



Summer Institute in Nursing Informatics 2019
Poster Presentation

Assessment of Knowledge Regarding Prevention of Hepatitis B infection Among African Undergraduate Students of Health Sciences in Davangere, Karnataka-India

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BACKGROUND: Hepatitis B is an inflammatory disease of the liver which is caused by Hepatitis B Virus. It is a global problem, with 66% of all the population living in areas where there are high levels of infections. Hepatitis B infection may be due to lapses in the sterilization of instruments as well as improper waste management. Knowledge regarding Hepatitis B and safety precautions is needed to minimize the health care setting's acquired infections among health personnel and students of health Sciences.

OBJECTIVES: (a) To assess the knowledge regarding Hepatitis B among African Students of Health Sciences (b) To associate the knowledge of the students regarding Hepatitis B with their selected demographic variables.

MATERIAL & METHOD: Research Design: A descriptive cross sectional design was used for the study. Sample Size and Sampling Technique: Fifty (50) students were selected using purposive sampling. Tool of Data Collection: A validated structured questionnaire was used for data collection. The data collected were organized, tabulated and analysed using descriptive and inferential statistics. Ethical Clearance: The researcher had taken a written permission from the Students Hostels managers to conduct the research study. Consent was taken from the subjects before data collection. The subjects were informed that the confidentiality of data will be maintained.

RESULT: The results indicated that majority (52%) of the respondents are 22-24years of age. The students of B. Pharm were 25 (50%) 38% MBBS and 12% B.Sc. Nursing and 60% of them all are in their 3rd year of study. The overall mean score on knowledge regarding hepatitis B Prevention was 15.74 with maximum score of 29. The association between the knowledge of hepatitis B prevention with some selected variables shows that the program and the year of study were very Significant.

CONCLUSION: - The study was conducted among African Students of Health Sciences in order to assess their knowledge regarding Hepatitis B infection. After the completion of the study it is revealed that the knowledge of Hepatitis B prevention among the students was inadequate hence, recommends a similar study on a larger scale. **Keywords:** Assessment; Knowledge; Prevention; Hepatitis B; Infection.



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Evaluation and improvement of the Data Quality Toolkit: Supporting Collaborative Data Quality Improvement in Healthcare Organizations

Urmita Banerjee; Yili Zhang, PhD; and Gunes Koru, PhD

Introduction: Data quality problems, which are prevalent in healthcare organizations, often prevent data analytics efforts from reaching their full potentials. Data Quality Toolkit (DQT) is a multi-user client-server software application which supports collaborative data quality improvement involving healthcare professionals with different roles, background, and knowledge. Following the development of DQT in our lab, it was essential to evaluate its effectiveness in a real setting and further improve it before its pilot implementation in a state health agency. Accordingly, this research had three objectives: 1) Evaluating the perceived usefulness of DQT and identifying directions for improvement, 2) Evaluating the perceived ease of use of DQT and identifying directions for improvement, and 3) Improving DQT according to the identified directions. **Methods:** This study adopted a qualitative approach to obtain rich contextual data for evaluation and improvement of DQT. The opinions, suggestions, and experiences related to working with DQT in terms of its usefulness and usability were collected through focus groups conducted with graduate student participants. Focus groups allowed eliciting both individual expressions and group perspectives. Prior to focus groups, the participants used DQT and conducted month-long data quality improvement projects in the tool within their assigned groups by detecting defects, tracking them and resolving them. Each group worked on a different simulated home care readmission dataset injected with data defects. The focus groups were audio recorded and notes were taken. The transcripts of the recordings were produced and analyzed by using the Framework method along with the notes. To ensure the validity of evidence, triangulation was performed by collecting and analyzing information provided through direct opinions submitted by groups in a report. According to analysis results, DQT was improved by introducing new features and fixing the programming errors. **Results:** Capabilities of DQT such as establishing and managing metadata about business rules that apply to healthcare data as constraints, efficient and fast defect detection and data and business rule versioning were perceived to be useful. Suggested improvements centered around strengthening communication and collaborative work. The participants mentioned a need to enter metadata describing the original data and be able to track user, data and constraints inter dependency in finding defects. Regarding usability, accurate defect detection reports and the ease of operation in identifying different defect kinds in the dataset was perceived to improve ease of use. For usability improvement, simplifying task navigation and layout and increasing the overall intuitiveness and appeal of the interface were suggested. Accordingly, the interfaces were improved to address the usability issues, and new features were introduced to DQT that allow viewing dependencies on other team members over the data elements and constraints and enable maintaining a data dictionary. **Conclusion:** This research demonstrated that the participants were indeed able to use DQT for collaborative data quality improvement, which is highly promising. Their feedback helped improve the usefulness and usability of DQT. As the next step, we plan to implement DQT as a pilot in the state health agency for further improvements and refinements.



Summer Institute in Nursing Informatics 2019
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Integrating Informatics Content in Nursing Education

Lisa AnneBove, DNP, RN - BC

In order to provide quality care today, nurses need informatics competencies including the ability to use technology to document and assess care, gather and analyze data, trend patient outcomes across visits, anticipate general patient needs for preventative care, participate in telemedicine and methods to help patients engage in their own care. Both the National League for Nurses (NLN) and the American Association of Colleges of Nursing (AACN) recognize the need to prepare a workforce that demonstrates informatics competencies. The NLN vision focuses on the need to reframe how nursing students are taught so they can leverage connect health, social medical and other forms of technology to advance the health of the nation. To meet the AACN Essential of Informatics and Healthcare Technology, graduates of accredited programs need to demonstrate skills using and evaluating outcome data using current technologies, des; using information systems/technology to support and improve overall healthcare systems, and provide leadership in the evaluation and resolution of ethical and legal issues within healthcare systems related to technologies. In order to have a workforce that demonstrates these competencies, informatics needs to be integrated into nursing curriculum. Questions to determine how informatics education has evolved to meet the NLN Vision and AACN Essential and prepare a workforce that demonstrates informatics competencies include: 1. to what extent do nursing programs require informatics courses, 2. when an informatics course is required, is it a nursing or general course, and 3. when an informatics course is not required, how is informatics content included in the curriculum? Using the 2018 US News and World Report's top online schools in the United States, a review of the curriculum of RN to BSN, Masters and Doctorate programs in Nursing for informatics courses and competencies was completed. Each program was reviewed for informatics courses in the curriculum. Course descriptions were examined for informatics competencies and whether they were offered within the school or college of nursing. The purpose of this presentation is to report on the status of informatics content in nursing curriculum and discuss barriers to integrating informatics content, as well as impacts to the workforce.



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Poster Presentation

Providing consistent and accurate patient education across inpatient and outpatient clinic locations

Jennifer Brooks, RN; Ericka Sapp, RN; Valeria Johnson-Boccia, RN; Leslie Smith, RN, AOCNS, APRN-CNS; Erica Jaworski, BSN, RN; Stephanie Wildridge, BSN, RN; and Rosemary Miller, MSN, BSN, RN

Patients undergoing a radical prostatectomy have many educational needs, and their care is provided across inpatient and outpatient locations within the hospital. This has created challenges in communication required for smooth transitions between locations of care. During the initial outpatient visit, patients are presented with options of care, an overview of the procedure, and an informational packet. Inpatients receive information regarding urinary catheter care, discharge medications, and post-surgical care. After discharge, the outpatient clinic performs a voiding trial. Throughout this process knowledge deficits identified include: when and how to take discharge medications, insufficient knowledge regarding the voiding trial, and how to manage post-operative complications such as scrotal edema. Solutions implemented to address these knowledge deficits were multi-modal. A primary nurse from the clinic was designated in the Electronic Health Record; a practice that was not previously done for this procedure. The primary nurse would then utilize secure health messaging to remind the patient of their appointments and provide or reinforce instructions. The primary nurse also served as a point of contact for patient questions and concerns. The secure health messaging created a document in the Electronic Health Record visible to all caregivers across all locations. Other adaptations included providing the patient with a "daily goals" sheet to provide them with expectations of care from admission until they are seen at their outpatient clinic appointment. The daily goals tool is posted in the patient room to assist nursing staff and patients with a standardized method of providing care and education elements at prescribed time points during the convalescence period. Documentation changes in the Electronic Health Record included adaptations to the patient education note to include more of the education needs of the post-prostatectomy patient. These changes allow for easier identification of documentation and a systematic and standardized urology specific pathway for providing patient education by inpatient and outpatient nursing staff. Altogether, these measures serve to increase patient satisfaction, knowledge, and engagement.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Music Therapy in the ICU

DanielCastro, BSN

Explain the impact of music therapy in decreasing heart rate and respiratory rate prior to extubation. Imagine waking up restrained to a bed Breathing through a straw You hear the sound of beeps and strange voices in the hall Your heart starts racing Your respirations increase Your blood pressure rises You wonder if you are deceased. This experience was described by patients to nurse residents during the extubation trial. The purpose was to determine if music therapy with patient's preferred genre prior to the extubation trial was effective in decreasing anxiety allowing for decreased use of analgesics and anxiolytics. The Johns Hopkins Evidence Based Practice Model was utilized for the EBP process. The practice question was, "In mechanically ventilated patients whose anxiety and pain can be managed through non-pharmacological methods, does music therapy with the patient's preferred genre, compared to no music therapy and current practice of using analgesics and anxiolytics, impact the patient's ability to pass the extubation trial and decrease anxiety?" The evidence concluded music therapy for is effective, however, there needs to be more research correlating use of the patient's preferred genre. Vital signs were collected before, during, and after playing the preferred music. Data was collected on five patients. There was an average 11.6% decrease in heart rate and 14.8% decrease in respiratory rate during music therapy. There was an average 13.4% increase in heart rate and a 13.6% increase in respiratory rate when music therapy was discontinued. Music therapy will be expanded to all intubated patients meeting the established criteria to increase the sample size for further study. Additional metrics utilizing an anxiety scale, length of intubation, and patient satisfaction before and after music therapy will be included. Once statistical significance is determined, funding for devices, a music account, and headphones will be pursued.



