

Using Health Information Technology to Improve Ambulatory Chronic Disease Care

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Summary: Coordinating fragmented chronic disease care requires new systems to manage information between providers and enhance communication with patients. To improve patient care quality and safety, the Family Medicine and General Internal Medicine practices at the University of Missouri–Columbia (MU) conducted a phased implementation of selected ambulatory care health information technology (IT) systems and functions. This project used a formative (in-process evaluation aimed at improvement) and summative (final overall) evaluation of health IT innovations (described below) designed to improve chronic disease care in the ambulatory primary care practices at MU. These innovations are the result of collaboration between MU clinicians from the Department of Family and Community Medicine and the Cerner Corporation, MU’s Certification Commission for Health Information Technology-certified medical record vendor.

Specific strategies for this project included providing physicians with comparative performance reports in one of three formats (patient panel performance through the EHR, patient panel performance level via email, or individual patient-only performance through the EHR), and providing patients with access to a Web-based interactive software system that features secure messaging, in-home reconciliation of all medications, and use of in-home “smart” diagnostic devices to send patient data directly to the care team.

The project used a multi-method evaluation of health IT innovations, including qualitative interviews, surveys, and analysis of outcome data, designed to enhance the quality of primary care for chronic diseases. The innovations were implemented differently in various practices and with different associated care systems. This variation in care processes provided an extraordinary opportunity to evaluate factors that influence health IT innovations’ effects on performance-based quality improvement, care coordination, and patient self-management.

Specific Aims:

- Evaluate the change in patient care processes and outcomes following introduction of health IT-generated clinician quality performance reports across differences in practices and peers. **(Achieved)**
- Evaluate the effectiveness and changes associated with an interactive Web-based patient interface software system (IQ Health), including in-home medication reconciliation. **(Achieved)**
- Evaluate the use of in-home “smart” diagnostic devices (e.g., blood pressure cuffs, glucometers) connecting patients with their care teams. **(Achieved)**
- Disseminate information regarding the development and impact of the interventions through Web teleconferences, professional meetings, educational lectures, and peer-reviewed journals. **(Achieved)**

2011 Activities: The evaluation of the impact of health IT-generated clinician quality performance reports on diabetes care was completed in 2011. Physicians were randomized to view diabetes performance reports through: 1) the electronic medical record (EMR); 2) a report emailed directly to them; 3) both venues; or 4) not at all. The evaluation compared the patient outcomes based on the type of performance report physicians received. Using qualitative methods, the research team investigated contextual factors, such as local barriers to and facilitators of achieving better performance measure scores, to determine their effect on practice outcomes.

The research team analyzed the data from the evaluation of the use of in-home “smart” diagnostic devices. This included analysis of the impact of the use of in-home devices on patient outcomes and patient’s and provider’s perspectives on use. Seventeen nurses and physicians were interviewed on their perceptions of the smart devices and the transmission of data from the devices to the practice.

The evaluation of the online medication verification process evolved considerably over the course of the project. In the final iteration, participants were asked to review their medication list and generate a message to their provider to notify them of any changes or additions made at the time of a pharmacist home visit. The messages were preferably sent through Healthe (a Web-based patient portal) or regular email. The team then compared information that patients sent with the pharmacist’s “gold standard” evaluation. Additionally, the team evaluated the nature of problems identified (e.g., incorrect listing of medications in the EMR) and the providers’ responses to these messages.

The evaluation of patient and provider expectations and perceptions concerning patient access to a Web portal for secure messaging, medical record review, and appointment scheduling was completed. The Web portal included secure messaging (including prescription requests), medical record review (including medication list and selected laboratory reports), and appointment scheduling. The team analyzed surveys to assess providers’ perceptions and experiences of using IQHealth and on-line surveys of patients who enrolled in IQHealth.

As last self-reported in the AHRQ Research Reporting System, project progress and activities were on track and project spending was on target. The project team used a 1-year no-cost extension to complete the evaluation. This project was completed in August 2011.

Impact and Findings: The diabetes quality performance reports in the format of a dashboard were efficient and improved accuracy. A composite measure of eight diabetes care-quality indicators improved in practices able to access performance information in the electronic record. Practices improving in the second year showed strong leadership, sharing of information, and exhibited adaptive reserve. Initial use of the patient portal was relatively limited but physicians felt better about its impact after use. In-home medication reconciliation is potentially limited by incomplete information from patients and failure to update records by providers. Home monitoring did not improve outcomes, but qualitative findings pointed to important implementation principles.

Target Population: Adults, Chronic Care*, Elderly*

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions in care settings, and the use of electronic exchange of health information to improve quality of care.

Business Goal: Implementation and Use

* This target population is one of AHRQ’s priority populations.