

Electronic Medication Management

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Organization:	Columbia University Health Sciences
Mechanism:	PAR: HS08-268: Small Research Grant to Improve Health Care Quality Through Health Information Technology (R03)
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AHRQ Funding Amount:	\$99,998
Summary Status as of:	December 2010

Target Population: Inner City*, Low SES/Low Income*, Medicaid, Medically Underserved, Racial/Ethnic Minorities*: Hispanic

Summary: When patients transfer to new health care settings, there is an increased risk of medication errors due to incomplete or inaccurate medication information. While most changes to a patient's medication regimen are purposeful and documented by the care provider, unintentional and potentially harmful medication discrepancies may exist. To decrease such errors, in 2006 The Joint Commission created a National Patient Safety Goal requiring medication reconciliation for each care transition where medication orders are changed or rewritten. Reconciliation compares a patient's new medication orders with all medications the patient is currently receiving.

In 2008, the New York-Presbyterian Healthcare System (NYP) instituted a structured, electronic process designed to improve medication reconciliation as patients transitioned between ambulatory-to-hospital and hospital-to-ambulatory care settings. Before the adoption of this intervention, pre-admission medications and discharge medications were kept as free-form text in the patient's electronic health record (EHR). After adoption, medications were documented using a structured electronic medication list shared across NYP's ambulatory and inpatient EHRs, including the ambulatory and inpatient Certification Commission for Health Information Technology-certified Eclipsys.

This study is evaluating the effectiveness of the electronic medication reconciliation intervention by comparing outcomes pre- and post-implementation in six community-based primary care clinics and two inpatient facilities. Specifically, the study is evaluating: 1) the effects on provider workflow during medication reconciliation; 2) the evolution of the completeness of the ambulatory and inpatient medication lists; and 3) the possible decrease in the number of clinically important unintentional medication discrepancies. These results will yield knowledge on whether the adoption of a fully electronic medication reconciliation process is associated with a decrease in the rate of potentially harmful, unintentional medication discrepancies across care settings.

Specific Aims:

- Assess differences in medication management workflow in two provider cohorts before and after the adoption of electronic medication reconciliation. **(Achieved)**
- Assess differences in the completeness of documented medication lists in two provider cohorts before and after the adoption of electronic medication reconciliation. **(Ongoing)**

- Assess differences in the rate of clinically important medication discrepancies in two provider cohorts before and after the adoption of electronic medication reconciliation. **(Ongoing)**

2010 Activities: Using an algorithm developed in 2009, Dr. Vawdrey identified 6,079 patients who had transitioned across multiple layers of care, which is defined as a clinic visit followed by an inpatient stay followed by another clinic visit, during the 2-year period of October 2007 through October 2009. Ambulatory visits that did not have an associated electronically available medication list were identified and excluded from the study. Additional activities in 2010 included an electronic chart review by clinical experts to document the completeness of the medication list at all transition points (clinic visit, hospital admission, hospital discharge, and followup clinic visits) and to identify the medication discrepancies that exist between the ambulatory and inpatient medication lists. In addition, the project team completed the work for the first aim: analyzing how the medication reconciliation process affected the ways providers collect, document, and reconcile medications. The results of this aim were presented at the 2010 American Medical Informatics Association (AMIA) Annual Symposium, [“Impact of Electronic Medication Reconciliation at Hospital Admission on Clinician Workflow”](#). Notably, the oral presentation received an AMIA Distinguished Paper Award.

Grantee’s Most Recent Self-Reported Quarterly Status (as of December 2010): Project progress is mostly on track and spending is roughly on target.

Preliminary Impact and Findings: The process of performing and documenting medication reconciliation at hospital admission relied on a longitudinal medication list called the “Outpatient Medication Profile” (OMP). Clinician compliance with documenting medication reconciliation was difficult to achieve, but approached 100 percent after a “hard-stop” reminder was implemented. The hard stop reminder locked providers out of the order entry system 18 hours after hospital admission until reconciliation was documented. Before the new process was adopted, the average number of medications contained in the OMP for a patient upon admission was less than 2. One year after adoption, the average number had increased to 4.7, and there were regular updates made to the list. Updating the OMP was predominantly done by physicians, nurse practitioners, and physician assistants (94 percent), followed by nurses (5 percent) and pharmacists (1 percent).

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: Knowledge Creation

* *AHRQ Priority Population*