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Database design, game development, step counter evaluations, and integration for hematopoietic stem cell transplant patients

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Fatigue is a commonly reported symptom for cancer patients receiving a hematopoietic stem cell transplant. PA has been shown to decrease fatigue in this population. Unfortunately, adherence to recommended levels of PA is low in cancer patients. A physical activity mobile app called "Walking Warrior" was designed and developed for this patient population. The use of mobile device apps promoting fitness may be helpful in increasing PA. WW is prototyped and upgraded before public release. Specific Aims: 1) Ideate, Design, and Develop WW game; 2) Design and develop a secure online MySQL relational database for gameplay and walking performance tracking; 3) Open-source step counter testing and modification; 4) Game evaluation, upgrades and bug fixes; 5) Develop secure communication software among WW, step counter, and database; 6) Obtain Institutional Review Board (IRB) approvals from Johns Hopkins University and University of Maryland; 7) Determine usability of WW with a patient sample. Methods: WW game development: We designed, coded and prototyped a puzzle game in Javascript to entertain and educate patients about their condition which is playable on any modern browser. Database development: We developed MySQL relational database and stored it on a server. Authorized users can view database fields including userID, user name, tokens available to play more, total steps taken, account created date and time, last record updated date and time, total game score, and highest game level played. The database was tested and was determined that it works properly. Step counter testing: Twelve nursing informatics professionals tested 4 open source step counter software and provided qualitative and quantitative reports. Aggregated responses are considered for software selection Code was modified for patient use. Game upgrades and bug fixes: Nineteen nursing informatics professionals tested the WW game and provided qualitative reports on recommendations for improvement including perception on appropriate difficulty levels, perception on usability, and itemized bugs reports. Three programmers make corrections based on recommendations. Secure communication software among WW, step counter and database was completed. IRB approval was obtained from JHU and is pending with UMB. Twenty patients will play the game that will prompt them to walk and earn tokens to allow them additional game play. We will collect their game play and walking performance on the server. At the end of the study, patients will fill a usability survey about WW. Significance: Having an online database that is seamlessly integrated with a mobile health game and step counter allows future data collection that can be used for research on physical activity in the population of users. Integration of a step counter with WW is vital because it is the tool that tracks the user's physical activity. Our current efforts further improve game design and usability to better meet the needs of the HSCT patient population.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Heuristic Evaluation Of A Diabetes Management Mobile App

ConcepcionChavez, BSN, RN

Objectives: The goal was to test a diabetic self-management app on smartphones by using Jakob Nielsen's (1995) 10 usability heuristics. This data can then be used for providers to incorporate a diabetic self-management app into their practice as an adjunct so that patients can achieve the desired outcome.

Methods: Two sample groups were chosen, iPhones and Androids. The materials used consisted of, instructions, patient scenario with nine tasks, and a heuristic evaluation (HE) form that had three questions to each of the 10 heuristics principles, making a total of 30 questions. Three evaluators completed the task and all three used iPhones, 6S Plus, 5S, and 6S. The evaluators were asked to read a patient scenario and then complete nine tasks. The evaluators then answered all 30 questions by giving an answer of Yes, No, or not applicable (N/A) to each item. If the answer was a "No", the evaluators were asked to give the item a severity rating number by using the Jakob Nielsen's (1995) severity rating scale from a 0 (0= I don't agree that this is a usability problem at all) to 4 (4= Usability catastrophe: imperative to fix this before product can be released).

Results: Three evaluators answered a total of 30 questions independently. Fifteen (50%) out of the 30 items met heuristic usability, 13 (43%) did not meet heuristic usability, and 2 (7%) items were reported as N/A. The median severity rating number was a 3 (3= Major usability problem: important to fix, so should be given high priority). The evaluators were given the opportunity to give comments to all the items, specifically to the ones that did not meet HE. Overall sixteen comments were reviewed, seven comments were directed to the items that met heuristics, eight comments were directed to the items that failed heuristics, and one comment was directed to the N/A item.

Conclusion: A Heuristic evaluation is a method used to find problems by using the 10 heuristics usability principles before an application can be released (Nielsen, How to Conduct a Heuristic Evaluation, 1995). The goal of the project was to perform a heuristic evaluation on Glucose Buddy to determine if the app was the best mobile healthcare app for patients with diabetes. Overall, the heuristics results did not correlate with the app's 4.8 star rating. Forty-three percent of the HE items failed with one item in the Error Prevention heuristic having the highest severity rating. In addition, heuristic 5-Error prevention failed all three HE items by all three iPhone users. There is a vast number of diabetes mobile apps with multiple functions available for patients to choose from. It is imperative that providers and patients have a clear communication on what the end goal is and what mobile healthcare app will be best suitable for the outcome.

Keywords: Heuristic usability; health mobile application; usability evaluation; diabetes health mobile app



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Poster Presentation



Practice Poster Award Winner

Design, Integration and Implementation of an Internal Referral Process

IreneChen, MSHI

Problem Statement: There are high volumes of patients being seen in primary care and many of them require additional specialty services. Due to the abundance of patients seen daily, scheduling and tracking specialty referrals can be challenging. Additionally, specialist consults tend to increase the cost of care with more advanced diagnostic tests and to minimize spending there needs to be an efficient and effective way of communication between the PCP and specialist. **Methods:** A PCP-sponsored project was started to improve sending internal referrals. This pilot consisted of four different specialties; Dermatology, Neurology, Gastroenterology, and a RASH clinic. To make this pilot successful, the workflow needed to be seamless. It was critical to integrate the electronic medical record (EMR) with a completely different admit, discharge, transfer (ADT) scheduling system. Different workflows would need to exist for expedited versus routine referrals along with the appropriate tracking and scheduling status for the PCP. The project team consisted of people from multiple teams including an EMR architect, orders specialist, scheduling team, interfaces architect and clinical team. To spread awareness of this new referral process, this information was shared with the different pilot department staff meetings. **Results:** Primary care providers have their own position when logging into the EMR and that is the only position locked down with the ability to place a referral order to the pilot specialty clinics. The placed order will go to the specialty consult pool for visibility to all specialists. Next, the specialist would need to approve expedited referrals using a well-known existing workflow. Once an expedited referral was approved or routine referral was placed, the order would flow downstream to the ADT system onto the specialty clinic's scheduling queue. Schedulers would then schedule the appointment based on referral type. Once scheduled, these referral orders would fall off the ADT work queues based on order age and appropriate notification to the patient would occur. **Conclusions:** After a successful pilot with four of over eight months, three additional clinics have been added to use these referral orders. Maintaining provider workflow allowed for an easy transition of care and improved communication between providers. "Effective communication between primary care physicians (PCPs) and specialists regarding patient referrals and consultations is necessary for coordinated care".² **References:** 1. Pho, K. (2012, January 24). Why more primary care doctors are referring patients to specialists. KevinMD.com. Retrieved from <https://www.kevinmd.com/blog/2012/01/primary-care-doctors-referring-patients-specialists.html> 2. O'Malley, A. S. and Reschovsky, J. D. (2011). Referral and Consultation Communication Between Primary Care and Specialist Physicians: Finding Common Ground Retrieved from Arch Intern Med. 2011;171(1):56-65. doi:10.1001/archinternmed.2010.480



Summer Institute in Nursing Informatics 2019
Poster Presentation

The development of nursing informatics competency model for rapidly and effectively training clinical nurses in hospitals

YuanChen, RN

Objectives: The development of nursing informatics in China is at its preliminary stage which fails to meet the tremendous needs of rapid EHR progress in hospitals. Therefore how to rapidly and effectively build up the nursing informatics competency for clinical nurses becomes very important for the success of hospital EHR as well as modern practice context for nurses. Methods: We invited six full-time informatics nurses, in the Jan. to Mar. of 2018, from hospitals with more than 1500 beds and were benchmark in developing hospital EHR and nursing information system (NIS) in China, including Taiwan. We used the Nominal Group Technique and Delphi approach, organized and chaired by one methodology expert, to acquire their knowledge for the critical success factors (CSF), necessary for clinical nurses with four levels to have successful EHR and NIS projects: the Entry level for all, the Trained for teaching, the Design to design and develop new components, and the Innovator to make nursing better. One run of NGT and two runs of Delphi opinion acquisition were implemented to generate the pool. Item analysis was used to remove less significant items. Factor analysis was used to examine the validity of model. Cronbach α was run to test the model reliability. Results: A total of 48 factors from 3 dimensions were obtained at the first stage. There is only one factor needed for the Entry level, Be Able to Use. There are 12 factors necessary for the Trained, 43 for the Design, 46 for the Innovator. At the second stage, only 37, out of the same three dimensions, were reserved in the model. The three dimensions were Computer Skill, with the first three leading factors the Use of Productivity Software Skill, Programming and Development Skill, and System and Function Framework; Comprehensive Application Skill, with three leading items Facilitating Quality Improvement, Familiarity with NIS and its Operation, and Doing Scientific Study; and Informatics Skill, with three most important items System Design and Planning, Feasibility Analysis, and Information Security. The model's Cronbach α was large than 0.8. Discussion and Conclusion: Our model pinpoints the importance of better use of clinical work productivity software related to practical work, emphasizing more nurse's importance in joining the development of system design and development, better use of information in quality improvement, and the nurses' continuous participation in from system design to implementation, and system maintenance. . Key words: nursing informatics; informatics competency; informatics competency model, computer skill, application skill, information skill



Summer Institute in Nursing Informatics 2019
Poster Presentation

mHealth app in reducing the depression of family caregivers

Yi-RuChiu, RN

Background: The rapid aging of the world population has become an important issue. From 2015 to 2050, the proportion of the world's elderly population has increased from about 12% to 22%; the number of elderly people in the world will reach 1.4 billion in 2030 and 2.1 billion in 2050. (Nations, 2017). At the end of March 2016, Taiwan's household registration registered 3.31 million people over the age of 65, accounting for 14.1% of the total population, and has entered the Aged Society. **Purpose:** With the increase in the population of a country and the extension of the average life expectancy of the nation, the demand for medical and long-term care services has also increased significantly. Long-term care services have caused great psychological pressure on family caregivers, leading to depression. In this study, we developed a mHealth app based on the home-care needs of patients in Taiwan to explore whether the mHealth app can reduce the depression of family caregivers. **Methods:** This experimental study, including 30 primary family caregivers, was conducted from October 2017 to May 2018. We based on the Center for Epidemiologic Studies Depression Scale designed an online questionnaire system to collect data on the depression assessments of the 30 family caregivers. We conducted the survey three times. First was prior to using the mHealth app, the second was a month after the first survey and the third was two months after the second survey. The results were analyzed using SPSS to describe the distribution of variables. Descriptive t-tests and one-way analysis of variance were performed to analyze the effects of the usability of mHealth app to reduce depression. **Results:** In this study, the degree of depression decreased with the intervention time, and the difference between the result of prior to using the app and after using the app for three months was statistically significant P



