Project Title:	Improving Quality through Decision Support for Evidence-Based Pharmacotherapy
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Organization:	Duke University
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:	$1,198,429
Summary Status as of:	December 2008

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: Implementation and Use

Summary: This project was initiated in September 2007 and has completed the first third of the grant period. This project seeks to develop a decision support system for medication management to promote increased adherence to evidence-based pharmacotherapeutic guidelines both through traditional clinic-based models of care and through new care models including population health management and cross-disciplinary teams. The system is based on an emerging standard for decision support and uses routinely available claims and scheduling data in order to serve as a replicable model for broader use of decision support for medication management. The decision support system used in this project, known as the System for Evidence-Based Advice through Simultaneous Transaction with an Intelligent Agent across a Network (SEBASTIAN), is the basis for an international Health Level 7 (HL7) standard for Clinical Decision Support (CDS) using a service-oriented architecture. Increased availability and use of decision support tools for medication management can be expected to reduce medication errors, improve health care quality at an acceptable cost, and augment disease management for patients and populations.

This project builds upon a regional Health Information Exchange (HIE) network created to connect providers serving 43,000 Medicaid beneficiaries across traditional institutional boundaries from both rural and urban settings in a six-county region in the Northern Piedmont of North Carolina. This network includes 28 private primary care clinics, 3 federally qualified health centers, 4 rural health clinics, 3 urgent care facilities, 11 government agencies, 5 hospitals, and 2 cross-disciplinary care management teams. Rules for evidence-based pharmacotherapy for priority areas identified by the Institute of Medicine (IOM) will be encoded in a standards-based decision support tool that has been in use within the HIE network for 3 years to promote population health management. These rules will be designed to function using routinely available claims and scheduling data in order to make the proposed approach more generalized, portable, and scalable. This approach will support both traditional clinic-based models of care and new care models, including population health management and the use of cross-disciplinary teams. The primary study hypothesis is that adherence to evidence-based pharmacotherapy will be highest among patients who receive medication management information sent both to their clinic-based practitioners and to their care managers. The expected effect on safety/quality from this project will be improved adherence to evidence-based pharmacotherapy guidelines. This project will undertake a randomized clinical trial within an HIE network known as Community-Oriented Approach to Coordinated Healthcare (COACH) to evaluate the impact of the medication management interventions. To enhance the data in the HIE, new data importation programs are being developed for practices using different health

information technology (IT) vendor-based practice management applications for patient scheduling and encounter billing activities. Vendors include IDX, Health Pro, Mysis Tiger V, NueMed, and Healthmatics. Daily importation of scheduling and encounter data is in place for 11 of 14 clinical sites. The remaining three clinics are in test mode.

Specific Aims

- Expand the functionality of an existing decision support system in use within a regional HIE network for Medicaid beneficiaries to incorporate evidence-based (EB) pharmacotherapy and to promote medication adherence. **(Ongoing)**
- Implement and evaluate the impact of two complementary interventions for medication management on adherence to EB pharmacotherapy among Medicaid beneficiaries in ambulatory care settings through a three-arm randomized controlled trial. **(Ongoing)**
- Compare resource utilization and assess the economic attractiveness (cost-savings or cost effectiveness) of the interventions to promote medication adherence and EB pharmacotherapy. **(Ongoing)**
- Disseminate information regarding the development and impact of the interventions through Web teleconferences, professional meetings, educational lectures, and peer reviewed journals. **(Ongoing)**

2008 Activities: Project staff are continuing the process of developing and encoding evidence-based pharmacy rules to make them machine process-able. System architecture meetings have defined the necessary system enhancements to support the point-of-care (POC) report. The preliminary and final reviews of the first data bank (FDB) drug classifications have been completed to ensure that the FDB classifications appropriately associate the medications of interest. Software to generate the POC medication and adherence reports has been developed, and the workflow and process analysis interviews with each of the 14 clinical sites to ensure effective delivery and utilization of the POC report have been initiated. Currently, the project team is working with the 14 clinical sites to obtain registration and scheduling data on a daily basis. However, as most sites have different application software, these data importation efforts have required more time and effort than expected.

Preliminary Impact and Findings: There are no findings to report to date.

Selected Outputs

Co-presented an AHRQ Webinar, October 2008: Use of Clinical Decision Support and the Impact of Clinical Decision Support on Workflow; presentation: Use of Clinical Decision Support in Clinical Practice. Adobe PDF File, 2.72MB. Accessed May 2009.

Presented at the annual AMIA conference, November 2008: Development and Evaluation of an Improved Methodology for Assessing Adherence to Evidence-Based Drug Therapy Guidelines Using Claims Data.

Grantee's Most Recent Self-Reported Quarterly Status: Progress is on track in some respects but not others. About 65 to 80 percent of the project milestones are being met, but there is a viable plan for achieving the others; the project is staying close to schedule with some slippage. This slippage is in part the result of delays from partner primary care clinics and their IT vendors that have slowed efforts to import schedule data needed for this intervention. It is also due in part to the complexity in developing and implementing the decision support rules needed to generate evidence-based pharmacotherapy recommendations. The development of the POC medication reports has been delayed because the complexity of the task is greater than initially projected and because of unplanned extended absences of important study staff members. Furthermore, the hiring of a new software engineer to develop the highly complex SEBASTIAN CDS component for this project required an extended training period. Project staff

are currently estimating a three-month shift in the time line for the deployment of the intervention. Hiring delays and extended medical leave for important staff members account for much of the under spending in the personnel and professional services category. Local travel expenses were lower than anticipated as clinic workflow assessment visits were delayed due to the project coordinator's illness. In addition, the rate of spending has slowed down with the slowdown in system development. Other expenses related to project implementation initially targeted for CY2008 will be incurred during CY2009-2010. It is anticipated that future expenses will track with the revised deployment timeline.

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

Budget: Significantly under spent, more than 20 percent.