

## **AHRQ Grant Final Progress Report**

### **Electronic Communications Across Provider Settings**

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## **Structured Abstract**

### **Purpose**

Health Information Technology (HIT) has proven links to improved quality of patient care and the reduction of adverse events. The Electronic Communications Across Provider Settings (ECAPS) project examined how HIT could improve the quality of patient care and increase communication across diverse provider settings.

### **Scope**

The planning for ECAPS occurred in two rural settings. In the Concord area, teams met to discuss how critical patient information could be synchronized among a variety of healthcare settings operating in the Concord community.

Planning in six rural community health centers throughout New Hampshire led to the idea of distributing electronic clinical information into a statewide clinical repository.

### **Methods**

A medication reconciliation pilot was completed. In the pilot, patient medication, allergy, and problem lists were shared between primary care physician offices and surgeons' offices preoperatively for outpatient surgery.

A secure messaging pilot examined the effectiveness of using secure messaging to communicate referrals between primary care and specialty offices.

Finally, a plan for measuring adverse drug events was created.

### **Results**

The planning teams concluded that patient information documented in one EMR (e.g., new medication prescribed) must be distributed to other EMRs, where it would be accepted and added to the local record. The act of capturing, distributing, and inputting data would be as unobtrusive as possible, limiting the amount of effort expended by people. The proposed solution would automate the exchange of information between EMRs, except when human intervention is desirable.

### **Key Words**

Health Information Technology; Secure Messaging; Communication; Clinical Repository

### **Purpose**

HIT has proven links to improved quality of patient care and the reduction of adverse events. Interoperable HIT structures allow not only for site-specific technology utilization but also for effective HIT communication across provider sites. This in turn enables providers and clinicians to access longitudinal data that follows the patient through the system and across care sites. Such systems have been shown to decrease the incidence of adverse medical events, facilitate communication, and decrease overall system costs, all of which lead to increased quality of care. The overall goal of the ECAPS project is to improve the quality and safety of patient care by improving communication by using HIT across diverse provider settings. ECAPS seeks to improve the quality of care by adding efficiency and accuracy to medication management. Using medication as the focus, the project will address the issue of hindered communication of up-to-date clinical data that results from patient information existing in "silo" information systems that do not communicate with one another. Thus, this project seeks to leverage the data in each organization's existing HIT into a dynamic, patient-centered system in which a patient's clinical data is current and complete in each setting of care. This system will enhance each provider's ability to provide the best care possible.

This work will occur in two rural settings. One environment is the Concord Hospital catchment area. The work in this setting will promote efficiencies in patient care by allowing information obtained in one venue to be shared across multiple agencies without requiring the provider to initiate the communication or have an awareness of all the members of the patient care team. The settings included Concord Hospital, Concord Regional Visiting Nurse Association, Riverbend Mental Health, and a number of physician offices. The second setting is across six community health centers across New Hampshire. ECAPS will allow the multiple health center sites to link data from their electronic medical record into a centrally located data collection system that will provide aggregate information on the vulnerable populations (underinsured and uninsured) that are cared for primarily at those health centers. This central repository will also serve as a mechanism to implement disease management registry (DMR) software that will enhance outreach within these communities to another vulnerable population – the chronically ill.

Patient safety is an important public health issue. This project seeks to demonstrate the utility of technologies that can impact the public's health by creating systems that can be used to address potential medication errors and improve patient care.

### **Scope**

The following committee structures were established to facilitate the planning efforts:

**Steering Committee** – This committee met to oversee the planning process. The Steering Committee integrated recommendations from the subcommittees into a realistic, achievable, and measurable multiyear implementation plan. The principal investigator led the steering committee, of which membership included senior leadership from the partner organizations.

**Clinical Committee** – This committee, chaired by a physician, was composed of clinical practitioners from each of the partner organizations. They provided the vision and direction for the implementation plan. The group reviewed workflows among their organizations and identified areas of need. The group focused on four questions at its first meeting:

1. What aspects of patient safety and/or quality of care do you and your organization excel at?
2. What aspects of patient safety and/or quality of care would you most like to improve?
3. What aspects of patient safety and/or quality of care are you and your organization most passionate about?
4. Reviewing the list of organizations represented in this meeting, what could we do together to improve patient safety and/or quality of care for our shared patient population?

