

Improving Quality through Decision Support for Evidence-Based Pharmacotherapy

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Organization:	Duke University
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Target Population: Chronic Care*, Medicaid

Summary: This project developed a decision support system for medication management with the goal 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 standard for clinical decision support 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 known as Community-Oriented Approach to Coordinated Healthcare (COACH), that was 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, three federally qualified health centers, four rural health clinics, three urgent care facilities, 11 government agencies, five hospitals, and two cross-disciplinary care management teams. Rules for evidence-based pharmacotherapy for priority areas identified by the Institute of Medicine (IOM) have been encoded in a standards-based decision support tool that has been in use within the HIE network for 4 years to promote population health management. These rules are designed to function using routinely available claims and scheduling data in order to make the proposed approach more generalized, portable, and scalable. 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 and quality from this project will be improved adherence to evidence-based pharmacotherapy guidelines. This project involves a three-arm randomized controlled clinical trial (RCT) within COACH to evaluate the impact of the medication management interventions. To enhance the data in the HIE, new data

importation programs were developed for practices using different health information technology vendor-based practice management applications for patient scheduling and encounter billing activities.

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. **(Achieved)**
- 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 RCT. **(Ongoing)**
- Compare resource utilization and assess the economic attractiveness of the interventions to promote medication adherence and EB pharmacotherapy. **(Upcoming)**
- Disseminate information regarding the development and impact of the interventions through Web teleconferences, professional meetings, educational lectures, and peer-reviewed journals. **(Ongoing)**

2010 Activities: The three-armed medication management RCT was fully initiated in December 2009 at the 13 participating practices, and closed in December 2010. All components of the enhanced decision support system functioned reliably through the year. On the business day prior to a scheduled appointment for one of the study patients, SEBASTIAN is used to generate medication management reports that include a list of known IOM conditions, a graphical summary of the filled prescriptions for the last year arranged by therapeutic class, a numeric calculation of adherence for each medication and class over one year, and EB pharmacotherapeutic suggestions for classes of medications that are missing based on known patient conditions. The medication management point-of-care reports are consistently generated and delivered to the clinics on the day prior to scheduled appointments so clinic staff can deliver the reports to providers when patients are being seen in the clinics. Case managers also receive email alerts for patients who have potential medication adherence issues related to a chronic disease, no visits to their primary care clinic in the past 6 months, and no scheduled appointments at their primary care clinic.

Data collection and site monitoring visits were main focuses of team activities during 2010. In January 2010, the team finalized standard operating procedures for conducting the visits. The purpose of the visits was threefold: to verify report handling procedures; to verify receipt of the medication management reports by providers at the point-of-care; and to obtain feedback about provider satisfaction and report utilization. The visits were held at months 1, 3, 6, 9, and 12 of the trial. Initial visits were conducted during a 4-week period in January and February with a convenience sample of 11 practices and 22 primary care providers who received the reports. At several clinics the report handling procedures, which clinic staff proposed prior to implementation, were not being accurately followed and corrective measures were taken. Accordingly, providers in several clinics reported inconsistent receipt of the reports prior to scheduled patient appointments and issues leading to these inconsistencies were identified and addressed. In each of the 11 clinics some providers needed additional education on the medication management reports and instruction on how to use the report for clinical decision support. In addition to the monitoring visit methods described above, the 6-month visit also included a contextual evaluation survey of the intervention at the four clinic sites with the highest point-of-care report volume for practice managers and providers.

Additional feedback on provider utilization of the report and the EB suggestions is obtained when providers return the optional data update feedback form. Provider comments have generally been favorable and

indicate the reports are being used for clinical decision support and to prompt pharmacotherapy discussions with patients. By the end of November, approximately 90 percent of the data update feedback forms had been entered into the Access study database for data analysis.

The team presented a paper, [“Improving Medication Adherence in a Regional Healthcare Information Exchange Using a Scalable, Claims Driven, and Service-Oriented Approach”](#), and a poster, [“Utility of Point-of-care Medication Management Reports Generated through a Decision Support Web Service”](#), at the 2010 American Medical Informatics Association (AMIA) Annual Symposium. Notably, the poster presentation received one of six AMIA Distinguished Poster Awards out of 366 posters accepted in 2010.

Grantee’s Most Recent Self-Reported Quarterly Status (as of December 2010): The team has been approved for a no-cost extension through August 2011. Progress is now completely on track, according to the revised project plan and timeline, and the budget is somewhat underspent, approximately 5 to 20 percent.

Preliminary Impact and Findings: Full evaluation data will not be available until the RCT is complete; however, informal feedback from providers on the usefulness of the medication management report has been favorable and suggestions have been made to keep the system operational after the grant ends and to use the system on other populations and in other venues.

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

* *AHRQ Priority Population*