20%), Psychiatric (14.5%), and Adult Geriatric Primary Care (18.2%) tracks. Analysis revealed that a greater percentage of students with experience in Meaningful Use (MU) (75.9%) mastered the competency focused on an analysis of MU compared to students without experience (38.5%) (p=.004). The strongest predictor for mastering the MU competency was experience (p = .001), after controlling for highest degree obtained. Experience with datasets did not predict mastery of a competency focused on working with spreadsheets (55.6% vs. 67.9%) (p=.059) or databases (81.5% vs. 82.1%) (p=.16). A greater percentage of students with experience in e-health (75.7%) mastered the competency focused on application of e-health resources to the learning needs of a vulnerable patient compared to students without experience (33.3 %) (p=.02). While more students with experience in clinical support systems (83.3%) mastered a competency focused on an application and analysis of clinical support systems in comparison to those without experience (67.7%), the test was not statistically significant. **Significance**: In some areas where students had prior experience with information technology, students were more likely to master competencies focused on those areas. Informatics course content may need to be designed so that students can choose content that reflects their needs based on their experience level. Faculty should consider tailoring the course modules for novice and experienced learners to improve mastery of informatics competencies.

Medications, Barcodes, and Apps - Oh My!! Implementing BCMA in a Pediatric Facility with a Hand-held Communication Device

Stephanie Lenz-Norman, MSN, RN

Abstract

Nursing is a field of nurture and healing. Nevertheless, even with the best education, skill, and intention, nurses still make errors that harm patients. Errors involving medications can result in extended hospital stays, cause permanent injury, and attribute to death. In fact, over 7,000 of the reported preventable adverse drug events in 2012 resulted in patient death . Nurses are at the sharp end of the medication delivery process, and are often the last barrier to prevent medication errors. However, one estimate suggests that nurses are the cause of over 64% of medication errors . Various technologies have been offered to decrease these medication errors, but the application of these technologies has produced mixed results. Much research has been done to evaluate the effectiveness of Bar-Code Medication Administration (BCMA) on decreasing medication administration errors. Research has investigated nursing work-arounds related to BCMA, but fewer studies have assessed BCMA's impact on nursing workflow. This presentation will provide an overview of implementing BCMA with the use of a hand-held communication device via a mobile application in a pediatric teaching hospital. The project team did much to prevent known work-arounds, including implementing a unique bar-code for the patient armband and evaluating bar-code scanner devices for visibility of BCMA alert screens. Ultimately, the use of the RN's mobile communication device, which has an embedded bar-code reader, was selected for scanning medications for BCMA. The mobile and app technology related to BCMA is not well studied and has unique benefits and risks associated with its implementation. This presentation will be aimed at giving an overview of this complex project and discuss benefits and lessons learned from the project implementation.

Best Practice: Care Alerts in Maryland's Health Information Exchange, Chesapeake Regional Information System for our Patients (CRISP)

Heather McAuliffe, BSN, RN-BC
Co-presenter: Rosella Ganoudis, MSN, MBA, RN

Abstract

Background and Aim: The Health Services Cost Review Commission (2016) has recommended working with CRISP to "exchange information regarding care coordination resources aimed at reducing duplication of resources, ensuring more person-centered approaches, and bringing additional information to the point of care." To address this initiative we worked with CRISP to implement care alerts. CRISP (2016) describes care alerts as two to three sentences that are "high priority care coordination information meant for the most complex patients who frequent hospitals and practices. Action-oriented, 'need to know' information that informs decision making and could assist in the prevention of unnecessary admissions and duplicated procedures." CRISP offered flexibility in how care coordinators and providers would receive the care alert information that would display on their site. This allowed us to define the best way for us to send them the information. This presentation outlines that approach. **Method**: Our requirements were for an easy to use, readily accessible documentation method. We desired a straightforward approach, utilizing processes already in place to promote a smooth implementation and increase the likelihood of success. Using existing documentation contained within the Continuity of Care Document, discharge routine, or other care management documents was considered, but ultimately rejected due to additional interface costs and the cumbersome process of isolating the pertinent information. After collaborating with CRISP, a physician champion, and our care management team we created two separate document templates for care manager and physician content. A change was needed to make the care managers' workflow similar to the providers' so that all care alert documents would file in the same location. This meant we could leverage our existing interface that sends transcription reports to CRISP. They could then use the report type value we provide in the message to identify the care alert messages and pull the text to display as care alerts in CRISP. After 3 weeks of defining requirements, developing templates, testing, and demonstrating success CRISP has used our experiences to formulate a best practice approach to care alerts for hospitals using the same EMR. **Lessons Learned**: 1) Leverage existing processes; 2) Create a process that is not burdensome to end users; 3) Focus on requirements. Keeping the purpose of care alerts in mind became increasingly important. We found the content could easily grow as we expanded to a wider group of users. **Implications**: Care alerts have the potential to be a valuable tool in addressing readmissions for high utilization patients and could have a positive impact on our patients. Future opportunities include expanding usage to primary physicians and hospitalists, and increasing the patient population beyond high utilizers. CRISP also has the ability to house more comprehensive documentation such as care plans, for which we can utilize this same process.