Summer Institute in Nursing Informatics 2019
Podium Presentation

The IMPACT ACT and the Data Element Library- Advancing data interoperability to support care coordination and improved health outcomes in post-acute care

ElizabethConnor, MS,RN

The IMPACT Act requires the submission of standardized and interoperable data in multiple post-acute care settings, including Home Health (HH), Skilled Nursing Facilities (SNFs), Inpatient Rehabilitation Facilities (IRFs) and Long-term Care Hospitals (LTCHs). The intent of the IMPACT Act is to support access to longitudinal information to: help inform clinical decision making and promote coordinated care; enable comparison of data across settings; and to improve discharge planning and health information exchange- all of which will lead to improved efficiencies, improved quality of care, and improved health outcomes. The Data Element Library (DEL), a new public resource for CMS' post-acute care assessments and their related health IT standards, will be shared, including how DEL content can be used to support health information exchange and EHR interoperability using nationally accepted health IT standards.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Optimizing Documentation for the Observation Class Patient

MelanieDodson, MSN, RN and BJ Breeze, MS, RN

Our hospital system identified a need for streamlined documentation for patients held in an Observation class status. These patients are considered outpatients, yet are treated on inpatient units or as boarder patients within the Emergency Department (ED). Despite shorter lengths of stay, the number of required documentation elements is the same as for inpatients and ED Boarders, placing an undue documentation burden on nursing staff. Nurses frequently complain about the amount of time spent documenting on these patients, with staff and patient satisfaction suffering. In addition, the EHR build for certain documentation items differs between ED and inpatient settings even though the documentation elements are the same. This causes patients to be asked some questions multiple times, which further impacts satisfaction for both patients and staff. To address the problem, Clinical Informatics staff first spent time observing nurses as they cared for these patients. The goal of the observation sessions was to quietly and unobtrusively see how nurses use the EHR in real-life without comment or guidance. In order to capture variances in workflow, we spent time in both ED and inpatient environments and at different facilities within the health system. Particular care was taken to determine which screens and tools within the EHR the nurses are using as they complete their documentation. We then assembled a work group consisting of bedside nurses and nurse managers from across the hospital system in conjunction with IS&T, Regulatory, Compliance, Clinical Informatics, and Project Management. With guidance from our executive sponsors from the health system's Chief Nurse Officer Council, the group was empowered to make decisions to reduce the documentation burden for Observation patients. Our goals were to optimize documentation and reduce redundancy without compromising patient safety. The resulting design decisions led to a 75-item decrease in documentation elements, optimization of those elements shared between ED and inpatient settings, and enhancements to our existing flowsheet documentation to be more meaningful in the care of Observation patients. A complete revision of our Observation patient documentation has been targeted for a June 2019 release. In order to enhance usability, we will use existing documentation tools within the EHR that nurses at our system are already familiar with and are using on a daily basis. To evaluate the effectiveness of our efforts, we will be using our vendor's Workflow Analyzer tool to capture data such as keystroke-level model (KLM) time, screen switches, mouse wheel clicks and scroll distance, keyboard-mouse transitions, and key presses. We are currently in the process of gathering pre-implementation data and will compare these results with our data post-implementation. We will be able to speak to our findings, successes, and barriers as the project continues through July of this year and anticipate providing preliminary results as part of this SINI presentation.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Providing clinicians with the necessary knowledge of a patient's deterioration, in near-real-time at the bedside.

DouglasDotan, MA, CQIA

The goal and objectives are to support clinicians, hospitals, and ambulatory surgery centers to provide safe care to patients by providing clinicians with the necessary knowledge of a patient's deterioration, in near-real-time at the bedside, so they can take the appropriate preventive action before harm occurs. The ONC award winning "3-Click" Solution innovation enables the clinician to identify patient safety and quality of care issues caused by the electronic medical record itself or associated with a medication, a test, a process or a device, and submit the issue in the AHRQ Common Formats to a separate database for analysis and process improvement in real-time. The data auto-populates agnostically from the EHR to the Common Formats event database. Integration of the 3-Click Solution with the EHR will help clinicians report EHR usability, quality and safety issues faster, and reduce nurses and physicians' workload. It will reduce the cost of care by streamlining the accurate collection of disparate patient data, making the connection between data points and the sharing of that data to identify and prevent potential patient deterioration starting at a patient's bedside, extending to payers and providers. In the complete Pegwin Insights platform (that includes the Pegwin 3-Click Solution and other features) clinicians see specific patient risk profiles that are created for each patient as their data is entered into the patient record. The Machine Learning and the ethical Artificial Intelligence algorithms are continually updating and predicting, in close to real-time, each patient's cumulative risk and displaying the required preventive action so caregivers can proactively prevent potential patient harm. Pegwin Insights leads the way in addressing the importance of use and adoption of Fast Healthcare Interoperability Resources (FHIR) and ethical Artificial Intelligence to improve patient health and the quality of care where Machine Learning acts as a very powerful clinical assessment for establishing a longitudinal Quality and Safety database. The primary objectives of this large database are to: 1. Collect, document, and analyze data to generate reports on outcomes related to select quality indicators based on AHRQ definitions e.g. postoperative Respiratory Failure, triggered by multifactorial issues such as drugs/opioids, and/or equipment and/or Skilled Nursing Care (SNC), and/or physiological, and/or environmental, and/or human factors and so on. 2. Reduce time-to-document by using a Virtual Patient Safety Conversational Agent integrated within the clinical workflow. 3. Significantly decrease the time required to obtain and record safety and quality related events, avoiding confirmation biases and retrospective distortion. 4. Provide for flagging of adverse events by estimating the "possible likelihood prediction" based on historical cases. 5. Interact with the caregivers in real time to confirm or ask for verification and validation of "positive" recognition - a reversal Turing Test for ethical Artificial Intelligence. 6. On any negative recognition, the Machine Learning could re-train itself by enabling evolutionary computation, making it possible to discover entirely new objects and behaviors that maximize a given objective using a population of retrospective or historical and prospective candidates to search for solutions in parallel, emphasizing novel and surprising solutions.



Summer Institute in Nursing Informatics 2019
Podium Presentation

EPIC Workflow Optimization
Project 1: Head to Toe Flowsheet

JeanetteElliott, BSN, CCRN

A clinical/analyst multidiscipline team was formed to address the cumbersome head-to-toe documentation design and process which has resulted in increased burden on nursing. The team performed nursing survey to assess perception of documentation quality and satisfaction. The survey confirmed perception of burden and lack of knowledge of documentation by exception. Epic tools were utilized to obtain baseline time spent within electronic medical record. This data found nurses spent most time within simple assessment flow sheet. The team met weekly with stakeholders from all unit to optimized assessment flow sheet. The goal was to Streamline EPIC documentation to reduce the number of fields/steps needed to perform a head-to-toe assessment while ensuring quality, improve relevant Metrics by 20%, improve staff satisfaction, and meet all the regulatory requirements. The DMAIC process was utilized which resulted in optimized flow sheet design, updated policy to reinforce documentation by exception, and education and elbow support during go-live (December 4, 2018). The result was 33% reduction (1,142 Documentation choices) removed within the head to toe assessment. Next steps will be to repeat nursing survey, review current Epic tools, and optimize remaining flow sheets.



Summer Institute in Nursing Informatics 2019
Poster Presentation



Research Poster Award Winner

Toward Optimizing Usability in e-Government Healthcare Administration Systems: Lessons Learned from An In-Depth Usability Evaluation Effort

Forhan BinEmdad, BSC and Günes Koru, PhD

Introduction: Evidence shows that perceived complexity detracts from successfully adopting e-government healthcare systems. The problems with ease of use, despite the existence of usability guidelines and investment of substantial resources for design and development, are unfortunately still highly persistent and widely prevalent in this domain. Therefore, it becomes crucial to generate and document evidence which can inform and support government healthcare and information technology (IT) professionals in their IT development and adoption efforts. In this context, this study had the following objectives (a) implementing an iterative usability evaluation initiative to identify top usability challenges and improvement opportunities in a real-life e-government system, and (b) providing evidence-based recommendations for effective and efficient usability improvement which can be useful for similar systems adopted elsewhere. Methods: We have designed and conducted an iterative usability evaluation project for an actively used e-government healthcare system adopted by one of the states in the US. In the first iteration, seven usability experts performed an evaluation of compliance to Nielsen's usability heuristics. Secondly, a think-aloud interview was conducted with 23 participants for usability testing. In addition, an online survey based on the questions in the System Usability Scale (SUS) was conducted with 1,800 system users for a quantitative assessment of usability. Finally, a semi-structured focus group interview was conducted to obtain further detailed information regarding usability challenges and improvement opportunities. Results: Through heuristic evaluation, the usability challenges were identified as navigation problems, unfamiliar icons, and a complex index page structure. Think aloud interviews identified confusing name conventions, lack of tutorials, and lack of filtering options as the top usability challenges. The survey resulted in a SUS score of 35, which is a very low score for any system indicating that usability problems should receive a high priority. In online surveys, almost 20% participants "strongly disagreed" that learning this system is easy, instructions are understandable, system performs without error or system is comfortable to use. In focus groups, challenges like inexperienced developers, lack of training for the users, and lack of co-ordination between users, developers, and stakeholders were most highlighted as organizational and people challenges with usability improvement. Hiring skilled professionals to resolve top usability challenges and training the system users seem to be the most promising directions. Conclusions: This study tackled a real-life usability evaluation project for an e-government healthcare administration system which resulted in evidence regarding the important usability challenges, drawing further attention to this important problem, and resulted in recommendations. Future studies can further focus on the people and organizational challenges of usability improvement in this problem domain.



