

The Medication Metronome Project

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Summary: One goal of primary care is to reduce the morbidity and mortality of chronic diseases such as hypertension, type 2 diabetes, and hyperlipidemia. However, national and local data indicate that the United States health care system is falling significantly short of evidence-based goals for these three conditions, both in terms of risk-factor control and in monitoring adverse drug events. Novel uses of health information technology (IT) are needed to support more effective medication management for chronic diseases in the primary care setting.

The Medication Metronome Project is testing a model of chronic disease medication management in which specific clinical actions, such as the decision to initiate or adjust medications, are performed independently of the office visit. The study is implementing a randomized controlled trial using an existing electronic health record (EHR) at Massachusetts General Hospital (MGH) to evaluate the value of an IT system that supports between-visit medication safety monitoring and dose adjustment. This “Medication Metronome” is designed to enable providers to schedule future laboratory tests related to a specific set of medications for glycemic, cholesterol, and blood pressure management. As these lab test dates become due, the Medication Metronome system reminds patients via letter and informs providers when the tests are “missing.”

The goal of this intervention is to implement an efficient, visit-independent system to ensure that patients are rapidly and safely brought to evidence-based treatment goals and to prevent delays in planned laboratory monitoring. This will be achieved through an iterative process of medication adjustments so that risk-factor control is not entirely dependent upon face-to-face office visits. The broader goal is to foster greater patient-physician connectedness by combining independent medication management with more productive visit-based care. This research is relevant to nationwide efforts to demonstrate the most effective ways to implement new IT-based delivery models that expand care beyond the traditional clinic visit.

Specific Aims:

- Develop the Medication Metronome system. (**Ongoing**)
- Conduct a randomized controlled trial of the Medication Metronome system. (**Upcoming**)
- Evaluate the impact of the Medication Metronome visit-independent care model on both the frequency and content of office-based visits. (**Upcoming**)

2011 Activities: The focus of activity was on the development of the Medication Metronome health IT system. This has involved both health IT development and qualitative evaluation of design prototypes

to create a system that supports timely medication intensification, improves safety, and meets both patient and provider needs. In April and May 2011, iterations of the system architecture with mock-ups of the user interface were presented to the project's primary care external advisory board, a group of practice providers representing all 12 primary care practices within MGH's primary care Practice Based Research Network. An all-investigator research meeting was also convened in June to review feedback from clinicians.

Since then, a medication prescription user interface has been developed to ensure compatibility among Metronome-identified clinics. A key requirement for implementation of the Medication Metronome system is the implementation of computerized laboratory order entry into these practices. The project team has been working on the interface to ensure that electronically generated laboratory slips match the MGH blood laboratory knowledge base. Development of the orders module was completed at the end of 2011, with final testing and planned release in early 2012.

As last self-reported in the AHRQ Research Reporting System, the progress and activities are completely on track and project budget funds were moderately underspent. Initial underspending was related to the 10-month budget in the first year of the project and the short time frame from notification of grant award and time associated with billing for personnel costs for work performed. Spending is anticipated to increase in upcoming quarters as several project activities commence. The project team anticipates that all approved funds will be spent upon successful completion of the project.

Preliminary Impact and Findings: The project has no findings to date. However, feedback from the clinician training sessions resulted in the addition of the "Do Now" function, a key design update. This function allows a patient who is in the doctor's office for another reason, on a day close to the original laboratory due date, to change the due date to the current day to have their blood drawn "early" and more conveniently. Clinicians believe this feature has potential to increase blood-draw compliance.

Target Population: Chronic Care*, Diabetes, Hypertension

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

** This target population is one of AHRQ's priority populations.*