Optimization of a Sepsis Screening System

Patricia McCabe, DNP, RN, CCRN
Co-presenter: Janet Thorne, RN, MGR

Abstract

Evidenced-based clinical guidelines and new technology can promote meaningful use and improve the quality, safety, and efficiency of patient care. To this end, our team developed an electronic sepsis screening tool and process based on the Surviving Sepsis Campaign's (SSC) International Guidelines for the Management of Patients with Severe Sepsis and Septic Shock. To measure the usability of the sepsis tool and process, compliance with SSC guidelines, and the impact on hospital sepsis rates and mortality, we employed a quantitative correlative study using a survey methodology. The Systems Usability Scale (SUS) survey yielded a usability score for the tool and process of 61.54. Suboptimal usability of the tool and process can be expected to have negative effects on efficiency and patient outcomes. Aggregate quantitative data were collected and analyzed. The aggregated data included 1) response rate of the Rapid Response Team (RRT) to alerts; 2) number of Medical Doctor (MD) Order Sets initiated; 3) number of lactates drawn; and 4) hospital sepsis mortality rates. The aggregated data suggest that patients with an RRT response to their alert have increased number of lactates drawn and MD Sepsis Order Sets initiated. Three months of analyzed data showed a decrease in hospital sepsis mortality rates from 16.27 to 15.6%. A Pearson product-moment correlation coefficient was computed to assess the relationships among hospital sepsis mortality rates, the number of sepsis alerts responded to by the RRT, the number of lactates drawn, and the number of MD protocols implemented. There was a perfect correlation between the number of sepsis alerts responded to by the RRT and lactates drawn [r=1.000]. The number of sepsis alerts responded to by the RRT had a positive correlation [r=.791] with MD protocols ordered and a negative correlation [r= -.950] with the hospital sepsis mortality rate. Using a dedicated team to respond to sepsis alerts immediately and using the Registered Nurse (RN) and MD order sets may decrease sepsis mortality rates. However, more data are needed to assess patient outcomes related to the use of the SSC guidelines.

Patient Progression: A Multi-Discinplinary Approach to Moving Patients Safely, Quickly, and Efficiently