Summer Institute in Nursing Informatics 2019
Poster Presentation

A Beginning Exploration of NP Perceptions in Sharing Clinical Notes with Patients

Catherine Fant, Ph.D. RN-BC; Deborah Adelman, PhD, RN, NE-BC;
and Debbie Noguera Conner, PhD, FAANP

A Beginning Exploration of NP Perceptions in Sharing Clinical Notes with Patients Purpose: The purpose of this research was to describe how NPs perceive sharing their clinical notes through a patient portal. Research in the area of sharing clinical notes has focused on the perceptions of physicians and other healthcare providers (Vodicka, 2013; Weinert 2017). To date, there are no studies on the perception of the NP, which was the driving force for this research. Sharing of clinical notes and conversations they generate have been identified with improved medication adherence, better understanding of treatment plans, and increased engagement in one's health care (Bresnick, 2015; Weinert, 2017; Wright 2015). There have been some questions raised about possible increased workloads and the perception that patients may misunderstand what is written, as well as possible HIPAA violations. **Research Question:** What are the perceptions of nurse practitioners of having their clinical notes shared with the individual through a patient portal? **Methodology:** A descriptive quantitative study was conducted to address the research question. To that date, the literature had not addressed the NP who shares clinical notes with patients and it was felt that a descriptive approach was needed to describe the current state. The research study was approved by the Purdue University Global's IRB. **Results:** A total of 57 participants responded to the request to participate. The majority were FNPs (61.4%) and 70.2% were MSN-prepared. The majority had been in practice for six or more years (63.2%). Approximately half used patient portals where their clinical notes were shared with their patients. Participant perceptions about sharing their clinical notes were somewhat to very positive (40.3%; n = 23). Many (90%) identified their greatest concerns were whether patients did or would be able to read and understand their clinical notes, along with the impact on patients based on how they wrote their notes. More than 70% felt specifically apprehensive about patients not understanding medical terminology. Open-ended question responses indicated that participants were concerned about provider and patient honesty in providing information. They wrote that they would be less likely to include details that might be misinterpreted by patients. Several participants were more positive in their responses, writing that they were "comfortable allowing my patients [sic] read their clinical notes", that "an even greater need to make myself clear and well understood when speaking to them" resulted from the sharing, and one felt "that it may improve the understanding of their care plan, and improve self-management". **Implications for Nursing Practice:** The change resulting from electronic healthcare records presents an accompanying shift in organizational culture to create better environments for patients, including improving ways of communicating that engage patients and their families. Shared clinical notes provide an opportunity to achieve these goals. NPs can facilitate this transition to shared clinical notes by having meaningful conversations about what is being written and why. This process may provide an opportunity to explore attitudes and perceived barriers to understanding health promotion and disease prevention, disease management, and patient and family education.



Summer Institute in Nursing Informatics 2019
Podium Presentation

Role of the Physician Informaticist in reducing physician burden and burnout with Electronic Documentation Systems

AthenaFernandes, DNP, MSN, RN-BC

Background: Physicians often practice in more than one clinical setting (i.e. ambulatory offices and hospitals). If they are part of a large private practice, they may take an on-call rotation infrequently (once every six weeks for example). At each practice setting where the physicians document care via an Electronic Health Record system (EHR), they are faced with uniquely configured EHR products, even if the base software product is the same. Often navigating the EHR is time-consuming, labor intensive and non-intuitive. Additionally, these EHR systems are continuously being optimized and upgraded to keep-up with the latest security and anti-virus technology, streamline processes, meet regulatory requirements, reimbursement needs, and incorporate best practices for care delivery. The differences in each EHR, the constant changes made to these applications and the varied clinical rotation schedules that physicians have at each practice setting, all pose a challenge for physicians to become and stay proficient with EHR use. Healthcare is currently faced with a physician burnout epidemic and the literature suggests that the EHR is partly responsible for this. While hospitals invest in the implementation and optimization of EHRs, they often neglect to allocate dedicated resources towards on-going support for physicians with EHR use. Investing in an on-site physician informatics team, who not only understand the clinical workflows and the functionality of the EHR, but also provide at-the-elbow support, can help reduce EHR burden and burn-out. Methods: In 2016, a physician informaticist team was established at a 180+ bed community hospital, where the majority of physicians are non-hospital employees. The team handles physician on-boarding EHR education, provides at-the-elbow EHR support, offers one-on-one personalization sessions to optimize physician efficiency within the EHR, supports a 24/7 clinical help desk to handle off-hour phone support, advocates for physician focused enhancements to the EHR, reports issues with EHR functionality, and much more. Over the past two years, the role and responsibilities of the team have evolved to meet the needs of the physicians. Results: The physician informatics team is centrally located within the hospital. Their office serves as an all-inclusive clinical informatics concierge service for physicians. The team of informaticists are nurses who understand both clinical workflows as well as the technological aspects of managing patient care via the EHR. They are able to assist physicians in real-time by triaging physician EHR requests and managing EHR issues through to resolution, thereby minimizing the time spent by physicians in trouble-shooting their EHR issues and allowing physicians instead to focus on delivering patient care. Conclusions: Physicians working with multiple EHRs face unique challenges. Having a dedicated physician informatics team to support their EHR needs can reduce EHR burden and burn-out.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Electronic Care Plans - Nurse Informaticist's Role as Advocate

ZabrinaGonzaga, MSN,RN and Marla Throckmorton, MSN, RN, CMPE

This presentation will provide an overview of electronic care plan standards, strategies to identify clinically-relevant and meaningful concepts for exchange, identify the benefits of adoption, and suggest how to increase implementation and use. Electronic care plans can improve efficiency and resolve the duplicate entry issues that are associated with paper care plans and standards that make them interoperable. Nevertheless, uptake and adoption of electronic care plans lags behind the adoption of interoperable electronic health records (EHRs). Consolidated Clinical Document Architecture (C-CDA) provided a standard for electronic exchange of care plan information. Vendors have access to a care plan standard that generates a document from a C-CDA compliant EHRs. The C-CDA care plan contains input from interdisciplinary team members about patient health concerns, a list of patient goals with appropriate interventions, and progress towards these goals. The C-CDA care plan, which is a general care plan, became the foundation for specialty-specific care plans for pharmacists, oncologists and nutritionists. The rate of adoption for these each of these specialty standards remains low, with the exception of the electronic pharmacy care plan (ePhCP). Pharmacy services are a key segment in the continuum of care. The implementation and adoption of the ePhCP exemplifies how a pharmacist can share information with support teams to improve care team collaboration, reduce duplicative data entry, support medication reconciliation, and contribute to value based care through quality measurement. An ONC-funding High Impact Pilot for electronic care planning supported development of two ePhCP specifications: one based on C-CDA and the other using the emerging Fast Healthcare Interoperability Resources (FHIR) standard. By the conclusion of the pilot, 22 vendors had opted in to implement one or the other of the ePhCP standards. This presentation will include examples of care plan exchanges between a primary care provider and pharmacy and between a pharmacy and state Medicaid. The presentation will illustrate methods to capture core clinical data elements in a care plan and track patients through different settings. As electronic care plan standards evolve, nurse informaticists play a central role in pursuing the viability and applicability of care plans across healthcare settings. Nurses are the common denominator in most care settings and have the power to drive change. Nurse informaticists involved in standards development can contribute their expertise to identify core concepts critical to patients' journeys in the continuum of care. Nurse informaticists are in the position to advocate for the use and adoption of care plan standards. Improvements in patient outcomes inspire this effort. From Florence Nightingale forward, patient outcomes remain the central focus of nursing. The presentation will include actionable suggestions to further electronic care plan adoption. Nurses must adapt their practice to the digital age and advocate for increased communication across the continuum of care through electronic care plans.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Characteristics and Effects of Mobile Technology-Integrated Worksite Health Promotion Programs on Body Weight and Composition: A Systematic Review

MyeunghyeHan, MS, RN; Carla Storr, ScD, MPH; and Kelly Doran, PhD, RN

Background: Currently, among American working adults, non-communicable diseases such as cancer, diabetes, and cardiovascular diseases are highly prevalent health issues. Employers have become increasingly aware of the importance of workers' health and implement worksite health promotion programs (WHPPs) to improve health-related behaviors and outcomes among employees. New platforms of WHPPs that can overcome the barriers and challenges of existing programs (e.g., inconvenient locations, scheduling or time limitations, ineffective marketing and engagement) are urgently needed. Mobile health technology (mHealth) has increasingly been recognized as a useful platform for health promotion programs but little is known about their adoption and effectiveness in changing body weight and composition. **Objective:** The purpose of this study was to summarize the features (theory and components of the intervention, targeted behaviors, types of mobile and non-mobile components, effectiveness) of mHealth integrated WHPPs on changes in body weight, Body Mass Index (BMI), waist circumference, body fat, and body muscle. **Methods:** A systematic search of mHealth-integrated WHPPs targeting changes in body weight and composition published in peer-reviewed journals between January, 2010 and June, 2018 was conducted. Medical subject heading terms and keywords in various combinations were used in an electronic search of the following databases: Pubmed, Embase, Business Source Premier, CINAHL, and Cochrane. The Cochrane Risk of Bias Assessment tool and Risk of Bias Assessment tool for Non-randomized Studies were used to evaluate the quality of the interventions. **Results:** Twelve articles were identified appropriate for this review. The majority of the WHPPs (9) implemented combined mobile and non-mobile based interventions, and three WHPPs used only a mHealth intervention. Four studies were randomized controlled trials (RCTs), four pre-post design, and two were prospective cohort studies. The most commonly used mobile-based components were data entry, providing information, and goal setting. Physical activity improvement was the most common targeted health behavior to achieve the health outcomes (n=12). Although, types of interventions and duration of the studies varied (3-12 months), the majority of studies showed a positive impact on reduction in body weight (n=10, -1.11kg ~ -3.5kg), BMI (n=5, -1.87kg/m² ~ -.04kg/m²), waist circumference (n=5, -3.25cm ~ -1.0cm), and body fat (n=4, -1.86% ~ -.08%). All studies had some risk of bias, however, over half of the studies showed good quality of evidence in every category; selection bias (58.33%), reporting bias (83.3%), performance bias (58.33%), detection bias (75%), and attrition bias (58.33%). **Conclusion:** mHealth-integrated WHPPs have been applied in various worksite settings and have shown positive impacts on achievement of targeted health outcomes. However, further well-structured RCTs are needed to examine the effectiveness of mHealth-integrated WHPPs, accurately. **Keywords:** Worksite health promotion program, mobile technology, body weight, body composition, review



