Practice Poster Award

Secure Messaging Application: A Heuristic Evaluation

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

Abstract

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

What factors predict Fitbit adherence in Stroke and Parkinson disease?

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

Abstract

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

The Characteristics of Pressure Injury Photographs from the Electronic Health Record in Clinical Settings

Dan Li, Ph.D, RN
Co-presenter: Carol Mathews, WOCN, RN

Abstract

Aims: To analyze and understand the characteristics of images of pressure injury (PI) (formerly called pressure ulcer) stored in electronic health records (EHR). **Background**: To improve the quality of PI documentation, photographing PIs and storing the images in the EHR is accepted practice in many hospitals. Clinical decisions regarding the progress and treatment of PI often rely on the information presented in PI images. As new technologies develop, image processing and computer visualizion can make possible the automated measurement of PI size and wound tissue segmentation. However, most research in this area deals with strictly controlled conditions for PI images that are confined to the wound region only. Translating these technologies to PI images taken in clinical environments faces the challenges of controlling the complex photographic conditions and of the lack of standardization of wound photography. In this study, PI images stored in an EHR were reviewed to analyze the characteristics of PI photography in clinical settings. Through better understanding of those characteristics, we expect to help image processing experts shorten the gap between laboratory and clinical environments when translating these new image processing technologies. Moreover, we studied possible approaches to designing a standardized wound photography protocol for clinical environments. **Design**: An observational descriptive study. **Methods**: Copies of a set of 289 PI images were obtained from a western Pennsylvania hospital. The original images were stored in the wound care documentation component of the EHR. The original PI images were taken by the wound care nurses in clinical settings during daily wound care service. In this study, those images were reviewed one by one by researchers to analyze their characteristics, including the relative position of the PI in the images, the shooting angle of the digital camera, inclusion or exclusion of clinical background materials and their colors,and any materials contaminating the wound surface**. Results**: Of all the PI images, only 6% were confined to the wound region only. Clinical background including clothes, bed sheets and gown existed in 94% of the PI images. In 91% of the images, the PI was presented in the central part of image. In 24%，white powder or lotion covered part of the PI surface. The digital camera lens was not oriented parallel to the plane of the PI in 46% of the images. There were no PI images in the sample that met the strictly controlled image conditions required for commercially available image processing tools for PI segmentations. **Conclusions**: The findings of this study indicate that a digital photograph of PI may increase the accuracy of the assessment and documentation. To extract the wealthy information from PI images through novel image processing technologies, developers must consider the characteristics of PI images in clinical settings. Furthermore, clinicians require a standardized PI photography protocol to assure the accuracy and objectivity of PI recording. The standardization of PI photography may increase utilization of new technologies like computer visualization and telemedicine.

Evaluation of continuous multi-parameter surveillance monitoring, a wearable medical device, on code blue/treat team events for medical-surgical floor patients.

Tonya Judson, RN
Co-presenter: Ada Holyfield, MSN, RN

Abstract

Background: The use of continuous multi-parameter surveillance monitoring (CMSM) fosters early recognition of deteriorating vital signs with data trends, prompting clinical intervention to promote patient safety and decrease failure to rescue events. CMSM monitors a patient's heart rate, blood pressure, oxygen saturation, respiration and skin temperature. The CMSM real-time data transmits wirelessly to the electronic health record (EHR) and to a remote viewer display (RVD) at the nurses' station. Vital signs that fall outside safe parameters alert the nursing staff at the RVD and their mobile handheld device, prompting intervention. The CMSM communicates through Wi-Fi, allowing monitoring of a patient while in the room, on the unit, or during transport throughout the hospital. Additionally, the CMSM unit is a wearable medical device, facilitating patient mobility. For this study, a large, southeastern, suburban hospital utilizes CMSM on their medical-surgical floor. **Objective:** The aim of this study is to examine code blue/treat team events for non-CMSM and CMSM medical-surgical floor patients to determine if CMSM improves patient outcomes. **Methods:** A retrospective study was conducted by reviewing the hospital's code blue/treat team logs and comparing the data to the EHR, ascertaining CMSM device usage. Outcomes were noted for both non-CMSM and CMSM patients that experienced a code blue or treat team event on the medical-surgical floor. Staff education procedures were also evaluated by comparing current education practices with the recommended vendor-supplied educational tools. **Results:** The CMSM patients had an overall decrease of code blue/treat team events, a decrease in patients being transferred to a higher level of care post an event, as well as an increase in patients remaining on the unit post an event versus non-CMSM patients. Further review revealed instances of incorrect usage of the CMSM device, possibly contributing to failure to rescue events with the CMSM patients. Review of the staff education practices revealed a lack of formalized training for new hires, non-usage of the vendor-recommended instructional videos and clinical skills checklist, as well as an outdated CMSM policy and procedures manual. **Conclusions:** It appears that CMSM of medical-surgical patients improves patient outcomes. A formal CMSM device training program, as well as ongoing staff education of correct CMSM device usage could continue to improve patient outcomes and decrease failure to rescue events.