

**Project Title:** Medication Monitoring for Vulnerable Populations via Information Technology (MMITI)  
**Principal Investigator:** Lehmann, Christoph, M.D.  
**Organization:** Johns Hopkins University  
**Mechanism:** RFA: HS07-002: Ambulatory Safety and Quality Program: Enabling Quality Measurement through Health IT (EQM)  
**Grant Number:** R18 HS 017018  
**Project Period:** 09/07 – 08/09  
**AHRQ Funding Amount:** \$994,325  
**Summary Status as of:** December 2008

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**Strategic Goal:** Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.

**Business Goal:** Synthesis and Dissemination

**Summary:** This project was initiated in September 2007 and has completed the first half of the grant period. The overall goal of this project is a practice-based cross-sectional demonstration of the ability of interoperable health information exchange and the Certification Commission for Healthcare Information Technology (CCHIT) certified Misys 8.10.1 electronic health record (EHR) to provide useful quality and safety measures for the vulnerable populations served by two clinics that are part of the Baltimore Medical System (BMS) Community Health Center (CHC). The EHR version was 8.0 at the start of the MMITI project and has undergone one major release upgrade and four updates since then to be at the current 8.10.1 version. The quality and safety measures being evaluated were developed for ambulatory care by the National Committee for Quality Assurance (NCQA), supported by the National Quality Forum (NQF), and focus on the safety monitoring for chronic medications that are commonly used by patients with heart disease and diabetes mellitus. The project's intervention includes a monitoring bulletin (i.e., performance report card) provided to physicians every 2 months to inform them of patients that require therapeutic monitoring tests for one or more of the quality measures. The project is also evaluating the relationship between contextual factors (teamwork and safety climate at BMS) and provider assessments of EHR quality and safety data as useful and actionable, as well as evaluating whether deployment of EHR quality and safety measurement efforts will improve teamwork and safety climate at the clinics.

To identify patients eligible for inclusion in the quality measures, and therefore the monitoring bulletin, a machine query was developed that uses the BMS EHR to find patients eligible for the measures. Data to fulfill the measures are collected using a newly developed bi-directional interface and patient laboratory history back-loading capability between Johns Hopkins' Pathology Data Systems Department and the BMS EHRs. There were challenges in establishing the interfaces, including divergent data standards in both systems, and challenges in the coordination among the stakeholders, each of which had unique data system issues. For example, patient identifiers in the BMS and Johns Hopkins laboratory data did not always match, requiring in-depth investigation to ensure that patient information remained linked to the correct patient during data exchange. The high volume of patient records necessary for back-loading of data required that it be done in batches over a period of several weeks.

## Specific Aims

- Develop and implement via EHR accurate quality and safety measures focused on medication monitoring for vulnerable populations that are served by BMS CHC, and explore factors that influence accuracy of EHR-derived measures. **(Achieved)**
- Develop and implement EHR-based quality and safety measures of medication monitoring for vulnerable populations that are served by BMS CHC that are useful to clinicians and senior leaders. **(Ongoing)**
- Develop and implement EHR-based quality and safety measures of medication monitoring for vulnerable populations that are served by BMS CHC that impact patient outcomes. **(Ongoing)**
- Evaluate the relationship between contextual factors (teamwork and safety climate at BMS) and provider assessments of EHR quality and safety data as useful and actionable, as well as evaluate whether deployment of EHR quality and safety measurement efforts will improve teamwork and safety climate at CHC. **(Ongoing)**

**2008 Activities:** Dr. Lehmann and the project team made significant progress on each of the project aims. A machine query that uses the EHR to find patients eligible for the project quality measures was designed and implemented. The query was validated and found to perform better than manual chart review to identify eligible patients. The interface implementation was completed by the end of the fourth quarter along with back-loading 2 years of laboratory data history. The monitoring bulletin and interview instrument to ascertain provider reactions were developed and administered twice over the course of the year. The Safety and Attitudes Questionnaire (SAQ) was also administered twice to all staff of both BMS clinic sites.

**Preliminary Impact and Findings:** The preliminary impact of the lab interface activity has reduced the number of tasks involved in accessing patient information by providers. Additional findings related to patient identification between the programmed query and manual review are included in a manuscript being submitted for publication and will be made available closer to the completion of the project.

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## Selected Outputs

Monitoring bulletin for providers, a provider survey designed to measure provider experiences using the bulletin.

Interview guide designed to further investigate a provider's understanding of a patient's health status if the guidelines identified in the monitoring bulletin are not implemented.

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**Grantee's Most Recent Self-Reported Quarterly Status:** The project is under spent due to the technological delays in implementing the laboratory interface, an activity that was essential to address the research aims of this project. This affected some of the associated downstream activities like machine query verification, administration of the bulletins and surveys to the providers at both the BMS sites, and delay in data collection and analysis. The project has revised the timeline accordingly, and the team will complete the delayed activities during the second year of the project.

**Milestones:** Progress is completely on track.

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