Nancia Odom, RN, MSN, BC

Abstract

Background: Duke Regional Hospital (DRH), a part of the Duke University Health System, is an acute care community hospital with 369 licensed beds located in Durham, NC. In 2016 DRH's board of trustees set a strategic priority for fiscal year 2017: to lead in the delivery of highest-quality, patient centered care. **Objectives**: The specific goal for this strategic priority was to improve the emergency department (ED) length of stay for admitted patients. This is to be accomplished by improving patient progression. High ED lengths of stay and ED crowding can negatively impact patient care, patient satisfaction, and patients' leaving without being seen by a medical provider. DRH's goal with improving patient progression was to provide safe, efficient and timely movement of patients from admission to discharge. Our additional goal was to decrease patient wait times at transition points. **Methods**: DRH used a multi-disciplinary approach to improve patient progression. Hospital staff in multiple departments across various disciplines impact the moving of patients during an admission, including Care Management, Environmental Services, and physicians. Our team also included the hospital president and vice-president of operations. We spent several months completing a deep dive into process flow and understanding the barriers to patient throughput at our facility, to achieve a true understanding of all issues. Once issues were identified, our team further divided into four workgroups, each with a specific list of action items to complete. Through our deep dive into the barriers, the action items were noted to be, if completed, the most impactful to improving the hospital's patient progression. The four work groups were: Clinical Staffing; Discharge Process; General Medicine; and Data. **Results**:Some of our results include 1) the creation of a General Medicine unit incorporating our teaching service patients, clinical nurses, and providers; 2) the completion of an Admission and Discharge nurse pilot; and most notably, 3) a 50% reduction in the number of patients waiting greater than 240 minutes (4 hours) for an inpatient bed. Other results include a hospital-wide, unit-level based dashboard that notes metrics and performance over time, redesigned patient throughput processes, and improved communication among multiple disciplines. In addition, the ED length of stay for admitted patients has decreased by 10% since the beginning of the fiscal year. Throughout the length of the project, a core team meets bi-weekly to review metrics and discuss any safety issues with throughput. Issues are also escalated in real time to management for immediate resolution to best meet the needs of the patient. **Significance**: A strategic, multi-disciplinary approach with ongoing leadership oversight and data review is critical to improving patient progression to move patients safely, efficiently and quickly through a healthcare facility.

Care Team Communication: Enhancing the delivery and collaboration of patient care with a mobile technology

Cindy Phipps, BSN, RN
Co-presenter: Millicent Johnson, MSN, RN

Abstract

Objective: The Care Team Communication (CTC) project is designed to improve patient-nurse communication, reduce response times to patient call lights, and improve communication between care team members. Communication modalities included the nurse call system (NCS), the ADT system, and smartphone technology. The mobile application on the smartphone is used as the point of integration and provides a HIPAA-compliant platform for secure texting, direct calling, and broadcast messaging. It also provides a hospital directory to facilitate communication with other application users and ancillary departments. These features are designed to enhance the efficiency and effectiveness of patient care. **Method/Implementation**: Using a phased approach, implementations began in October 2016 and were completed in January 2017 in a 700-bed magnet-designated academic medical center adult hospital. Using a hybrid of the super user (SU) model (i.e. not out of staffing), end-user training consisted of instructor-led SU classes and web-based learning modules. Completion of the modules was required for all clinical staff and the one-hour instructor-led sessions, required for all SUs, was optional for all other staff. Initial login sessions on the shared mobile devices were conducted with each staff member prior to implementation to ensure they had appropriate access in the system. A brief hands-on demonstration of the application's functionality to reinforce education and answer users' questions was included. Patients were provided with verbal and written information about the use of the smartphone and its purposes in supporting communication. During the first phase of the implementation, SSS representatives along with unit SUs provided at-the-elbow support and identified workflow and technical issues. Phase two of the implementation includes provider adoption of the technology for CTC. Providers will download a version of the application onto their personal devices. **Results**: A total of thirty adult units were implemented. Nurses have reported greater satisfaction with this new communication tool. It has also improved responsiveness to patient needs and patient satisfaction. However, some staff members changed phone settings, with negative effects on application functionality, call quality, and connectivity. In addition, the CTC application was unable to interface with some other communication systems, requiring some nursing groups to carry multiple devices. Other unanticipated issues with CTC application functionality resulted from inadequate training for the new NCS. **Conclusion**: CTC has overall been a great success. Patient safety and satisfaction data are pending but will be reported during the presentation. We have learned some valuable lessons through this implementation. For example, the impact of the new NCS may have been underestimated. The implementations of both the new NCS and the CTC mobile application may have been too close in time, creating a burden on staff to adequately learn both systems. Consequently, these issues highlighted where additional educational efforts should be focused for future planned implementations of these two complementary systems.

Research Poster Award

What factors predict Fitbit adherence in Stroke and Parkinson disease?