**Technology Committee** – This committee evaluated available technologies to support the objectives established by the Clinical Committee. The group made technology recommendations and provided time and cost estimates for the implementation plan. The group consisted of system analysts and network engineers from each partner organization.

**Health Center Committee** – This committee, composed of providers and administrators from the community health centers, met to evaluate the needs of the community health centers.

**Confidentiality/Privacy Committee** – Several members of this committee met to discuss the issues regarding patient confidentiality and data security.

Site-specific needs assessments were completed at each partner organization. These assessments focused on the medication capture mechanisms for each site to reflect the project's focus on medication management. It is clear that the information technology systems vary among the partner organizations in our community. Centricity EMR from GE is installed in the physician practices. Coded medications are entered, and prescriptions are generated at the time of the patient office visit. At the Concord Regional Visiting Nurse Association, Horizon Homecare from McKesson allows clinicians to maintain coded medication lists. Medications are updated and drug interaction checking is done from the patient's home. TIER from Sequest technologies is used at Riverbend Community Mental Health Center. TIER does not provide a medication module; instead, medication information is typed into the provider office note. Therefore, Riverbend needs the ability to capture coded medications at the time of visit, produce electronic prescriptions, and perform drug interaction checking. Sequest technologies announced the development of a medication module in an upcoming release, which would allow Riverbend to adopt a medication module. At Concord Hospital, Horizon Clinical Documentation from McKesson is used for medication administration and clinical documentation in the hospital. However, a medication reconciliation module is also needed at Concord Hospital.

Looking at the health centers, we learned that two remaining health centers without an EMR (Valley Regional and White Mountain) are interested in the technology but do not have the resources to implement an EMR. Implementing this technology is an important first step in the capture of discrete medication information. Bringing those health centers on to the Centricity EMR would create a situation in which all the health centers across the state are using the same EMR. Although the other health centers involved in the ECAPS project (Capital Region Family Health Center, Avis Goodwin, Health First, and Coos County) do have an EMR, they lack an automated mechanism for medication coordination. All these sites are interested in implementing disease management software to interface with the EMR data to create medication reports.

## **Methods**

### **A Medication Reconciliation Pilot**

A Collaborative Medication Management pilot between surgeon groups and primary care practices was conducted at Concord Hospital. In the pilot, patient medication, allergy, and problem lists were shared between primary care physician offices and surgeons' offices preoperatively for outpatient surgery. The results of the pilot have shown important variation in the on-time rate of return of the forms being used to verify medication lists. Though some practices had a 100% on-time return of the forms, other EHRs had a 33% return rate.

### **A Secure Messaging Pilot**

Another EHR pilot was conducted at Concord Hospital to send referrals between two sites. Although it has been shown that the referrals can successfully be created and sent across sites, the technology has been used only on a limited basis due to the burdensome and impractical number of steps required. This burden includes multiple log-ins to databases, multiple searches for patients, and manual updating of clinical lists.

### **A Plan for Measuring ADEs**

We believe that enhanced communication among providers in the Concord community will have a positive impact on ADEs. A small team of providers has met to outline a plan for gathering ADE information from the partner systems.

The criteria they established were simple. They wanted the measurements to be meaningful in practical terms to the clinical outcomes of patients for which they provide care. They recommended a three-step approach to members of the project team.

#### **Step 1:**

Generate a report of the top 50 medications prescribed within our PCP practices, the hospital, homecare, and behavioral health settings.

#### **Step 2:**

From these reports, tease out the "high-risk" drugs and drugs for which there is evidence-based consensus on surveillance labs or adverse symptoms.

#### **Step 3:**

Once the "high-risk" drugs are identified, develop reports that look at patients who are on each of these drugs and meet one or more of the following:

- Patient has presented with A, B symptoms and/or
- Patient has C, D labs ordered for surveillance and/or
- Patient has E, F lab results that signify a possible problem.

Here is an example:

Patient sees Dr. Jones for hyperlipidemia and is on a statin drug. The report would look to see if he presented with symptoms of drug induced hepatitis (jaundice, etc.) and would

look at whether he has had his LFTs checked in the past 6 months. The report would also look at whether his LFTs were elevated or if he had an elevated CPK.

We believe that identifying medications that are used at a high frequency by our partners will increase buy-in to the process, because it reflects their current practice and not a remote study.

