Summer Institute in Nursing Informatics 2014

HIGHLIGHTS AND AWARD-WINNING PEER-REVIEWED ABSTRACTS

Informatics Enabling Patient-Centered Care Across the Continuum

JUDY OZBOLT, PhD, RN, FAAN, FACMI, FAIMBE
VISITING PROFESSOR AND CHAIR, SUMMER INSTITUTE IN NURSING INFORMATICS, UNIVERSITY OF MARYLAND SCHOOL OF NURSING

Hundreds of nurses and other informatics professionals convened in Baltimore, July 16 to 18, for the University of Maryland's 24th Annual Summer Institute in Nursing Informatics (SINI), while dozens more followed the proceedings live via Web streaming. With support from sponsors ESD Consulting and HIMSS, this year's SINI described new roles for clinicians and informaticists in using informatics tools to support patient-centered care across settings. In addition, experts in two think-tanks conducted during SINI explored ongoing challenges in interoperability and data analytics, focusing particularly on issues arising from patient-generated data and health information exchange across settings.

National leaders in health informatics filled plenary sessions with a set of distinguished lectures. In the opening keynote address, Philip Fasano, executive vice president and chief information officer, Kaiser Permanente, described online tools that Kaiser members may use to manage their health and communicate with their providers.

Martin Kohn, chief medical scientist, Care Delivery Systems, Jointly Health, opened day 2 with a discussion about big data and clinical decision support. Later in the day, participants had the opportunity to hear a follow-up presentation by Eric Siegel, professor, University of Maryland School of Medicine, about what must happen before Watson, IBM's super computer, can support bedside care.

The focus shifted from big data to personal health management in a presentation by a representative of the Office of the National Coordinator for Health Information Technology (ONC). Ellen Makar, senior policy advisor, described initiatives ONC is undertaking to help individuals and families engage in reaching their health goals through the use of computer-based and mobile health applications.

Molly McCarthy, chief nursing strategist, Microsoft Health and Life Sciences, opened day 3 by telling participants about new Microsoft initiatives in healthcare and personal health management.

Finally, Patricia Flatley Brennan, professor of nursing and industrial engineering, University of Wisconsin–Madison, gave the endnote address, inviting participants to look at emerging technologies that will transform both the delivery of healthcare and personal health management.

Interspersed with the distinguished lectures were 34 invited and peer-reviewed podium presentations offered in concurrent sessions. An additional 27 peer-reviewed poster presentations sparked lively discussions during the poster session.

Participants also enjoyed networking at the Exhibitor Evening. In addition to the showcase of products and services aimed at nursing informatics, participants met the authors of popular nursing informatics texts at a book signing and got acquainted with colleagues they had been following on Twitter at a Tweet Meet.

The essence of SINI remains the quality of the content, the expertise and generosity of the presenters, and the collegiality of the participants. We were honored to receive a large number

of excellent abstracts. Abstracts were carefully reviewed and scored by the 16-member planning committee, and awards were given to the highest-rated abstracts for poster and podium presentations in the categories of research and practice. In addition, attendees at the poster session voted for a People's Choice award.

The award winning abstracts are presented below.

OUTSTANDING PODIUM-RESEARCH

Successful IT Initiative to Reduce the Rate of Excessive Uterine Contractions During Labor

KARI BUNTING, MS, RNC-OB,C-EFM
SAMUEL SMITH, MD
EMILY HAMILTON, MD

Introduction/aims: Oxytocin, an effective drug to increase the rate and strength of uterine contractions, is used in more than half of all labors. Intravenous infusions are adjusted frequently at the bedside because the uterine response can vary greatly. Clinical protocols recommend discontinuing oxytocin in the presence of overly frequent contractions because they can decrease oxygen delivery to the fetus and result in brain injury. Despite well-established guidelines, incautious use of oxytocin is reported in 45–71% of births with severe asphyxia and subsequent litigation. In 2011 Medstar Franklin Square Medical Center introduced specialized obstetrical software (PeriCALM Patterns V2.01 PeriGen, Cranbury, NJ) with electronic fetal monitor (EFM) pattern recognition and display features specifically designed to assist in the prompt recognition of uterine tachysystole. Uterine tachysystole (UT) is defined as the presence of more than 5 contractions per 10 minutes, averaged over a 30-minute period. The objective of this study was to compare the rates of UT in the periods "Before" and "After" the introduction of this software in women with induction or augmentation of labor.

Methods/process/procedures: Inclusion criteria were labors with live singleton cephalic-presenting babies at term with EFM recordings. The "Before" group comprised 6728 births (3869 with induction or augmentation) from February 2006 to February 2010. The "After" group included 3790 births (1988 with induction or augmentation) from January 2012 to December 2013. Induction or augmentation status was ascertained by automated review of the electronic medical record database searching for evidence of interventions or oxytocin use to induce or enhance labor. Each EFM record was analyzed by PeriCALM Patterns software to determine contraction counts in 30 minute segments.