Katrina Schrader, MA
Co-presenters: Helena Mentis, PhD; Michael Phipps, MD; Ann Gruber-Baldini, PhD; Karen Yarbrough, DNP; Erik Barr, BA; Rainer von Coelln, MD; and Lisa Shulman, MD

Abstract

Objective: To investigate predictors of adherence to wearing the Fitbit activity monitor in patients with Parkinson disease (PD) and stroke. **Background**: Exercise and activity improve symptoms of PD and stroke and aid in primary and secondary stroke prevention. However, adherence to physical activity programs is low and little is known about adherence to daily activity monitoring. **Methods**: Patients (n=19, age=58.8+/-11, range 37-83Y) with PD (n=12) and stroke (n=8) participated in a pilot study to investigate feasibility of and adherence to Fitbit monitoring to track activity between clinical office visits. **Results**: Comparing PD and stroke, PD patients were more disabled (Rankin; p= .004) but more likely to be employed (p= .03). Stroke patients were more depressed (PROMIS; p=.045), more cognitively impaired (MoCA; p=.02) and had lower numeracy (Subjective Numeracy Scale; p=.03). Fitbit data were collected for 28-53 days (mean=32.9). Patients used the Fitbit for 86% of days and 13.5 hours/day on average. Average steps/day were 6041+/-2797. The only significant predictor of adherence to the Fitbit (% of days used) was medical co-morbidity (r=-.46, p=.047) such that those with greater comorbidity (Cumulative Illness Rating Scale) wore the Fitbit less. Other high correlations with adherence (but nonsignificant) were: PROMIS Self-Efficacy for Managing Medications (r=.57), Self-Efficacy for Managing Social Interactions (r=.46), greater e-Health Literacy (eHEALs; r=.39), and less pain (r=-.37). Adherence showed low correlation (r<.2) with disease severity, disability, cognition, depression, age, and socioeconomic status**. Conclusions**: The strongest predictor of adherence to daily activity monitoring was level of medical co-morbidity. Other determinants of adherence were self-efficacy for managing conditions, e-Health literacy and pain. Age and level of disability did not affect daily use of small wireless monitors to track activity in stroke and PD.

Toward High-Quality Big Data to Support Population Health: Identifying the Data Quality Problems with Medicaid Datasets

Yili Zhang, MS
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Abstract

Problem Statement: Big data analytics hold tremendous potentials to improve health outcomes at the population level by improving care delivery at a reduced cost. However, data quality problems are commonly encountered in research studies leveraging big data. A lack of data quality can result in imprecise, useless, or even misleading results, which detract from the quality of reports produced and decisions made to improve population health. Therefore, it becomes important to develop strategies to help improve the quality of big data in an effective and efficient manner. For this purpose, the investigation, classification and identification of the "data defects" is a necessary first step. Data defect refers to a discrepancy between the actual and expected values held by a data item that requires a corrective change. In this study, we focused on the first step to improve the quality of data stored in the Provider and Procedure Subsystems of a Medicaid Management Information Systems (MMIS). More specifically, we classified and detected the data defects in these MMIS subsystems. **Methods**: The datasets subject to defect detection consist of eleven tables for the Provider Subsystem with more than 1.5 million records, and eight tables for the Procedure Subsystem with more than 700 thousand records. The methodical steps involved reviewing all of the data-related documents, performing a descriptive analysis to better understand the data, conducting a literature review to define a taxonomy of data defects, and developing a data quality toolkit (DQT) to detect the data defects automatically and efficiently. **Results**: The taxonomy for data defects includes four major categories: Syntax violation, semantic violation, missing data, and duplicate data. These major categories are further divided into twelve subcategories. For this defect taxonomy, DQT detected more than three million data defects in the MMIS data. Fifty-nine percent of the data defects fall in to the syntax violation category and thirty-six percent of data defects fall in to the missing-data category. Most of the syntax violation defects were about the invalid values of certain Medicaid codes in the MMIS data, and the semantic violations mostly occurred due to the presence of invalid dates in the dataset. Defects related to invalid syntax should be the focus of future initiatives for data quality improvement. **Significance**: Medicaid data, a type of big data, have been utilized in various healthcare applications and population health analytics for various purposes. Examples of foci include improving the quality of myocardial infarction care, improving prescription drugs outcomes, providing a resource for epidemiologic studies, and estimating the prevalence and medical care costs for various diseases. However, substantial problems with the quality of the existing MMIS data reduce their usefulness for population health analytics purposes. Thus, effective data maintenance and cleaning become crucial to improve the quality and utility of the Medicaid data. So far, there has been no study which created a taxonomy of defects for the MMIS data and detected the data defects automatically. This research takes the first step to make the big Medicaid data an even more useful resource in population health decision making