Summer Institute in Nursing Informatics 2019
Podium Presentation

Shrink-Wrap your EHR

SherriHess, MS-IS, BSN, RN-BC

Banner Health has listened to clinicians in all venues and have been evaluating their time in the patient record as well as what is truly essential for them to document about the care they provide. By evaluating clinical efficiency metrics, such as total time in the EHR, total clicks, time in documentation, and regulatory requirements Banner has designed their physical assessment and admission data set to the essential and critical elements. Banner has joined a cohort of other health organizations across the US who are also facing the same challenges to develop an essential data set for nursing documentation. Banner will be sharing their initial analysis of efficiency metrics, opportunities to tune their system and their results when nurses get to the essentials of documentation. One example of improvement was in our ED. We reduced clicks by 7% and improved nursing efficiency by 30 seconds per patient.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Establishing a Process for Reducing Nursing Documentation Burden Through Discrete Data Analysis

Cassandra Hunter, MSN, RN, CPNP

Introduction/Background Electronic medical record implementation has transformed paper documentation into electronic workflows often adding new documentation but rarely taking away from the process. Documentation should tell the patient story through the clinician's eyes. It needs to support the high quality care provided and meet regulatory requirements without causing documentation burden. The documentation needs to be structured but not so structured that it takes away from the patient story. In an effort to reduce documentation burden, nursing admission and discharge forms are optimized and standardized through nursing led workgroups. Methods Boston Children's Hospital participated in a multi center national effort to establish an Admission Pediatric Essential Clinical Data (ECD) set. A work group was formed and vendor led. Nursing admission forms were included in the scope of the project. The group conducted a literature review and established guiding principles for evaluation of forms. Utilization data was extracted per hospital and included form, section, and event code. This data was analyzed using the guiding principles, regulatory requirements and evidence based practice. A workgroup has been formed at Boston Children's to replicate the Pediatric ECD process with localization to account for state regulations and hospital policies that may differ. The standard form will need to be retrofitted into existing documentation. The group has accepted the initial guiding principles but enhanced them to determine what to do with event codes being removed and to account for workflows that may be impacted as a result of modifications to the admission history. Results Participants in the project had an average of 27 sections and 333 unique event codes. Boston Children's admission history contains 39 sections and 606 unique event codes. Prior to optimization, the vendor form had 35 sections and 359 event codes. The final draft of the ECD form contains 12 sections and 83 event codes. The drafted form will be finalized based on the pilot results. **Discussion/Conclusion** While we continue to pilot the process with the admission assessment we are expanding the work to include additional forms including those within the discharge process. The process will be replicated to streamline and reduce the documentation burden across the different hospital venues and enhance the nursing patient care experience.



Summer Institute in Nursing Informatics 2019
Poster Presentation

A Systematic Approach to Facility Discharge Coordination

MercedesKalin, AA

Purpose: Current facility discharge planning practices contribute to delays in discharge to community skilled nursing, long term care, and sub-acute rehabilitation facilities decreasing patient outcomes and patient satisfaction, contributing to avoidable days in-house, Alternate Level of Care (ALC) Days, and result in decrease in reimbursement, or non-reimbursement of days for acute care facilities. **Synthesis of Evidence:** Updating practices to provide a systematic, structured approach to the facility discharge planning process with active communication between the Discharge Coordinator, patient, community Intake Coordinator, floor staff, and medical team is vital to optimize timely patient discharge to facility. **Practice Change:** The Discharge Coordinator (DC) will perform daily rounds to identify new patients appropriate for discharge to facility, obtain report from inpatient staff, and financial information from patient/family. Rounds will also provide brief updates as needed to patients awaiting placement. The DC will contact all in-network, level of care appropriate facilities and provide verbal report to community intake coordinators prior to sending medical records. Records will then be sent to remaining interested facilities using a secure electronic transmission method with frequent updates. The DC will meet with patient to present possible facilities to gauge patient/family preference. Decision will be made based on available bed offers. Weekly meetings with Interdisciplinary Team regarding difficult placements will be implemented to discuss barriers to placement and coordinate services to facilitate a safe and timely discharge. **Implementation Strategy:** Education of the Discharge Coordinator regarding practice changes and expectations. Immediate change by DC to secure electronic transmission of medical records. Notification of initiative to inpatient team, and need for prompt notification of discharge date and participation in discharge planning meetings for difficult placements. Regular audits of practices to ensure adherence to structure and identify practices that need improvement. **Evaluation:** Anticipated outcome will show a reduction in ALC and Avoidable Days within 60-90 days. **Conclusion and Steps:** Providing a structured facility discharge planning system could be vital to reducing Avoidable and ALC Days. A Facility Discharge Planning Initiative should be implemented and include coordination between Nursing, Case Management, Social Work, and Medical to discuss expectations, design a structured program, and implement a policy. The process should be frequently audited and structured data should be kept.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Relieving the Burden of Nursing Documentation

MarieKozel, MBA, BSN, RNC_BC

Nursing literature contains much work discussing to the burden of nursing documentation, the time spent in the Electronic Medical Record (EMR) and the resultant decreased time in direct bedside patient care. As recently as January, 2019, the Office of the National Coordinator is reviewing recommendations for reducing this burden set forth by the Alliance for Nursing Informatics. Additionally, The Joint Commission, as part of their strategy to address the nursing shortage crisis, is placing emphasis on reducing the documentation burden. Partnering with an EMR vendor, one health care organization is tackling this burden by developing and implementing an Essential Clinical Dataset. The work started with review of the Acute Care Adult Admission Intake and is continuing the work with the Head to Toe Systems Assessment. The dataset is developed after extensive literature review and regulatory compliance analysis. Once the dataset is defined, a gap analysis between the dataset and current state is completed with recommendations for changes to the EMR. Executive guidance is from the Chief Nursing Officers and a small steering committee of clinical and regulatory experts completes final review and approval. Partnering with the Lead Nurse educator finalizes the project with education/communication to nursing staff. Outcomes not only include a reduction in un-necessary data fields but also improved aesthetics and efficiency for documentation of the typical assessment and the ability to document the atypical when and if needed. Additional outcomes include an improvement in nursing satisfaction related to interaction with the EMR as well as decreased time.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Automating a Maternal Early Warning

MarieKozel, MBA, BSN, RNC_BC

Implementation of an automated Early Warning Score (EWS) with the Electronic Medical Record (EMR) was the first time that such a tool was used within the organization to provide clinical decision support and alerting to predict patient decline and alert the nurse. The tool chosen for the Medical Surgical population was not indicated for use in the Obstetric population, leaving this group without the benefit of early warning. Shortly after go live of the EWS tool, The American College of Obstetricians and Gynecologists published the article "The Maternal Early Warning Criteria, A Proposal From the National Partnership for Maternal Safety" by Mhyre, J. et al. This evidenced based article was evaluated by the organization's Perinatal Safety Committee. Automation of the evidenced based criteria within this publication to provide clinical decision support for an obstetric early warning tool was requested by this team. Design of the Maternal Early Warning Score (MEWS) commenced starting with the Systolic and Diastolic BP parameters. In addition to clinical decision support for both nursing and providers, a protocol was developed and approved for automation of interventions. In addition to clinical decision support, alerting and a standard protocol for the Obstetric population, the team now has metrics to evaluate compliance of nursing and providers to action when alerted and implementation of the interventions. While there were many lessons learned along the way, the journey taken may help others who desire to provide increased safety for the pregnant and postpartum patients within the organization.



Summer Institute in Nursing Informatics 2019
Poster Presentation

DNP Student Experience with Data and Mastery of Informatics Competencies on Data Analysis of Patient Outcomes

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

Problem Statement: The Doctor of Nursing Practice (DNP) program should prepare DNP graduates to use information technology to "analyze data from practice", "predict and analyze outcomes", and "examine patterns of behavior and outcomes" (AACN, 2006, p.12). However, minimal literature exists on the course content necessary to adequately prepare DNP graduates to attain competency in this area. To increase student skills working with data, we provided additional content on working with data using outcome metrics. We also developed an agreement with a regional medical center to obtain de-linked actual patient data providing students with experience exploring clinical data to assess patient outcomes. The aim of this study was to assess students' prior experience with data and their ability to master competencies including an advanced competency with a focus on analysis of patient outcomes such as length of stay (LOS) and readmission rates (RR). **Methods:** A retrospective descriptive design was used to examine prior data experience and competency mastery using a convenience sample of students enrolled in an online Informatics course. Data collected included student demographic characteristics and self-assessment of baseline experience with datasets or databases (A), working with "Big Data" (B), or working with data to improve patient outcomes (C). Student mastery of competencies focused on datasets (simple Excel skills), exploration of public databases, or analysis of data on patient outcomes (LOS and RR) were scored as follows: 1 (competent) or 2 (not competent). The proportion of students mastering the competencies were compared using the exact McNemar test. Frequencies were also performed. P-values less than 0.05 were considered statistically significant. The Institutional Review Board designated the study as exempt. **Results:** Students held BSN (n=36) or MSN degrees (n=10). Most were female (84%). DNP concentrations included Family Nurse Practitioner (48%), Adult Geriatric Acute Care (28%), Adult Geriatric Primary Care (6%), and Psychiatric (10%) tracks. Analysis of students' previous experiences revealed that 48% did have experience working with datasets, 14% with "Big Data", and 78% with data to explore patient outcomes. Those with previous experience reported that most of the experience was obtained in statistics courses (A; n=12), use of datasets in the work setting (B; n=3), and experience in the work setting using information to make changes to care delivery (C; n=20). An exact McNemar's test determined there was a significantly greater proportion of students who mastered competencies working with datasets (88%; p=.001) or database exploration (76%; p=.049) in comparison to the competency focused on analysis of clinical data examining patient outcomes (58%). There was no difference between the proportion of students mastering the dataset and database competencies. **Significance:** Students had minimal prior experience with datasets or databases with most occurring in academic course work but were able to master these competencies. While many used data in the work setting to improve patient outcomes, it did not translate to the mastery of a competency focused on analysis of patient outcomes. This indicates that additional content may be necessary to ensure student proficiency in this area.