Results: As a result of early detection and prompt remediation, very substantial reductions were observed in a variety of UT-related measures. In women with induction or augmentation the rate of tachysystole fell from 22.7% to 17.3% (p<0.0001). When UT did occur, the average duration fell from 64 minutes to 54 minutes (p=0.0039). In those who experienced UT, the total percentage of time spent in UT decreased by 36.5% over the course of this study (p<0.0001). There were also decreases in the percentages of babies with severe neonatal depression, but the small numbers precluded statistical significance.

Discussion/outcomes: This is the first report of a large and systematic review on the effect of efforts to reduce uterine tachysystole. We observed a very substantial and sustained reduction in both the incidence and duration of UT in patients with augmentation or induction of labor. The 36.5% reduction in the total percentage of time spent in UT reflects a marked changed in clinical behavior. We attribute this marked improvement to the coexistence of several essential factors present in IT initiatives that actually change behavior: 1. Objective computations at the point of care that are personalized to the individual patient; 2. Continuous trend analysis and feedback showing the patient's situation related to expected norms; 3. Clearly established clinical policies regarding expected therapeutic actions; 4. Active quality improvement follow up.

OUTSTANDING PODIUM-PRACTICE

HRSA-ONC Beacon Program to Improve Quality of Health Care for Community Health Centers Through the Use of Health Information Technology

ANNA POKER, RN
SUMA NAIR
EDWIN LOMOTAN

Introduction/aims: The Health Resources and Services Administration (HRSA), an agency within the U.S. Department of Health and Human Services, is the primary federal agency for improving access to health care services for people who are uninsured, isolated, or medically vulnerable. HRSA achieves this mission through 1,128 health centers (HCs) that represent over 8,500 sites nationwide serving over 20 million of the uninsured and vulnerable patients. In September 2011, HRSA awarded $8.5 million to 85 HRSA funded HCs located in 15 of the 17 Beacon Communities throughout the United States. These funds, made available through HRSA under the Affordable Care Act (ACA), help support HCs with the adoption, implementation, and use of health information technology (health IT) to support long-term improvements in quality of care, health outcomes, and cost efficiencies. This effort also supports HCs to exchange health-related patient information with their geographic Beacon community according to nationally recognized standards in a manner that protects the confidentiality, privacy, and security of the information.

Methods/process/procedures: Eligible applicants were sent the funding announcement with instructions on how to apply. Grantees provided interim and a final progress report that were qualitatively and quantitatively summarized. Sections about types of interventions, collaboration partnerships, and quality improvement (QI) initiatives were quantitatively reviewed. Sections on lessons learned and challenges were organized into domains closely resembling the ONC Beacon Program required elements for successful data exchange.

Results: Grant funds were used for a variety of interventions that supported Meaningful Use (MU) reimbursements, for Patient Centered Medical Home (PCMH) recognition, and for advancement toward QI initiatives. HCs also developed new collaborative partnerships.

The most common collaborative partnerships (in addition to their Beacon Community partners) were the Regional Extension Centers, local hospitals, other HCs; and health center controlled networks.

Discussion/outcomes: HRSA-funded HCs are working hard toward modernization and transformation of health care delivery for the vulnerable and underserved populations they serve. We found that health centers were dealing with cross-cutting issues that extend across multiple domains of QI while needing to meet multiple competing demands in serving their populations. The federal government can best support this effort by providing HCs with tools and resources, to let them resolve their own challenges. Just as there are many roads that can lead to a destination, there is no one path that is right for all. HCs will identify their own best path toward using health IT to improve health care.

UDS 2012 data http://www.healthit.gov/policy-researchers-implementers/beacon-community-program

HRSA Beacon Funding Announcement at: http://www.hrsa.gov/grants/apply/assistance/beacon/

http://www.hibeacon.org/images/BeaconNation/Beacon_Nation_Learning_Guide_ADT_Feeds_Final.pdf

OUTSTANDING POSTER-RESEARCH

Usability Testing and Comparison of Six Electronic Nursing Record Systems: User-Task-System Evaluation

INSOOK CHO, PHD
WON JA CHOI, MS
WOAN HEUI CHOI, MS

Introduction/aims: Nurses are rapidly converting to electronic nursing records (ENRs) due to the political, financial, and social needs both within and outside hospitals, and it is hoped that key quality benefits will be obtained from their adoption. Usability factors are a major issue for health information technology adoption, but little is known about the usability of ENR systems. The purpose of the study was to understand and determine the usability of ENR systems in terms of their efficiency and effectiveness.

Methods/process/procedures: The usability of a user-task system for laboratory function was evaluated. Six hospitals that have used different ENR systems (including narrative nursing records) for more than 3 years were recruited for this study. They were all academic tertiary hospitals in Korea with more than 1,000 beds and their own, self-developed ENR systems. Nine nurses from internal medicine wards, surgical wards, or intensive-care units were randomly selected from each hospital. Three paper-based clinical scenarios (appropriate to the ward/unit) and scoring criteria developed by the researchers were used. The 54 nurses were asked to imagine that they were taking care of a patient and to create a narrative nursing note with the hospital's ENR system. They were also asked to vocalize what they were thinking while using the system. The user-system interactions were recorded digitally, classified into three categories, and scored by two researchers as follows: +1 (optimal), 0 (correct, but not optimal), and 1 (incorrect or failure).

