

Project Title:	Statewide Implementation of Electronic Health Records
Principal Investigator:	Bates, David, M.D., M.Sc.
Organization:	Brigham and Women's Hospital
Mechanism:	RFA: HS04-011: Transforming Health Care Quality through Information Technology (THQIT)
Grant Number:	UC1 HS 015397
Project Period:	09/04 – 09/08, Including No-Cost Extension
AHRQ Funding Amount:	\$1,497,154
Summary Status as of:	September 2008, Conclusion of Grant

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

Summary: In 2005, the Massachusetts e-Health Collaborative (MAeHC) completed a proposal process for selection of three Massachusetts communities as pilots for full statewide electronic health record (EHR) implementation. The State of Massachusetts has over six million residents who are cared for by approximately 20,000 physicians in about 6,000 practices; the three selected communities represent over 150 ambulatory practices with more than 400 clinicians. Prior to this project, the MAeHC had implemented full EHRs in all of these practices and created an operational clinical data exchange platform in two of the three communities. This study comprehensively evaluated the intervention and measured trends in health information technology (IT) adoption across Massachusetts. Multiple statewide surveys of office staff and physicians addressed barriers to adoption and use of EHRs. A quasi-experimental pre-post study evaluated the effect of EHR implementation on medication errors. A randomized controlled trial assessed the effects of academic detailing on the uptake of new EHR systems. Merging survey results with claims data enabled the evaluation of the relationship between EHRs and quality of care. An additional analysis examined the relationship between EHRs and malpractice claims.

Specific Aims

- Evaluate the effectiveness of an intervention designed to increase the rate and extent of adoption of EHRs in physicians' offices throughout Massachusetts. **(Achieved)**
- Determine the effect of EHR use on medication error rates, and determine the effects of EHR use on quality of care in primary care office practices. **(Achieved)**
- Develop, pre-test, and administer a survey to Massachusetts licensed physicians before and after implementation of a multi-stakeholder collaborative intervention. **(Achieved)**
- Measure the degree and correlates of physician receptivity to EHRs. **(Achieved)**
- Assess the effects of the statewide program on physician receptivity to and use of EHRs. **(Achieved)**
- Measure potential facilitators of EHR adoption by physicians. **(Achieved)**
- Measure the effectiveness of academic detailing in fostering successful implementation and usage of EHRs among physicians adopting such systems. **(Achieved)**

2008 Activities: Data from the surveys on EHR use were received and analyzed over the course of 2008. Articles were readied for publication.

Impact and Findings: The most significant barriers to EHR adoption were financial, which was most apparent in small practices. While a majority of physicians had adopted EHRs by 2005, only a small

fraction regularly used key functions, including clinical decision support. EHR adoption was associated with lower rates of malpractice settlements. The relationship between EHRs and quality of care is complex and depends not only on EHR adoption, but also on usage of key EHR features.

Selected Outputs

Wright A, Soran C, Jenter CA, et al. Physician attitudes toward health information exchange: results of a statewide survey. *J Am Med Inform Assoc* 2010;17(1):66-70.

Quinn MA, Wilcox A, Orav EJ, et al. The relationship between perceived practice quality and quality improvement activities and physician practice dissatisfaction, professional isolation, and work-life stress. *Med Care* 2009;47(8):924-8.

Wright A, McGlinchey EA, Poon EG, et al. Ability to generate patient registries among practices with and without electronic health records. *J Med Internet Res.* 2009;11(3):e31.

Rudin RS, Simon SR, Volk LA, et al. Understanding the decisions and values of stakeholders in health information exchanges: experiences from Massachusetts. *Am J Public Health* 2009;99(5):950-5.

Jha AK, Bates DW, Jenter C, et al. Electronic health records: use, barriers and satisfaction among physicians who care for black and Hispanic patients. *J Eval Clin Pract* 2009;15(1):158-63.

Goroll AH, Simon SR, Tripathi M, et al. Community-wide implementation of health information technology: the Massachusetts eHealth Collaborative experience. *J Am Med Inform Assoc* 2009;16(1):132-9.

Virapongse A, Bates DW, Shi P, et al. Electronic health records and malpractice claims in office practice. *Arch Intern Med* 2008;168(21):2362-7.

Simon SR, Kaushal R, Jenter CA, et al. Readiness for electronic health records: comparison of characteristics of practices in a collaborative with the remainder of Massachusetts. *Inform Prim Care* 2008;16(2):129-37.

Simon SR, McCarthy ML, Kaushal R, et al. Electronic health records: which practices have them, and how are clinicians using them? *J Eval Clin Pract* 2008;14(1):43-7.

Simon SR, Kaushal R, Cleary PD, et al. Correlates of electronic health record adoption in office practices: a statewide survey. *J Am Med Inform Assoc* 2007;14(1):110-7.

Simon SR, Kaushal R, Cleary PD, et al. Physicians and electronic health records: a statewide survey. *Arch Intern Med* 2007;167(5):507-12.

Jenter CA, Simon SR, Volk LA, et al. Evaluation of a statewide implementation of electronic health records. In Kuhn KA, Warren JR, Leong T-Y, editors. *Medinfo 2007: Building Sustainable Health Systems. Proceedings of the 12th World Congress on Health (Medical) Informatics; 2007. Amsterdam: IOS Press; 2007. p. 2575-9.*

Grantee's Most Recent Self-Reported Quarterly Status: This project has been completed.

Milestones: Progress is mostly on track.

Budget: On target.