Reducing Medication Errors

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PROJECT DESCRIPTION: This project focuses on systematic analysis and reduction of medication errors The goals are to identify potential interventions for error reduction: 1) Identify practice variation for potential standardization; 2) Identify error-prone processes; 3) Determine interventions and mitigation strategies; and 4) Transform organization practice and develop a culture of continued improvement.

PROGRESS TO DATE: Data collection of process times and error rates for high alert medication administration process and medication dispensing process were carried out at the hospital units followed by error analysis. These data were incorporated into a simulation-optimization decision model, and the mechanism of error propagation across stages was observed. The analysis has facilitated the following: 1) Identification of major error types based on historic data and the causes of occurrence; 2) Intervention design based on point-of-error occurrence and impact on the entire workflow in the long run; 3) Identification of procedural changes observed during time-motion study that helps in standardizing and safe-guarding the medication flow; 4) Understanding process interdependencies and the mechanism of error propagation within the system; and 5) Validating and evaluating the effectiveness of proposed interventions (potential error reduction of 50%). We will next develop a decision support system fr the hospital administrators incorporating all the stages of the medication process. This will enable them to perform what-if analysis on procedural changes and understand their impact on mitigating error occurrence rates. We are also exploring reducing medication errors through the use of EMR and in other hospital sites.

HOW THIS PROJECT IS DIFFERENT: Prior research mainly focused on medication error analysis of a single step of a process sequence (e.g. Dispensing stage of the medication flow). Our project provides a comprehensive analysis of the entire medication workflow from prescribing to administering. This enables us to understand the complexities of individual steps in the process sequence as well as process interdependencies. Further, the decision support system in development will represent the entire workflow, and thus will provide a holistic view of impact of procedural changes in mitigating medication errors.

POTENTIAL BENEFITS:

- Analysis of present standards in terms of quality and effectiveness of medication workflow
- Tool for medication error analysis based on causes, types and impact on patient safety
- Process standardization based on recommendations from time-motion study and simulation resultsw
- Framework for testing process modifications without actual implementation and long term impact
- Effective strategies and interventions for error mitigation and improved quality of care
- Introduction of concept of systems and cultural transformation

This material is based upon work supported by the National Science Foundation under Grant No. IIP-0832439. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily wreflect the views of the National Science Foundation.