

Project Title: Electronic Records to Improve Care for Children
Principal Investigator: Shiffman, Richard N., M.D., M.C.I.S.
Organization: Yale University
Mechanism: RFA: HS04-011: Transforming Health Care Quality through Information Technology (THQIT) – Implementation Grants
Grant Number: UC1 HS 015420
Project Period: 09/04 – 09/07
AHRQ Funding Amount: \$1,183,278
Summary Status as of: September 2007, Conclusion of Grant

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions in care settings, and the use of electronic exchange of health information to improve quality of care.

Business Goal: Implementation and Use

Summary: Patients receive health care services from multiple provider organizations across the continuum of care, and often this care is not well-coordinated, leading to patient confusion, duplicated services, and risks to patient safety. Many patients have difficulty understanding and conveying information about their health problems and health care services, increasing the risks of duplicated care and care that can cause harm if it conflicts with treatment provided elsewhere. As a result, the total cost of care and provider liability is increased, and patient care may be compromised.

A shared, community-wide electronic health record (EHR) for health care providers in pediatric primary care, school health, specialty care, and emergency medicine was implemented to demonstrate improvements in quality of care for children with asthma. The project focused on understanding organizational barriers and factors that enhance information technology (IT) acceptance and on defining administrative and technical elements of a community-wide health IT infrastructure that can be further extended to additional health partners.

Several tasks were undertaken to evaluate the project: 1) the number and extent of information linkages between collaborating organizations was reviewed; 2) a retrospective record review was performed to define baseline continuity of information error rates between the pediatric emergency department and two community health centers; 3) clinical decision support for chronic asthma management was implemented and was combined with audit and feedback to measure changes in processes of care; and 4) a qualitative investigation was conducted to assess personal hopes, concerns, and organizational supports and barriers to health IT implementation.

The results of the study included: 1) the formation of a team of stakeholders that effectively managed the project and achieved stated goals; 2) the development of a collaborative community partnership that included competing hospitals, an academic department of pediatrics, neighborhood health centers, school health, and public health; 3) implementation of a health information exchange (HIE) infrastructure among children's health care providers in the community that can be scaled to other populations; and 4) the development of an innovative framework to understand issues that arise in organizations when health IT is implemented. It is anticipated that project findings will contribute to a burgeoning literature on overcoming implementation barriers. Lessons learned can be generalized because the vendor-supplied products utilized through this study can be purchased and installed by others.

Specific Aims

- Implement a shared, community-wide EHR for health care providers in pediatric primary care,

school health, specialty care, and emergency medicine. **(Achieved)**

- Demonstrate improvements in quality of care for children with asthma. **(Achieved)**
- Understand organizational barriers and factors that enhance IT acceptance. **(Achieved)**
- Provide administrative and technical elements of a community-wide health network infrastructure that can be further extended to additional health partners. **(Achieved)**

2007 Activities: Major 2007 activities included the continued implementation of EHR and HIE infrastructure at participating facilities as well as the implementation of a computer-based decision support system supporting the provision of care for patients with persistent asthma. Data exchange interfaces were also tested and implemented. Data collection and analysis activities were conducted for comparison with baseline data collected from paper charts to assess the impact of health IT on quality of care for the specified patient population. Clinicians were provided with quarterly summaries of their care practices relative to patient problem lists, categorizing asthma severity, and prescribing appropriate pharmacologic interventions for children with persistent asthma. Data were collected through a series of surveys and semi-structured interviews and were subsequently analyzed to assess issues that arise in organizations when health IT is implemented. Various manuscripts and other documents were being completed as the project completed.

Impact and Findings: The project confronted a serious chronic health problem (asthma) in a particularly vulnerable population—inner city children, an Agency for Healthcare Research and Quality-defined priority population. The project directly addressed critical quality and safety issues in the care of children with asthma. An unexpectedly high level of continuity of information errors and continuity of followup errors in the study community were identified. Important steps were taken toward remedying those failures.

Following review of records from the emergency department and the two community health centers, it was found that continuity of care is often not achieved. Sharing information electronically between emergency departments and primary care providers has the potential to diminish these errors and to improve patient safety. Over five quarters, health care providers in participating centers improved the frequency of recording asthma on the problem list, categorizing asthma severity and adherence to guidelines for appropriate pharmacologic interventions.

Health care quality, patient safety, and utilization efficiency can be dramatically increased with the collection and exchange of patient specific electronic health care data from all points along the continuum of care. HIE will be possible only if participating providers and other stakeholders adopt data interchange standards and, just as importantly, only if consumers and organizations understand how it will work and how privacy and security will be ensured.

Preexisting organizational dysfunction and/or inadequacies are amplified during the implementation process. Administrative units in which there was preexisting lack of teamwork find that the condition is exacerbated by the implementation of EHRs. An individual's level of comfort with the use of computers had mild to moderate impact on willingness to use EHRs; however, carefully designed training can overcome resistance to EHRs. The physical location and the amount of physical space for computer use have substantial effects on utilization. The sustained involvement of a "consistent champion" who is onsite, computer knowledgeable, and of relatively high status in the health care hierarchy greatly enhances the chances of a successful implementation.

Selected Outputs

Hsiao A, Shiffman RN. Dropping the baton during the handoff from emergency department to primary care. *Jt Comm J Qual Patient Saf.* 2009 Sep;35(9):467-74.

Tolomeo C, Shiffman RN, Bazy-Asaad A. Electronic Medical Records in a sub-specialty practice: one asthma center's experience. *J Asthma*. 2008 Nov;45(9):849-51.

Grantee's Most Recent Self-Reported Quarterly Status (as of December 2007): This project is complete.

Milestones: Progress is mostly on track.

Budget: Somewhat underspent, approximately 5 to 20 percent.