

Using Evidence-Based Nursing Practices and Electronic Health Record Decision Support to Reduce Fall-Related Patient Injuries in Acute Care

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Summary: Advances in health information technology (IT), particularly the use of clinical decision support systems (CDSSs) in electronic health records (EHRs), hold great promise for enhancing the safety, quality, effectiveness, and efficiency of patient care. However, limited use of these advances by nurses has been reported. Many nurses continue to develop, implement, and document their care plans on paper with little automation, limited access to CDSS, and manual abstraction for quality reporting. Research is needed on how, when, and where CDSS can be used to increase quality and patient safety for acute-care nurses.

This project was a collaboration between investigators at Aurora Health Care System Nursing Research, the University of Wisconsin-Milwaukee Colleges of Nursing and Health Sciences, and the Cerner Corporation. The research team added new tools to an existing CDSS within an EHR to help nurses individualize care for groups of patients and improve fall and injury prevention processes and outcomes. The team used evidenced-based recommendations and input from academic partners and experts in fall prevention, technology acceptance, and cost-benefit analysis to develop a data dictionary, qualitative and quantitative assessment measures, and CDSS design.

The project was implemented with nurses who worked on two medical or telemetry nursing care units in one large urban medical center. The facility had a pre-existing EHR with fall prevention and injury management data elements, electronic care planning functionality, and CDSS tools that identified fall and fall-related injury risks using data entered during patient care. This CDSS project involved the creation of two new electronic report tools for nurses. One report tool used a dashboard to display the status of risk assessment, planned interventions, and outcomes to support nurses to evaluate and adjust their fall prevention care plans for individuals and groups of patients at a key point in their workflow. The other report tool displayed retrospective data about fall prevention care and fall event details that unit-based nurse leaders could use to monitor their results and tailor their quality improvement efforts. In addition to creating the reports, the team developed patient and family education materials, staff and nurse leader education materials, and a data dictionary of standardized terminology. A pre/post mixed-methods design, including data queries, direct unit observation, focus groups, surveys, and usability testing was used. Qualitative and quantitative measures were used to identify recommended tool content and logistical design, and evaluate post-implementation outcomes.

Evaluation results were disseminated to key clinical and informatics leaders to influence future work in this area. The data dictionary, support tools, findings, and lessons learned will contribute to the available knowledge of improvements in patient safety and quality of IT-supported nursing care, and help reduce CDSS development and implementation costs.

Project Objective:

- Design, build, and implement CDSS tools that were populated with data extracted from the EHR and to evaluate if the CDSS tools could support nurses to improve care planning and quality improvement activities, and patient or family education related to fall prevention in acute care. **(Achieved)**

2011 Activities: The focus of activity was on developing a final report for the study. The project was completed in January.

Impact and Findings: Despite providing input into design, the nurses and nurse leaders were slow to adopt the tools. The dashboard that displayed the status of risk assessment, planned interventions, and outcomes used an EHR-provider based template and was accessible in the EHR with a single click. The tool functioned as designed with a clean visual display but did not provide enough detail about patient-specific risks and interventions to be considered useful. Prolonged load time was a significant barrier to regular use during report and patient care.

The retrospective data about fall prevention care and fall event details required the use of an EHR-provider template with significant customization. The tool populated accurately and comprehensively, bringing rich data about fall prevention and fall events including externally reported quality indicators without manual abstraction. Usability testing showed that nurse leaders could access the tool and believed the tool brought disparate data together, saving time and improving data quality. The nurse leaders reported competing priorities and found no time to use the tool during the evaluation period.

Similarly, staff nurses provided positive feedback about the patient and family education materials, but there was limited evidence of use during the post-implementation period.

This study demonstrated that nurse-sensitive data, embedded in the EHR, can be captured and extracted from the data repository to create tools that support decisionmaking during patient care, and for retrospective aggregate analysis and quality improvement. However, the CDSS tools were not adopted as widely as expected. Sociotechnical context issues such as time constraints, competing EHR implementations, and resource reduction were observed during training, go-live, and adoption periods that may have influenced adoption. Sociotechnical context is not typically captured in CDSS research. Gathering these details provides information and insight into factors that influence the adoption and use of technology beyond the technical aspects.

Transitioning to evidence- and data-driven processes may require a new understanding about how nurses adopt and use electronic tools to support decisionmaking. Despite limited adoption, this study sheds light on the complexities of nursing workflow, sociotechnical context issues that influence adoption, and factors to consider in future research on CDSS tools and nurse decisionmaking.

Target Population: Adults

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.

Business Goal: Implementation and Use
