

Improving Lab Followup by Delivering an Enhanced Medication List to Outpatient Physician Practices

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Target Population: General

Summary: Medication errors and adverse drug events (ADEs) are a major problem across the United States and have serious clinical and economic consequences. Although outpatient providers could detect and prevent many of these errors, their limited time with patients, their high workloads, and the challenge of managing a large volume of dynamic information can affect their ability to do so. Providers need to know what medications their patients take now, or have previously taken, if they are to improve medication management. However, primary care providers often do not know which medications have been prescribed by other providers or which non-prescription medications the patient takes. An accurate and complete medication list, facilitated by technology, can be an effective tool to promote the quality and safety of health care.

The goal of this project is to design, develop, and evaluate a method of providing medication data from the Indiana Network for Patient Care (INPC) to ambulatory primary care practices to enhance health care quality and safety. The project team at Indiana University and the Regenstrief Institute developed the Enhanced Medication History (EMH), a medication history based on pharmacy dispensing records from three sources: RxHub commercial pharmacy benefit managers, Medicaid, and the Wishard County health services outpatient pharmacy. The EMH is supplemented by laboratory data from INPC and includes clinical decision support reminders specifically related to the patient on drug-drug interactions, drug-lab interactions, and drugs to be avoided in the elderly.

The project team modified the clinic registration system to create a trigger message when a patient registers. The trigger message is sent to the INPC to collect patient data and automatically produce a patient-specific EMH report. The report is delivered to the correct printer at the correct clinic within 1 to 2 minutes of the patient's registration. When the report is printed, nurses or clinic staff place the document in the patient chart for the physician-patient visit.

The project team evaluated the EMH in a randomized, controlled trial, examining its impact on patient quality and safety indicators compared to usual care, as well as provider satisfaction with the EMH. Over a 46 week time period, the EMHs were successfully delivered to health care providers at two sites of a community health organization for 4,449 patients. Based on their written and verbal evaluations, the physicians considered the medication histories to be a useful tool even though the medication histories were incomplete summaries. The EMHs complemented information from chart notes and patients and helped discover previously unknown medication usage.

Project Objectives:

- Aggregate medication histories from multiple sources into a single document. **(Achieved)**
- Add decision support rules to medication history documents in selected areas, such as inadequate lab monitoring, drugs with abnormal labs, or drugs to avoid in the elderly. **(Achieved)**
- Deliver enhanced medication history documents to clinics. **(Achieved)**
- Examine instances of decision support rule use. **(Achieved)**
- Examine quality and safety improvements. **(Achieved)**

2010 Activities: The evaluation period ended in October 2009. The main focus of activity in 2010 was data analysis, manuscript development, and dissemination, including a poster, “Medication Histories in the Indiana Network for Patient Care: Enhanced with Decision Support Reminders and Delivered to Primary Care Clinicians” presented at the Agency for Healthcare Research and Quality Annual Health Information Technology Grantee and Contractor Meeting in June 2010 and an oral presentation at the American Medical Informatics Association Annual Symposium in November 2010, [“Continuity of Care Document Enables Delivery of Medication Histories to the Primary Care Clinician.”](#)

Impact and Findings: Although analysis did not detect any significant difference between intervention and control patients on the safety and quality measures, potentially due to an insufficient sample size based on a decision to enlarge the intervention group (80 percent of sample versus 20 percent for the control), providers found the medication histories useful, especially when the provider did not know what the patient was taking. Nine physicians were surveyed and reported the usefulness of medication histories; however, there was less agreement on the completeness of the histories. It was strongly agreed that medication histories helped discover drugs which were previously unknown and helped identify overuse of controlled substances. The entire process, from the initial arrival of the patient to the final delivery of the printed report, required less than 2 minutes with minimal disruption to clinic workflow. The process was triggered automatically by the normal activities of registering a patient. The printed documents were easily integrated into the paper-based process of assembling a clinic chart.

The project team reported several lessons for others developing similar interventions:

- Keep disruptions in clinic workflow to a minimum;
- Have a clinic liaison to identify potential problems;
- Essential data sharing organizational agreements need to be in place;
- Develop a linkage algorithm to connect patient identifiers from multiple data sources;
- Test and fine-tune the information in the patient arrival messages with the clinic management;
- Representing drug strength information is a complex task that may require improvements in external data sources and message standards;
- It is important to deliver the EMHs quickly; and,
- Until full electronic health record adoption, solutions must be flexible enough to support paper-based clinics.

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