The scores were used to calculate the efficiency (the ratio of summing the total number of positive entries divided by the total number of all entries made), effectiveness (the ratio of the number of points earned divided by the maximum number of points), and competency index (combination of the efficiency and effectiveness scores into one index). The time taken to complete the task was also measured. Data were collected between June 2013 and October 2013 after acquiring permission from the institutional research review board at each hospital. Descriptive statistics and variance analysis were used to compare the systems.

Results: The mean number of entries was 12.4 sentences (range, 5–22 sentences). The overall efficiency of the six hospital ENR systems was 94.2% (95% CI, 91.4–96.9%; range, 84.3–99.3%). The differences between the systems were statistically significant (2=12.3, P=0.030). The mean effectiveness was 60.6% (95% CI, 54.3–66.8%; range, 42.8–66.6%). The competency indexes ranged from 42.4% to 50.0%, and the mean index was 47.4% (95% CI, 46.0–48.8). The nurses took a mean of 317 sec (95% CI, 273.7–360.8 sec) to complete the task; the time taken ranged significantly according to the system, from 226.3 to 457.2 sec (2=11.2, P=0.048).

Discussion/outcomes: The six ENR systems exhibited a high degree of efficiency and moderate-to-low effectiveness in terms of usability. Improvements in the quality of data entry are required for all of the six tested systems. Several of the systems require efforts to improve their efficiency and the user-system interactions to reduce the time required to complete a narrative nursing record.

OUTSTANDING POSTER-PRACTICE

Improving Depression Screening Using CDS and Patient Access to Information Using PHRs

CRISTINA MAHABIR, MS, RN
GILAD KUPERMAN, MD, PHD
RUBEN LANTIGUA, MSN, RN
NEBOJSA MIRKOVIC, PHD, MPH

Introduction/aims: Depression as a co-morbidity alongside another chronic disease often complicates the patient's ability to adhere to medical treatment. Patients with diabetes are twice as likely to have depression. Inconsistent screening for depression can lead to missed diagnoses and adversely impact the patient's treatment course. The aim of this project was to increase the diabetic population's rate of screening for depression using Clinical Decision Support (CDS) tools and alerts. These tools prompt the clinical care team to use a standardized Patient Health Questionnaire (PHQ)-2 depression screening tool and PHQ-9 for depression symptom level assessment. Further aims included improving the patient's awareness about depression and access to resources regarding diagnosis and treatment.

Methods/process/procedures: The area of focus for this project includes New York-Presbyterian Hospital's Ambulatory Care Network (ACN), which has adopted the National Committee for Quality Assurance's patient-centered medical home (PCMH) model. Diabetes

and depression were identified as two of four conditions to be targeted during the first stage of implementing the PCMH model. A clinical workgroup comprised of primary care and mental health physicians at NewYork-Presbyterian hospital developed a clinical standard of care to identify the conditions, intervals, and frequency in which depression screening and assessment should occur. Structured PHQ-2 and PHQ-9 forms were embedded within appropriate flowsheets and documents in the Electronic Health Record (EHR). The standard of care was used as a roadmap for the technical development of a Medical Logic Module (MLM) or programming code built within the EHR. The MLM triggered CDS alerts that were presented when depression screening process conditions were met. These conditions included: annual PHQ-2 screen; administration of a PHQ-9 with a positive PHQ-2 screen; provider notification for a PHQ-9 score $\geq$20, or for any patient response other than "not at all" to question #9 ("thoughts that you would be better off dead, or of hurting yourself in some way"). NewYork-Presbyterian Hospital's Personal Health Record (PHR), myNYP.org, was updated to include printable PHQ forms. Resources for treatment and education regarding depression screening, diagnosis, and treatment were also incorporated into myNYP.org.

Results: A data analytics tool was used to capture the diabetic PCMH population's depression screening rates six months pre-implementation (June 2012) then again six months post-implementation (June 2013). Post-implementation, these data indicated an 8% increase in the number of patients screened for depression using the PHQ-2 (from 16 to 24%) and a 7% increase in the number of patients with a positive PHQ-2 who received a follow-up PHQ-9 assessment within 4 weeks (from 53 to 60%).

Discussion/outcomes: CDS alerts have the potential to improve the rate of screening for depression. Offering the patient resources for depression in a PHR provides real-time tools that can be beneficial, outside of the hospital setting. There is potential to further automate PHQ data entered by the patient. Lessons learned in this project include challenges with consuming patient-entered data into the EHR. Other considerations include workflow issues and technical alerts for the care providers if patients enter PHQ data that should trigger an immediate response.