

Project Title:	Impact of Office-Based E-Prescribing on Prescribing Processes and Outcomes
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Organization:	Brigham and Women's Hospital
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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. The primary aim of this study is to evaluate the implementation of an electronic prescribing (e-prescribing) system in ambulatory settings. ZixCorp's PocketScript system is currently used in a large number of practices in Massachusetts, New Jersey, Pennsylvania, New York, North Carolina, California, and Louisiana, providing a large study population with diverse practice types (e.g., pediatric, adult primary care, family practice, and specialty offices), locations (e.g., urban, suburban, and rural), and sizes (from single-physician practices to groups of over 20 providers). This study will evaluate the full spectrum of e-prescribing. The project has an active partnership with the makers of the office-based e-prescribing system and with multiple insurance companies and public programs who will provide claims data.

The project includes three phases. The first phase uses data from the e-prescribing system to evaluate physician responses to decision support interventions and alerts. For the second phase, the project brings together experts on information technology (IT) and experienced survey researchers to develop a qualitative study demonstrating the impact of e-prescribing on prescribing processes and outpatient workflow, including a large-scale survey to develop a detailed understanding of how e-prescribing can be integrated into medical practice. The third phase of the project will draw on decades of experience studying large medical databases to evaluate prescribing decisions and clinical outcomes when e-prescribing is initiated. The project will link the e-prescriptions issued to patients with the pharmacy claims for those patients and will generate a comprehensive dataset to evaluate the true clinical impact of e-prescribing.

Although the public interest in e-prescribing is growing, including recent proposals to provide e-prescribing systems to all physicians, the data on how e-prescribing systems are used and what impact they actually have on prescribing processes and outcomes are still quite limited. The findings of this research will provide important lessons for clinicians, researchers, insurers, policymakers, patients, and all those with an interest in improving the use of prescription drugs.

Specific Aims

- Measure physician use of two safety-related e-prescribing functions: safety alerts and dispensed drug history. **(Ongoing)**

- Measure the effect of e-prescribing on processes of prescribing for physicians to assess characteristics of successful and productive adoption. **(Ongoing)**
- Extend and expand ongoing research to assess whether the adoption of e-prescribing is associated with improved clinical outcomes for patients. **(Upcoming)**

2008 Activities: Project staff have completed development of the physician survey based on information that was gathered from the focus groups and interviews. A collaboration has been developed with Surescripts and the Center for Improving Medication Management that has allowed the researchers to greatly expand both the sample size and geographic scope for the survey. The cognitive testing, field-testing, and survey activities were planned so that all results could be collected before summer 2009, at which point the investigators planned to begin compiling and analyzing results data.

All data use agreements have been completed and executed. System use data (Aim 1) have recently been transferred to the research team to be cleaned and uploaded. ZixCorp and the companies started assembling the main datasets to link patient identifiers, which will then be encrypted before sending the data to the project staff. ZixCorp and the companies also started working on linking the patient identifiers for this dataset to the identifiers that are in the data from an earlier study in the same setting (those data run through 3/31/2005). This is extending the timeframe planned for the process of preparing the dataset. This dataset offers the possibility of following early adopters of e-prescribing through several years of time and drawing conclusions regarding the longer-term impacts of e-prescribing.

Final Institutional Review Board (IRB) approval for the in-office visits has been obtained. Project staff at the Center for Health Information and Decision Systems (CHIDS) at the University of Maryland have been organizing in-office visits. Phone interviews have been conducted; results will be incorporated into the survey questions. Project staff have conducted four focus groups: two with doctors and two with nurses/office managers, exploring a variety of topics that were used in developing the survey. A manuscript analyzing the focus group findings has been through one round of review by all of the investigators and is now being prepared for submission.

Preliminary Impact and Findings: Focus group participants identified a range of issues associated with the current use of e-prescribing in their practices, including benefits derived/perceived, challenges encountered in using the technology, as well as workflow issues caused by the technology. Positive responses toward e-prescribing focused on its efficiency, the reduction in medical errors, patient satisfaction, and ease of use. Negative responses to e-prescribing focused on technological problems, medical errors, trust of technology, the learning curve for using the software, and surveillance and liability issues.

There were different reactions and changes to the e-prescription workflow based on which functions were completed by physicians versus office staff. Physicians entered prescriptions while seeing patients or immediately thereafter, whereas the office staff usually handled the refills. By splitting the tasks, significant efficiency was gained in the workflow process. It was also noted that in some instances the office staff “signed-on” as the physician in order to handle the prescriptions.

In regards to e-prescription evolution/adoption, the focus groups found that the attitude of the doctors played a major role in the perceived usefulness of the technology. Some practices that have adopted the technology have found that they cannot live without it now. On the other hand, several users do not yet have complete knowledge of the functionality of the application (e.g., what do the colors on the screen for various drugs represent).

It appears that, in some cases, either there is a disregard for policies regarding who can prescribe/approve medications or people simply do not know. It seemed that several doctors ‘delegated’ approval tasks to medical assistants with at least some knowledge that it was not proper protocol. One unintended

consequence that may be brought to light by e-prescribing is the legality of the prescribing process. However, it is unknown how often the paper-based prescribing process/policy was being abused. In general, there is naïveté, misinterpretation, and a complete unknowingness surrounding certain policies related to health IT adoption and use. For example, in mid-2008 some commented that e-prescribing would be mandated for Medicare patients by December 2008, while others said it was mandated, and still others had no knowledge of the ‘policy’. The consensus was that e-prescribing was a good thing and that it would be a tremendous hassle to go back to the ‘old way.’

Selected Outputs

AHRQ 2008 Annual Conference presentation: E-prescribing in Community-Based Practices: Successes and Barriers ([PowerPoint® File](#), 540 KB; [Web Version](#)).

Grantee’s Most Recent Self-Reported Quarterly Status: The slippage that the project has had is due to administrative issues. There was a short time between the Notice of Grant Award and the start date and delays in setting up administrative accounts, hence funds were not allocated right away. Similarly, the project was unable to begin formally negotiating the data use agreements until it was clear that the grant would be awarded. Now that the accounts are properly set up and the various contracts and data use agreements are moving forward, the project will be able to spend the funds on the planned activities.

Milestones: Progress is on track in some respects but not others.

Budget: Spending is roughly on target.