Summer Institute in Nursing Informatics 2019
Poster Presentation

DNP Quality Improvement Toolkit for Best Practice Use of Active Secondary Data

CourtneyOmary, MSN, RN-BC

Background In Advancing Healthcare Transformation: A New Era for Academic Nursing, the American Association of Colleges of Nursing (AACN, 2016) make five recommendations based on their findings that academic nursing is not positioned as a partner in healthcare transformation. Their recommendation for academic nursing to invest in nursing research programs and better integrate research into clinical practice clearly intersects with the promise of big data (AACN, 2016). Big data and translation science were two emerging and priority areas identified by the Council for the Advancement of Nursing Science (Henly et al., 2015). Strengths of big data include availability from several sources to inform intervention research. Data sharing, faculty expertise and understanding of data science are barriers to using big data (Henly et al., 2015). Opportunities in translation science include collaboration between research and quality doctorates with clinical expertise, however a lack of commitment to dissemination, little opportunity for interdisciplinary collaboration and level of faculty expertise in methods of translation and implementation are threats (Henly et al., 2015). Doctoral programs in nursing are designed to prepare nurse scientists and scholars, and Doctor of Nursing Practice (DNP) graduates must demonstrate the ability to translate knowledge to practice (AACN, 2006). Nursing participation, through collaboration, research and dissemination of data driven interventions, is important to representation and relevance of nursing knowledge and expertise in healthcare policy (Gephart, Davis, & Shea, 2018). Recommendations from healthcare system leaders like Institute of Medicine (IOM), Centers for Medicare and Medicaid Services (CMS) and National Institutes of Health (NIH) all point to further development of continuous learning and translation of evidence into practice (Smith, 2012; CMS, 2018; NIH, 2017). Gaps in knowledge exist in best practice to achieve translation of data-driven evidence both to and from practice, and EHR data is a fundamental part of that translation (Frink, 2016). Based on an evaluation of health science students' research skills, Kingsley and Kingsley (2009) make a strong suggestion to design and incorporate information literacy into graduate-level curricula. AACN's Essentials of Doctoral Education for Advanced Nursing Practice (2006) established an essential competency for advanced practice nursing to "utilize information systems to evaluate programs of care, outcomes of care and care systems." Methods DNP students will receive an educational intervention in the form of a toolkit. The DNP QI Toolkit will include training on local policy for clinical research, data use agreements, best practice for accessing secondary data and foundational skills for clinical research. A toolkit is defined by the Agency for Healthcare Research and Quality (AHRQ, 2018) as a "collection of information, resources or tools to guide users to develop a plan or organize efforts to follow evidence-based recommendations or meet evidence-based specific practice standards." In other words, a toolkit is an action-oriented technique of promoting the translation of research findings into policy and practice (AHRQ, 2018).



Summer Institute in Nursing Informatics 2019
Poster Presentation

Identifying the Top Coordination Challenges and Opportunities in Achieving Value-Based Home Care: A Literature Review to Inform IT Adoption Initiatives

Mohammad IshtiaqueRahman, BSC; Dari AlHuwait, PhD, Aswini Baskaran, MSC; Kevin Dainel, BSC;
and Gunes Koru, PhD

Introduction: Care coordination is crucial for home health agencies (HHAs) as participating in value-based purchasing (VBP) model of the Centers for Medicare and Medicaid Services becomes mandatory by 2022. Through better care coordination, HHAs can provide cost-effective and quality services, remaining viable businesses under the reimbursed rules. To be effective and efficient, the organizational initiatives of HHAs to achieve care coordination can substantially benefit from an analysis and synthesis of the findings reported in the prior studies. Accordingly, this study (i) determined the pressing challenges and opportunities in better coordination of home care services, (ii) identified directions for leveraging information technology (IT) to respond to those challenges and opportunities, and (iii) derived recommendations for the IT-based initiatives of HHAs for improving care coordination. **Methods:** Literature review was adopted as it provides an opportunity to analyze and synthesize findings from a number of studies. PRISMA guidelines were used since they provide a systematic approach. Keywords were developed using the standard definition of coordination by AHRQ which included collaboration, communication, competency, discharge process, and home care. The publications relevant to US-based home care was identified by searching Pubmed, SAGE and IEEE databases. 7,423 articles were identified for screening. After examining the titles and abstracts, 30 papers were shortlisted for in-depth study and subsequent qualitative synthesis. **Results:** Top challenges are power imbalance in communication, e.g., home care clinicians sometimes lack confidence in communicating with physicians when clarifications and corrections are needed; lack of priority and attention from physicians and hospitals sharing data and/or information with HHAs, e.g., sharing patient history and medication data too late or not at all; alarm fatigue, e.g., receiving too many requests at once to respond properly; and perceiving visiting clinicians as guests e.g., caregivers not perceiving clinicians as serious medical personnel to share information. Despite the challenges, there are also opportunities: Physicians, although busy, are willing to communicate, e.g., if they are contacted in person, physicians are sharing information though not always using the electronic medium; most clinicians enjoy and would like to continue working in community settings which arguably contributes to a reduction in staff turnover and associated coordination problems; Community resources are available to home care clinicians and their caregivers to aid coordination, e.g., list of shared durable medical equipment available. The directions to leverage IT include: using online training to improve communication and coordination skills, development of a centralized portal for retrieving patient information easily on time without creating alarm fatigue, and social networks to allow caregivers and patients to find information resources. **Discussion:** This literature review revealed that the care coordination issues in home care include but go beyond implementing the IT infrastructure to enable data exchange. There are various directions to leverage IT from training to enabling access to community resources. To maximize the return on investment on IT, future studies can further investigate the nature of home care coordination problems and how to leverage IT to address those problems.



Summer Institute in Nursing Informatics 2019
Poster Presentation

eHealth Utilization Patterns by Military Health System Consumers

StephanieRaps, MSN-BC

Health care consumers in the U.S. are increasingly interacting with the health care system through electronic means (eHealth). Primary care in particular has seen a shift to eHealth by consumers under age 30, with a growing demand for routine appointments, prescription refills, and appointment booking through modes such as virtual visits, electronic health portals, and electronic messaging. The Military Health System (MHS) has implemented multiple eHealth tools for use by its consumers over the past decade, including patient portals, secure messaging, and full adoption of electronic health records. The MHS reports 70.5 million annual visits across 375 outpatient clinics, but little is known about what portion of these visits are achieved by eHealth modes and how consumers interact electronically with the MHS. Our study investigated the utilization patterns of eHealth consumers in primary care within the MHS. Methods: Retrospective analysis of the TriCare Online Patient Portal/Secure Messaging utilization metrics was completed using various regression models. We assessed the frequency and type of eHealth utilization for services such as healthcare appointments, information seeking, patient-provider communication, and prescription refills. Additionally, we examined eHealth utilization trends by TriCare Regions and differences in eHealth utilization by Military Service, age, sex, and consumer type (Active Duty, retired, dependent). Preliminary Results: Consumers affiliated with the Army use eHealth applications with greater frequency than Navy or Air Force consumers. Viewing and downloading health record data are the most used MHS eHealth functions. Non-Active Duty females between the ages of 25-35 are the highest users.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Development and Quality Assessment of a Simulation for a High-Alert Medication Intervention: A Feasibility Study

Laura Sessions, PhD, RN, CNE

Despite risk of harm from high alert medications (HAM), nurses receive little training on HAM best practices. Two HAM simulations were developed for a future RCT. A qualitative descriptive study with registered nurse participants informed the simulation design. Student nurse participants evaluated the quality of the simulations using the Simulation Design Scale and Debriefing Assessment for Simulation in Healthcare (DASH) Student Version©. Participants rated the simulations highly.



Summer Institute in Nursing Informatics 2019
Podium Presentation

Powerful Partnerships: The Practice - Informatics - Quality Continuum

JanisSmith,DNP, RN and Lacey Bergerhofer, MSN, RN-BC

Too often, information systems documentation demands cause a shift in nursing process and drive practice: an informatics example of the proverbial tail wagging the dog. A commitment to practice-driven information systems prompted the vision to create a Practice - Informatics - Quality continuum. Encouraged and supported by our Chief Nursing Executive, we have evolved structure and processes to enable the continuum. Our Clinical Practice Council is co-led by a triad of nursing leaders: a nursing department director, a nursing educator, and an expert nursing informaticist. The Practice Council codifies evidence based or best practices for patient care in policies, procedures, standard work, and job aids. Clinical staff are socialized to practice changes and updates by Practice Council representatives from their home department, through a bimonthly publication reaching all members of the nursing department, and via a quarterly webcast featuring updates to practice. Additionally, best practice is enabled with clinical decision support and documentation standards in the electronic health record (EHR). As care is documented in the EHR, staff is assisted to do the right thing with guidance provided at the point of care. When patient care is documented in the EHR, data for measuring process and outcomes metrics can be derived from the record with a variety of reporting tools. Nursing documentation is a rich source of data! At each point in the continuum the potential for feedback exists. Clinical practice drives improvements in decision support and documentation. Measurement of care process and outcomes drives improvements in documentation and changes in practice, and so forth. In this presentation we aim to share the organizational structure best supporting the strongest relationships between practice, informatics, and quality. Additionally, we will drill down on the structure, leadership, and relationships that best sustain the continuum at the committee level. We will present clinical examples of improvement in preventing hospital-acquired conditions: catheter-associated urinary tract infection (CAUTI), central line-associated blood stream infection (CLABSI), and pressure injury. Finally, we will present an operational improvement derived from EHR documentation. Assessment of readmission risk factors and providing prevention interventions have had a positive impact on decreasing hospital readmission within 30 days.



Summer Institute in Nursing Informatics 2019
Podium Presentation



Practice Podium Award Winner

Applying Predictive Analytics to Support Transitions of Care

Christine Sullivan, MS, BSN, RN-BC

Placing patients in the right bed does not end on admission, as patients' conditions change. Our facility implemented a predictive analytics tool (Rothman Index) to reduce mortality by early detection of clinical decline. Timely escalation to critical care improves the patient's chance of survival (Sankey, McAvay, Siner, Barsky, & Chaudhry, 2016). Further, monitoring the patient's trend on the Rothman Index helps to identify patients in critical care who have stabilized and are ready to be downgraded to acute care, freeing up essential resources. This same tool has been used to identify heart failure patients at risk for readmission (Banoff, Milner, Rimar, Greer, & Canavan, 2016). Through clinical integration of the Rothman Index in shift report, multidisciplinary rounds, and proactive rounding, the rate of unplanned transfers to the ICU decreased 32% as compared to pre-implementation. Rapid Response Team (RRT) calls continue to trend upward, indicating improvement in identifying clinical decline. The mortality rate trended downward in the first six months of 2018 from 2.42% to 1.86%, with the sepsis mortality rate dropping from 25.49% to 16%. The presentation will describe implementation of the Rothman Index in an urban teaching hospital with a focus on continued efforts to improve clinical integration and transitions of care.



