

Project Title: Improving Laboratory Monitoring in Community Practices: A Randomized Trial

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Organization: Harvard Pilgrim Health Care, Inc.

Mechanism: RFA: HS07-006: Ambulatory Safety and Quality Program: Improving Quality through Clinician Use of Health IT (IQHIT)

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AHRQ Funding Amount: \$990,640

Summary Status as of: December 2008

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: Knowledge Creation

Summary: This project was initiated in September 2007 and has completed the first third of the grant period. The Massachusetts e-Health Collaborative (MAeHC) provides an important opportunity to study implementation of health information technology (health IT) innovations in a community setting. In 2007, the MAeHC completed the implementation of commercially available electronic health records (EHRs) for 441 physicians in more than 200 office practices in 3 diverse communities in Massachusetts. In this group of small- to medium-sized office practices in both urban and rural regions of the State, this research grant is conducting a cluster-randomized controlled trial (RCT) of computerized point-of-care alerts in the EHR to prevent errors related to laboratory monitoring at the initiation and continuation of drug therapy. This project also creates a results management system to prevent errors related to the delay in follow-up of abnormal laboratory testing. The results of this study will be important because they will demonstrate and accelerate the dissemination of clinicians' use of health IT to improve patient safety and health care quality beyond integrated delivery systems and should be broadly generalizable to small- and medium-sized office practices in community settings.

The overall aim of the project is the development of clinical decision support (CDS) [point-of-care alerts] in a widely used, commercially available EHR, eClinicalWorks Version 8, which is a Certification Commission for Healthcare Information Technology (CCHIT) certified EHR vendor, that addresses the barriers to and facilitators of laboratory monitoring and that would be adaptable to other EHRs certified by CCHIT. The 3-year study tests the effectiveness of computerized CDS (point-of care alerts) and a results management system in community primary care and medical subspecialty practices in a cluster-randomized controlled trial with 2x2 factorial design. The project includes a qualitative analysis of the barriers to and facilitators of laboratory monitoring and timely follow-up of abnormal results among clinicians in MAeHC communities. This information will be used to develop, implement, and evaluate computerized CDS to facilitate the indicated laboratory monitoring of medications at the initiation or continuation of therapy and an enhanced computerized results management system. Baseline analyses will yield novel information on the rates and correlates of laboratory monitoring errors and the management of abnormal test results in community-based primary care and medical subspecialty settings. The study incorporates a dissemination plan, which includes not only publication and presentation of the results in scientific settings but also the creation of a dissemination guide that will be made freely available to aid other community-based ambulatory practices implementing EHRs and CDS.

Specific Aims

- Identify the barriers to and facilitators of laboratory monitoring and timely follow-up of abnormal results. **(Ongoing)**
- Design, implement, and evaluate CDS (point-of-care alerts) for laboratory monitoring in a widely used, commercially available EHR that address the barriers to and facilitators of laboratory monitoring. **(Ongoing)**
- Design, implement, and evaluate a results management system for the timely handling of abnormal laboratory test results in ambulatory care. **(Upcoming)**
- Develop a detailed dissemination guide that will be made widely available to other practices and communities interested in implementing the same or similar interventions. **(Upcoming)**

2008 Activities: The project's study design has been changed to implement the laboratory monitoring alerts and results management intervention simultaneously due to time constraints. There will still be four arms to the study as originally intended, but there will be only one phase. Project staff are planning to implement the results management intervention in June 2009.

The project has conducted focus groups to identify the barriers to and facilitators of laboratory monitoring and timely follow-up of abnormal results, and submitted their findings in a manuscript to the *Archives of Internal Medicine*. In addition, the project convened the panel for discussion of laboratory monitoring medications and will reconvene as study needs arise. The specifications for the alerts have been developed, and project staff are now meeting weekly with the EHR vendor to complete the alert programming. Project staff intend to finalize the alert programming and to test and pilot the system in the second quarter of 2009. In addition, project staff are currently communicating with the EHR vendor about the feasibility of building a results management system in the necessary time period.

In the summer of 2009, the plan is to implement the alerts in participating practices. Training will be conducted with participating clinicians prior to implementation. Project staff previously finalized a list of medications based on expert opinions that require laboratory monitoring that are included in the alerts. The project team also prepared a list of alerts and specifications for the EHR vendor. The EHR vendor is reviewing the alert requirements and working with their development team to include these in the next version upgrade for MAeHC practices.

Preliminary Impact and Findings: Focus group participants viewed laboratory monitoring as a critical, time-consuming task integral to their practice of medicine. Most believed they commit few laboratory monitoring errors and were surprised at the error rates reported in the literature. They listed various barriers to monitoring, including not knowing which physician was responsible for ensuring the completion of laboratory monitoring, uncertainty regarding the necessity of monitoring, lack of alerts/reminders, and patient non-adherence with recommended monitoring. The primary facilitator of monitoring was ordering laboratory tests while the patient is in the office. PCPs felt more strongly than specialists that computerized alerts could improve laboratory monitoring. Participants wanted to individualize alerts for their practices and warned that alerts must not interrupt workflow or require too many clicks. Physicians in community practice recognized the potential of computerized alerts to enhance their monitoring protocols for some medications. They viewed patient non-adherence as a barrier to optimal monitoring. Interventions to improve laboratory monitoring should address physician workflow issues, in addition to patients' awareness of the importance of fulfilling recommended therapeutic monitoring to prevent adverse drug events.

Selected Outputs

A manuscript of the focus group findings has been submitted for review to the *Journal of General Internal Medicine*.

Grantee’s Most Recent Self-Reported Quarterly Status: Current project plans are slightly delayed; a no-cost extension year may be requested. It is expected that all funds will be used by the end of the project.

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

Budget: Somewhat under spent, approximately 5 to 20 percent.