Project Title:	A Systems Engineering Approach: Improving Medication Safety
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Organization:	State University of New York at Buffalo
Mechanism:	RFA: HS07-006: Ambulatory and Safety Quality Program: Improving Quality through Clinician Use of Health IT (IQHIT)
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Project Period:	09/07 – 08/10
AHRQ Funding Amount:	$1,200,000
Summary Status as of:	December 2008

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve the quality and safety of medication management via the integration and utilization of medication management systems and technologies.

Business Goal: Synthesis and Dissemination

Summary: This project was initiated in September 2007 and has completed the first third of the grant period. This project implements an information technology (IT)-based Crew Resource Management (CRM) tool in a primary care setting. The selected IT system that is being adapted (with CRM elements embedded) for this study is the A Collaboration of Resources Network (ACORN) system developed by the Dendress Corporation for facilitating quality improvement teams in hospital settings. The modified system, ACORNoffice, was completed and alpha-tested within the first 6 months of the project. This project was formulated in consultation with Upstate New York Practice Based Research Network (UNYNET) clinicians who are already using electronic medical records (EMRs) and are interested in identifying affordable approaches that are useful and generalizable to their practices. The project is an experimental design (single-blind randomized block cluster) of a site-level intervention. Outcome assessment will be focused on medication safety among geriatric patients and on office staff use/application of the IT-based CRM tool. Participatory research methods will be used to assess provider- and staff-identified barriers to implementation. The overall purpose of this study is to conduct and publish the results of an IT demonstration project using a human factors approach to geriatric medication safety so as to provide pilot data for larger confirmatory studies and perhaps to develop and market test the IT-CRM software via Small Business Innovation Research (SBIR) mechanisms for eventual national release.

Specific Aims

- Examine the impact of an IT-based CRM intervention on reducing selected adverse drug events (ADEs) among geriatric patients in primary care settings by evaluating changes in: 1) number of preventable ADEs that occur, 2) severity of those ADEs, and 3) stage of the medication use process in which they occur (i.e., diagnosis, prescribing, transcribing, dispensing, administration, and monitoring). **(Ongoing)**
- Examine the impact of an IT-based CRM intervention on improving monitoring for geriatric patients on persistent medications in primary care settings by evaluating changes in monitoring rates for subjects (age 65 and older) on: 1) angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs), 2) digoxin, 3) diuretics, and 4) statins. **(Ongoing)**
- Evaluate office staff use and application of the IT-based CRM Tool for improving geriatric medication safety in primary care settings by examining use of the IT tool by office staff and changes in safety attitude constructs (safety climate, teamwork climate, stress recognition, working conditions, and perceptions of management and job satisfaction). **(Ongoing)**

2008 Activities: All eight eligible study sites from among UNYNET sites with EMRs have been recruited and have been randomized to either intervention or control groups using concealed allocation (i.e., the person recruiting practices is blinded to the allocation). Project staff have conducted baseline chart review screening for ADEs (using an ADE trigger tool) as well as Healthcare Effectiveness Data and Information Set (HEDIS) lab monitoring measures at six out of eight sites. The ascertainment training in the EMR extraction protocol has also been completed during this year.

All four intervention sites have completed their prioritization of perceived patient safety hazards in offices and have developed a common vision of the problems. Examples of problems prioritized include poor patient education regarding high-risk medications; high no-show rate; poor medication tracking; and poor teamwork/coordination among staff, especially related to processing of refill requests. These sites are implementing practice changes focusing on the prioritized problems. Examples include: incorporation of patient education brochures for high-risk medications; inclusion of diagnosis on prescriptions; patient reminders regarding follow-up; patient-carried medication lists; changes in the way that refill requests are handled; and formation of teams to address ongoing communication problems.

In addition, all four intervention sites have successfully completed the following:

- Installation of ACORNoffice.
- Onsite training and introduction to staff.
- Team assessment of safety culture and medication safety in the office using Ambulatory Safety Attitude Questionnaire (SAQ) and Safety Enhancement and Monitoring Instrument that is Patient centered (SEMI-P).

Graphic displays of the results from an analysis of SAQ and SEMI-P have been added to enhance understanding and create common vision in the teams. To enable the use of the Delphi technique, facilities have been created for receiving anonymous voting for priorities, and graphic display of consensus results of priorities of hazards is provided. The facility allows revision of priorities by individual respondents and invites anonymous comments accessible to the whole team to facilitate synergy. In addition, numerous quick reference sheets have been prepared. Examples are: “ACORNoffice Instructions” (including how to set up a new practice), “Getting Started” (including how to log in and how to change passwords), “Tips for Completing Online Surveys,” “Voting for Medication Safety” (including how to vote for your top three choices and make comments anonymously), “Updating Progress on Initiative/s Work Steps,” and “Entering Data for Indicators.”

Preliminary Impact and Findings: The project does not have any findings to date.

Selected Outputs

FAQs for SAQ and SEMI-P

Instructions with animation and voice-over for SAQ and SEMI-P completion

Tool for online:

- Delphi technique for prioritization of safety problems based on SEMI-P results
- Visual presentation of SEMI-P results
- Visual presentation of SAQ results
- Anonymous completion of SEMI-P survey via anonymous password
- Completion of SAQ via anonymous password

Web-based trigger tool for screening and review

Written procedures for use of trigger tool for data capture

Grantee's Most Recent Self-Reported Quarterly Status: The project is mostly on track with 80 to 99 percent of its milestones and is generally on time.

Milestones: Progress is mostly on track.

Budget: Spending is roughly on target.