## **Results**

Our pilot studies have shown that, in order to be successful, the system must have minimal impact to provider workflow and not depend on the provider knowing all the members of the patient's healthcare team. The selected system will need to provide the flexibility necessary to accommodate the disparate HIT of the partners. Given these needs, we concentrated on the development of a system with architecture that is open and automates the process of alerting other providers to changes that have occurred. This automated system represented a departure from our initial plan that included the use of secure messaging technology and, ultimately, a data repository for medication management. We recognized that increased workload would present a major barrier to the acceptance of a medication reconciliation system.

Given these findings, we worked with Novo Innovations, Inc., to help us develop the technology needed to automate the sharing of clinical information among disparate systems. The following is an excerpt from the Novo proposal, titled "Electronic Health Record Integration Project":

The goal of the project is to ensure that critical patient information is synchronized among a variety of EHRs operating in the Concord Community. As patient information is documented in one EHR (e.g., new medication prescribed), it must be distributed to other EHRs, where it can be accepted and added to the local record.

The act of capturing, distributing, and inputting data must be as unobtrusive as possible, limiting the amount of effort expended by people. The proposed solution will automate the exchange of information between EHRs, except when human intervention is desirable (e.g., determining what data is saved in the EHR patient chart).

The solution must work with existing applications. This will require the utilization of a variety of methods and techniques to capture data from the EHR where data originates and input into the receiving EHRs.

The scope of the project is to enable the capture and synchronization of patient data including problems, allergies, and medications among a variety of EHRs.

Patient information must be shared among hospital, primary care, home care, behavioral health, and specialty care providers.

To create the environment, the project will implement the Novo Grid Computing Architecture (GCA) along with the emerging ASTM Continuity of Care Record (CCR) standard to:

- Extract/capture and input data to/from local EHRs
- Securely distribute data between EHRs
- Organize data in a structured way that maintains context and integrity
- Provide multiple levels of security including auditing
- Allow providers the ability to select data to input into a local EHR

Key Success Factors – the project must address and resolve several areas to be successful:

- Events – when is the information acquired and distributed?
- Extraction – how is the data acquired from the local EHR?
- Patient matching – who is the patient, who has interest in the patient?
- Intervention – how do providers receive and accept data?
- Insertion – how is data input into the local EHR?

## **Findings**

- The principal investigator was able to get early buy-in from senior management at each organization.
- Vision and objectives were created with input from key stakeholders at home health, behavioral health, physician practices, hospital, pharmacy, IT, and quality assurance.
- Communication among all stakeholders is key to keeping people involved and invested in the vision.
- Workflow and culture change issues must be integrated into the planning process.
- Consumers must be shown the benefits of sharing information among healthcare providers.
- Patient confidentiality must be assured.
- The process must be automated as much as possible. It will be difficult to gain acceptance from providers if the process adds more work.

## **Barriers**

- Technical:
  - Software that automates the process of sharing information of problems, allergies, and medications does not exist today.
  - How will patient matching occur among disparate systems without a unique patient identifier?
  - We will need to provide patients with the opportunity to opt out of this process. How will a patient opt out of this process?
  - Information sharing affects a number of different systems and vendors. There are a number of people outside of the project committees who need to get up to speed on the vision of this project.
- Privacy Concerns:
  - Will patients be comfortable with sharing of clinical data among healthcare providers?
  - How do we instill confidence in patients that electronic data sharing is secure?
- Other:
  - Liability concerns among participating organizations.
  - Economic impact to participating organizations.
  - Limited availability of funds at the community health centers was overcome with promised funding from the Endowment for Health.

## **Conclusions**

We believe that the implementation of health information technology (HIT) will improve the quality of patient care and increase communication across diverse provider settings. We have a high penetration of the electronic medical record in our area and will continue to work on the process of moving data among these systems. The yearlong planning process has made clear the keys to success for this type of undertaking:

- Patients must be educated to the benefits of sharing clinical data among health systems. A sense of urgency must be created, and our vision must be communicated.
- Providers must be shown the benefits of this new system. We believe that automation of the system is vital to acceptance.
- Leadership in the partner organizations must push forward the vision of communication among the healthcare settings.
- Interoperable standards must be developed to allow for the exchange of discrete clinical data.

## **List of Publications and Products**

No publications.