Summer Institute in Nursing Informatics 2019
Podium Presentation



Research Podium Award Winner

Measuring Acute Care Nurses' Electronic Health Record (EHR) Use Patterns, EHR Satisfaction, and Relationship to Nurse Burnout

Donna Summers, RN MSN-BC and Julia Stocker-Schneider, PhD, RN

Significance Since passage of the HiTech Act in 2009, clinical information processes have finally become more automated through the near universal adoption of the Electronic Health Record (EHR). While information management is thought to be more efficient in this electronic environment, dissatisfaction with time spent on the computer has been expressed by nurses and other healthcare providers. Studies conducted during early EHR adoption, either found no significant difference in documentation time between EHR use and manual documentation (DesRoches, Donelan, Buerhaus, & Zhonghe, 2008; Hakes & Whittington, 2008), or longer documentation time for EHR use, but with less indirect care time spent (Banner & Olney, 2009). EHRs have evolved significantly during last decade. Therefore, studies measuring current EHR efficiencies are needed. Of concern is that poor EHR functionality leads to nurse dissatisfaction with EHRs. In a large international study, Topaz et al., (2016) found that nurses from 45 countries including the U.S. are generally dissatisfied with EHRs due to problems such as poor usability, lack of system integration, lack of interoperability, lack of standards, lack of functionality to meet clinical needs, poor accessibility, and poor training. More must be known about nurses' patterns of EHR use, and any potential relationship to EHR satisfaction and professional burnout. In a study of EHR use and satisfaction by Physicians, Shanafelt et al., (2016) identified a linkage to professional burnout. While no such connection has yet been identified in the nursing population, further exploration is warranted especially since nurses comprise the largest group of EHR end users. The purpose of this research is to explore EHR patterns of use by acute care nurses, and the relationship of EHR use to nurse satisfaction and burnout Methods A quasi-experimental cross-sectional study design was utilized. Acute care staff nurses employed in a large Midwestern health system were invited via email to complete an anonymous KLAS survey measuring EHR satisfaction EHR and burnout. Additionally, data were collected on EHR use via EPIC report tools that aggregate nurse EHR utilization data. Descriptive statistics were calculated to determine EHR use patterns, nurse satisfaction with the EHR, and burnout. Survey and use data were matched across nine inpatient units that included data from 162 acute care nurses. Spearman's correlations were conducted using the matched data to determine the relationship between acute care nurses' EHR use and EHR satisfaction and burnout. Results Acute care nurses in the study spent an average of 191 minutes in the EHR per 12-hour shift, with the most time spent documenting/reviewing flowsheets. Satisfaction with the EHR was measured at the 50th percentile overall. Interestingly, the only variable found to be correlated to nurse satisfaction with EHR was years practicing nursing; those with the most experience were the least satisfied with the EHR independent of age. Discussion/Implications for Nursing Knowledge of acute care nurse EHR use patterns, and type and extent of EHR dissatisfaction are necessary to drive EHR improvements that not only impact care quality and efficiency, but have implications for nurse engagement, and reduction in burnout.



Summer Institute in Nursing Informatics 2019
Poster Presentation

Development and application of chronic wound assessment system

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Reason and purpose A chronic wound can be defined as one that has failed to proceed through an orderly and timely reparative process to produce anatomic and functional integrity within a period of 3 months or that has proceeded through the repair process without establishing a sustained and anatomic and functional result [1]. Due to the long and varied treatment cycle, the homogenization of the treatment process and the difficulty in the preservation of the whole wound progression data are great. This procedure is designed to simplify the work process, establish the database of chronic wound assessment, treatment guidelines and wound evolution information, and achieve the homogenization of assessment and treatment. Methods We selected Bates-Jensen Wound Assessment Tool, BWAT[2] to evaluate the chronic Wound. The system was developed independently by the nursing information group of our hospital. Professor Polun Chang from National Yangming University of Taiwan was invited to teach the "User Self-Building Model", and was developed using Microsoft Excel 2016 and its internal Excel VBA tools. Results The system includes a login interface and a user interface. The user interface is divided into two user interfaces: information entry and assessment therapy. (1) Information input: When the patient comes for the first time, an electronic file is established, and when the patient comes back, the information retrieves automatically. The input of the ID number ensures the accuracy of the patient identification. (2) Evaluation and treatment: the patient's previous medical information (previous evaluation and wound pictures) was collected to evaluate the wound evolution process. According to the evaluation results, the best evidence-based treatment scheme was pushed by the database to ensure the homogenization of treatment, especially to provide work guidance for novice nurses. Discussion and conclusion The operation interface of the chronic wound assessment system conforms to the work flow of wound treatment, and the rapid retrieval and treatment guidelines of the graphic and text data ensure the accuracy of the assessment and the continuity, safety and standardization of the treatment, and improve the work efficiency and medical record management level. Provide data support for further scientific research. The next step will continue to improve this process in terms of data analysis, automation, and convenience.



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Podium Presentation

**In Basket Management: Empowering Nurses To Be First Responders For Patient Messages,
Providing The Right Care At The Right Time.**

DonesTrojillo, MSN, RN and Maia Patel, MD, ScM

Background: Patients increasingly send email messages regarding their healthcare, but not all messages require physician input. Our prior state routed all incoming message through the bottleneck of overloaded physician In Baskets, increasing response times and lowering both physician and patient satisfaction. Launching our project in August 2017 helped us meet the needs of our rapidly growing membership and achieve our operations goal to "Deliver exceptional care" and "Deliver an extraordinary consumer experience" in the Mid- Atlantic. Methods: Over 10 months, high-touch In Basket Message Management training was provided to 205 nurses in Adult and Family Medicine. Patient vignettes were used to train each new functionality, including the use of standardized SmartPhrases and QuickActions created specifically for patient message replies. We continue to follow weekly and monthly metrics, tracking "hours to first touch" for each incoming message, the percentage of messages "screened out" by nurses (messages handled to completion without any physician input), and the percent of messages researched and staged by nurses well enough that only "one touch" is required by physicians to complete the message. Results: We saw a 60% decrease in the time to first touch for all incoming messages, cutting our regional response time from an average of 22.3 hours at baseline to 8.8 hours. Addressing the goal to have all healthcare team members working at the top of their licenses, we saw a 207% increase in the number of messages able to be handled entirely by nurses, moving from a baseline screened out rate of 14%, to an average of 43% of all incoming messages screened out by nurses. Anecdotally, nurses are happier being empowered to triage and manage patients requests from the outset, and our data confirmed that some of our top-performing nurses have truly taken ownership, screening out 70% of all incoming messages. Discussion: Although we already had an optimal message pool design within KP HealthConnect, we relied on physicians to "edit in" to those pools to manage incoming messages. By redefining our regional workflows, we are better leveraging the skills of our highly trained nurses in providing more timely responses to patient inquiries. In Adult Family Medicine, we are continuously monitoring outcomes, and evaluating the staffing model to sustain this success. We have extended primary care In Basket Message Management to Pediatrics and OB/Gyn., and will expand to specialty services in our Mid-Atlantic region in 2019.



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Podium Presentation

Strategies to Address the Complexities Associated with the Assessment, Storage and Use of Social Determinants of Health in the Electronic Health Record

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Social and behavioral determinants of health (SBDH) are central to a successful population health management strategy. There are many obstacles associated with the assessment, storage and use of SBDH in the electronic health record (EHR) that include: (1) multiple, conflicting recommendations from national organizations, (2) multiple instruments with varying social-behavioral determinant domains, scoring and cut points and (3) lack of terminology code sets to store an assessment. This lack of holistic vision has contributed significantly to confusion for healthcare systems, providers and electronic health record suppliers. This presentation will describe a strategy that permits scoring by domain to create equivalency across instruments, settings and populations. The three-tier scoring strategy was designed to: (1) be used immediately at point of care by identifying potential risk for a social-behavioral determinant deficits, (2) be consumed within analytics, algorithms and for secondary analysis, and (3) produce a composite score that reflects total social-behavioral determinant burden across settings within a healthcare system. The social-behavioral determinant domain scores that contribute to the composite score would be most appropriately encoded with LOINC, the universal standard for identifying health measurements, observations, and documents. The scoring strategy supports the six uses recommended by the National Academy of Medicine (2014) and leverages the power of SBDH data in relationship to healthcare delivery.



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Poster Presentation

Sweatening Medication Processes to Flush Out High Risk Medication Errors

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Insulin for a pediatric patient is rarely prescribed in absolute dose, rather factors and ratios that require calculation of the dose prior to each administration. Heparin Flush ordering is guided by patient weight, line type and frequency of use. These factors were not included in original ordering processes, causing confusion and leaving room for errors. Previous complex processes removed the nurse from the bedside and required multiple conversations within the care team creating unnecessary burdens for all staff and delaying patient care. Through collaboration with nursing, pharmacy, & provider informatics, a solution for ordering and documenting both Insulin and Heparin was designed. These design processes include decision support for both insulin and heparin orders, safeguards for order calculation and streamlined documentation.



Value of the CCC Standard

Summer Institute in Nursing Informatics 2019
Podium Presentation

Luann Whittenburg, PhD, RN, PMP, FAAN

There is an urgent need to use a nursing terminology standard to share nursing data, to improve value-based care coordination, and to enable the transition of care management. Such a standard is needed to communicate nursing documentation in and out of hospitals as the solution for today's required interoperability legislation. This presentation will emphasize the nursing interoperability solution using the Clinical Care Classification (CCC) System in electronic Nursing Plans of Care. The presentation will highlight how standardized coded nursing terminology in electronic healthcare record (EHR) documentation systems can be used for safer transitions of care. The presentation will describe the value of a standardized terminology; the analytical value of the CCC coded data for quality indicators, and the value of the CCC to communicate the continuity of care between EHR systems in different healthcare settings. This presentation also focuses on clinical documentation improvements achieved in EHR systems using the CCC System. Nursing Informaticists will describe the coding system of the CCC and its impact in improving clinical documentation, as well as patient care quality, safety, and outcomes. They will also provide examples of how the nursing plans of care EHR data are presented electronically, processed, and generated for transmission in and out of the hospital; demonstrate their impact on care quality; and describe how to calculate nursing care workload measures. The value of the CCC as a technological solution is to calculate the work time (professional resource time) and patient care requirements for specific health conditions for a patient episode of illness. The CCC coded data retrieved and analyzed can also be used to predict work time for nurses and other health professionals as a collection of coded interactive healthcare services, interventions, or procedures. The CCC documentation codes applied to 'Severity of Illness' and 'Intensity of Service' indicators can also be calculated to determine the time and level of nursing care required by an individual patient. Once a common measure of nursing care value is established, the CCC system, known as the "ICD and CPT for Nursing" can calculate the value for each nursing service. As a nursing terminology the CCC System is recognized by the U.S. Department of Health and Human Services (HHS), the American Nurses Association, Health Level Seven (HL7), LOINC, ICNP, and SNOMED-CT. The CCC coded documentation of nursing services, simplicity of data retrieval, robust Severity and Intensity analytics and use for improved patient care coordination in interoperable plans of care demonstrate the value of this nursing technology solution standard.



