

Secure Architecture for Exchanging Health Information

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Organization:	Fallon Clinic
Mechanism:	RFA: HS04-011: Transforming Healthcare Quality Through Information Technology (THQIT)
Grant Number:	UC1 HS 015220
Project Period:	September 2004 – September 2009, Including No-Cost Extension
AHRQ Funding Amount:	\$1,499,999
Summary Status as of:	September 2009, Conclusion of Grant

Target Population: General

Summary: The project implemented and evaluated a financially sustainable health information exchange (HIE). Secure Architecture for Exchanging Health Information (SAFEHealth) is an HIE for patients, health care providers, payers, and public health agencies of central Massachusetts. The long-term goals of SAFEHealth are to improve health care quality and safety while reducing health care costs.

The ongoing project, piloted through the Fallon Clinic, Milford Hospital, and the HealthAlliance Hospital's Leominster Campus Emergency Room, interfaces with preexisting electronic medical record (EMR) systems. SAFEHealth developed policies and procedures to ensure compliance with Health Insurance Portability and Accountability Act (HIPAA) privacy and security rules. Using nationally accepted data exchange standards and a federated, decentralized edge proxy-server approach to authentication, data repositories, and an enterprise master person index (EMPI), SAFEHealth provides a secure, scalable, and sustainable HIE model that can be replicated and interfaced to other HIEs. Unique to SAFEHealth is an infrastructure hybrid approach to manage patient consent, allowing clinical data to flow for order and result processing in accordance with the treatment, payment, and operational provisions of HIPAA, and for the push and pull of clinical data based on opt-in consent. The system also supports cross-population queries and public health reporting.

Functional requirements for the HIE are based on findings from focus groups, stakeholder interviews, and an extensive literature review. After several unsuccessful attempts to find a vendor to develop the software, the project team decided to scale down software development to be developed internally by Fallon Clinic's information technology staff. The participating organizations agreed to share the development and implementation costs, including providing resources for testing the software.

Workgroups were created to define and develop data standards, policies, and procedures. Forms for universal consent and revocation of authorization were created and approved by the participating organizations. Patients received general education through the SAFEHealth.org Web site, newspaper articles, advertisements, and posters in the waiting rooms. They also received individual education and brochures from the registration clerks when obtaining consent.

Specific Aims:

- Conduct pre-implementation focus groups with patients and physicians. **(Achieved)**
- Develop software algorithms to allow information from three different entities to interface and integrate in the SAFEHealth environment. **(Achieved)**

- Develop working policy and procedures to assure compliance with HIPAA privacy and security rules. **(Achieved)**
- Implement and use SAFEHealth at Milford Hospital and HealthAlliance Hospital's Leominster Campus Emergency Department. **(Achieved)**

2009 Activities: SAFEHealth software development was completed in June 2009 and SAFEHealth became fully operational on June 24, 2009, using a federated edge-proxy server architecture with patient opt-in for clinical data exchange managed by a consent engine external to the EMR. A central EMPI was pre-loaded with the demographic information (name, sex, date of birth, and zip code) for one million patients. HealthAlliance Hospital's Leominster Campus Emergency Department provided emergency room notes, while Fallon Clinic provided 2 years of historical notes, including medication lists, allergies, problem lists, immunizations, code and advanced directive status, vital signs, recent laboratory and radiology results, and the primary care physician's name and phone number. Clinical data were imported directly into the receiving organization's EMR for use during treatment. Physicians and staff were subsequently surveyed in December 2009 on the impact of SAFEHealth.

After 15 weeks of use, 750 patients had consented and approximately 6,000 clinical documents had been exchanged. Patient focus groups revealed that patients overwhelmingly thought the benefit of HIE outweighed any security risk, but formal consent should be obtained from each patient (i.e., opt-in) prior to the exchange of any clinical data. Physician focus groups revealed concerns about information overload and liability, but overall, they rated the SAFEHealth concept highly.

Grantee's Most Recent Self-Reported Quarterly Status (as of September 2009): The project term is complete with all major aims achieved.

Impact and Findings: Approximately 50 percent of patients consented to share their records with any health care organization in Massachusetts that cares for them, and 70 percent agreed to allow information from their health insurer to be shared with their health care providers. Interviews with the registration clerks provided insight to the reasons for the low, 50 percent consent rate (as compared to the 95 percent consent rate demonstrated in the Massachusetts eHealth Collaborative communities). Currently, only two organizations are connected to SAFEHealth and had more health care providers participated, more patients would likely have consented. This suggests the need for the expansion of SAFEHealth to other organizations and more generalized marketing of the HIE concept and its benefits.

Overall, physicians found SAFEHealth valuable, although they did identify room for improvement. While finding information in their EMR was more convenient than having to call for records or accessing information through a separate Web site, organization of information could be improved (e.g., laboratory results in the laboratory section). Subsequent testing of an enhanced interface that provided this functionality led to improved physician satisfaction. The physician focus groups yielded unexpected findings, including some distrust of secure e-mail. Not surprisingly, younger physicians tended to be more comfortable with the technology. Decision support received mixed reviews overall. Message overload and liability were issues of great concern among physicians.

The cost of implementation and financial sustainability of HIEs is an ongoing concern for health care organizations that are considering HIE networks. The experiences of this project strongly suggest that close collaboration among the partners with existing human and capital resources is an effective and sustainable approach. Lastly, integrating an HIE into the real-life health care workflows of patients, registration clerks,

and physicians is a critical success factor. By using a central EMPI and repository outside the EMR, patients can sign a single universal consent form. System functionality that supports automated printing of patient consent forms improved and simplified registration workflows.

More detail on the project findings is included in Dr. Garber's final report: [Garber 2009 Final Report](#).

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

Business Goal: Implementation and Use