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Podium Presentation

Chemotherapy Note Redesign to Decrease User Burden and Facilitate Data Retrieval

Monica Wilt, RN, BS; Barbara Van de Castle, DNP, RN; and Allen Chen, MD, PhD, MHS

All medical records require concise, clear notes for all readers of the note to obtain a working knowledge of patients' needs. Not all medical records have these concise, clear notes. This comprehensive cancer center is one of the few that has required a chemotherapy treatment note for every regimen. This practice is compliant with the 2016 ASCO/ONS Chemotherapy Administration Safety Standards requirements. The note is used to check each dose of chemotherapy as the patient undergoes treatment that includes the most toxic medications that exist, generally in complex cyclical regimens. Careful, independent double checks by each discipline involved in providing this type of treatment is necessary to prevent harmful errors, but requires additional documentation tools. Our initial electronic chemotherapy treatment note was created in 2014 when we implemented a new EHR. In its rudimentary form, there were many challenges and workflow concerns. It was cumbersome to navigate, tracking signature status was difficult, there were no discrete data for reporting purposes, it was unavailable during downtime, and it did not guide providers to comply with our policy. Prior to the redesign of the chemotherapy treatment note, there were multiple examples from pharmacists and nurses of confusing signatures and note content as modifications were made to the plan. It became apparent that we needed to redesign the note. The redesign goals included: improving usability; ensuring unambiguous note content and signature tracking; providing a framework to track modifications; facilitating review of note by disciplines responsible for dispensing and administering chemotherapy; providing access to content during downtimes, and, providing discrete data for reporting purposes. Since implementation of the redesign, the reported issues have decreased. A human factors engineer performed observations and time studies. The analysis showed that users were able to access the new note within seconds and with only a few clicks. All users reported enhanced clarity with the content and signature tracking. During a downtime, we are now able to administer chemotherapy and remain compliant with our policy. Every field of the new note is discrete, giving us the ability to report on all data points in the note.



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Podium Presentation

Improving Care Transitions with Innovative Technology and Health Services Research: A Journey through AHRQ's Health IT Portfolio

Derrick Wyatt, MSc., RN-BC, CPHIMS

Transitions of care are the movements of patients between providers or clinical settings which typically occur when primary care providers refer patients to specialty care, or when patients are discharged from the hospital to subsequent care settings. During care transitions, critical information aimed to improve the patient's condition and health outcomes needs to be accurately communicated and coordinated between health professionals, the patient, and the family to ensure that safe, high-quality care is provided and care continuity is maintained. Poorly managed transitions can lead to costly, unsafe, and low quality health care. The Centers for Medicare & Medicaid Services (CMS) notes that Medicare patients typically experience multiple provider transfers during post-acute care at a cost to the U.S. health care system of approximately \$15 billion per year (CMS, 2018). In particular, people with multiple chronic conditions (MCC) undergo many care transitions across settings and providers and are particularly at risk for avoidable adverse events during these many transitions. MCC patients are high cost, high need patients that account for 65% of health care spending and mitigating their risks during care transitions has the potential to greatly reduce care costs and improve care quality. Additionally, uncoordinated care transitions result in unneeded stress and burden on patients and caregivers as well as considerable burden on clinicians who don't have the necessary information to deliver high quality care and must expend a great deal of effort to obtain this information. Health IT has the potential to improve care transitions by enhancing communication and coordination, thereby reducing duplicate services and mitigating adverse events. Technology can facilitate an integrated multi-disciplinary approach to improving care by defragmenting information, improving communication, and assuring the care team and other stakeholders have access to reliable and complete health information that may be located in other care settings or disparate systems. Additionally, health IT has the capability to empower providers, patients, and caregivers in sharing the responsibility of improving health outcomes while reducing adverse events and costs. The Agency for Healthcare Research and Quality (AHRQ) is committed to improving the safety and quality of America's healthcare system and recognizes that technology can be leveraged to achieve the goal. This presentation will provide an overview of AHRQ's Health IT Research portfolio, discuss a selection of funded research projects that are aimed to improve care transitions through the use of innovative health IT solutions, and provide information on available AHRQ funding opportunities that support research that focuses on the use of health IT to improve care transitions.



Summer Institute in Nursing Informatics 2019
Poster Presentation

To measure the informatics competency of clinical nurses in medical centers of Fujian, China

Lijuan Yan, RN

Objectives: A validated home-made model of nursing informatics competency for clinical nurses was used to measure the current status of informatics competency for clinical nurses in the medical centers of Fujian, China, which sits across Taiwan Strait with a population of 37.9 million people and ranked as 10th wealthy province in terms of GDP in China. **Methods:** Six medical centers from three metropolitan cities, Xiamen, Quanzhou and Fuzhou, were randomly selected and 652 nurses were further randomly selected for online survey. The home-made model of informatics competency model was developed in 2018 by acquiring knowledge from six experienced informatics nurses of medical centers, benchmarked in hospital EHR and Nursing Information System, in Mainland China and Taiwan. It is composed of 37 attributes, such as Use of Productivity Software, Familiarity with NIS Operation, Doing Scientific Study, etc., out of three categories, Computer Skill, Application Skill, and Information Skill. Purpose and contents of survey were explained to the subjects by same well trained staffs. 5-point Likert scale was used as scale, 5 Very Competent and 1 Very Incompetent. Survey was made anonymously. **Results:** Overall, the average scores for the Computer Skill, Application Skill, and Information Skill are 2.7(SD 0.67), 3.14 (0.63), and 2.93(0.64). Subjects did not feel enough competent in all three dimensions but relatively, felt better in Application Skill and more incompetent in Computer Skill. In terms of individual items, the top ten more competent attributes are (1) to Secure Patient Safety 3.99, (2) Implementation Capacity 3.63, (3) Knowledge about Productivity Software, (4) Knowledge about Communication Terms 3.27, (5) Nursing Informatics Education 3.22, (6) Information System Functions and Structures 3.2, (7) Information Security 3.17, (8) Information Strategies and Policies 3.14, (9) Acquisition of Information and Use 3.14 and (10) Informatics-based Problem Solving Capability 3.13. On the contrary, the top most incompetent attributes are (1) Programming 1.97, (2) Interface Design 1.99, (3) System Development 2.28, (4) Selection of Quality Hardware and Software 2.39, (5) Website Skill 2.44, (6) Computer Terminology 2.58, (7) Hardware and Software Operation and Maintenance 2.64, (8) Assessment of Development Environment Capability 2.69, (9) Data Acquisition Technique 2.7, and (10) Nursing Information System Development Policies 2.73. **Discussion and Conclusion:** It is not a surprise that overall, nurses felt not very competent in nursing informatics. Among categories of informatics capabilities, relatively, nurses showed most competent in application skill and most incompetent in computer skill. The former capability is more related to nurse's nature of problem solving and high implementation capacity. The results showed we need to enhance the informatics competency for our nurses, especially in computer skills such as programming and system development. **Key words:** nursing informatics competency survey, nursing informatics competency, computer skill, application skill, information skill



Summer Institute in Nursing Informatics 2019
Poster Presentation

A Comparison of Quality Improvement Needs in Urban and Non-urban Home Health Agencies: Facilitating Decision Making by Leveraging Data Analytics

YiliZhang, PhD; and Urmita Banerjee; and Gunes Koru, PhD

Introduction: Comparisons of urban versus non-urban home care traditionally examined access to care. Additional quality dimensions, however, have captured widespread attention as the Centers for Medicare and Medicaid Services (CMS) used them in the recently piloted value-based purchasing (VBP) model expected to be in effect by 2022. Organizational quality initiatives in home health agencies (HHAs) and the plans for rewards, penalties, and targeted incentives within VBP can benefit from an understanding of the improvement needs in urban and non-urban HHAs. Accordingly, this study leveraged data analytics to highlight the similarities and differences between the two groups. Methods: The quality measures were obtained from the Medicare Home Health Compare Database for each HHA within the following three categories: 1) Twelve rates indicating adherence with clinical processes 2) Seven rates indicating attainment of desirable clinical outcomes, and 3) Two rates indicating utilization outcomes, which are, unplanned emergency room (ER) and hospital admission rates. Each HHA was placed into either urban or non-urban group based on the classification of agency zip code in the Rural-Urban Commuting Codes database. Within each HHA group, each quality measure was ranked within its category of measures according to the median and mean values of the measure calculated by considering all HHAs in the group. The first and last ranks were assigned to the most and least desirable rates, respectively. Mann-Whitney U-test was used for comparing urban and non-urban HHAs with respect to a given measure. Results: In Category 1, treating patients for pain ranked the second among urban HHAs but the fifth among the non-urban HHAs; checking for depression ranked fourth among urban HHAs but seventh among non-urban HHAs; checking for fall risks and treating heart failure symptoms were among the top three in both groups; the lowest five compliance areas were the same for both groups with the same ranking orders, which were checking for pneumococcal vaccination, starting care in a timely manner, teaching patients about drugs, foot care for patients with diabetes, and prevention of pressure sores. Non-urban agencies were better in starting care timely and checking for pneumococcal vaccination but urban HHAs were better in teaching patients about drugs. In Category 2, improvement in wounds was the best outcome area in both groups. Going from the worst to best, within both groups, improvement in taking drugs was followed by getting in and out of bed, walking and moving around, and breathing. Non-urban HHAs were better in helping patients getting in and out of the bed and taking drugs. Urban HHAs were better in reducing pain and better in obtaining improvements in bathing. In Category 3, hospital admission rates for were higher than ER admission rates for both groups. Urban HHAs achieved better utilization outcomes. Conclusion: There exist both similarities and important differences between urban and non-urban HHAs to be considered in policy and quality-improvement decisions. Future data analytics studies can further explore the associations between quality and various socioeconomic factors.