

Project Title:	Patient-Centered Informatics System to Enhance Health Care in Rural Communities
Project Investigator:	Samore, Matthew, M.D.
Organization:	University of Utah
Mechanism:	RFA: HS07-007: Ambulatory Safety and Quality Program: Enabling Patient-Centered Care through Health Information Technology (PCC)
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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: This is a demonstration project to evaluate the effect of integrating the functions of an electronic medical record (EMR) and order entry tool, a personal health record (PHR), and a communication system on patient-centered care in rural communities in the Intermountain West. The group working on this project, which is approximately mid-way through its scheduled duration, is composed of computer software developers, academic researchers, physicians, and public health professionals. This system, called the Unified Health Resource (UHR) to highlight its focus on integration and patient-centric care, provides disease information and decision support tools for patient self-management of acute and chronic diseases, supports the reconciliation of medication lists, and enables exchange of information between clinicians and patients through a series of structured, bi-directional communication channels.

As patients and clinicians need to have ownership and control of their respective records, certain necessary design parameters have been identified, which include programming the UHR so that the EMR and PHR function independently of each other. The UHR software developer, CaduRx, designed an interface that allows each side to view and import changes to reflect the updates made by the other party. However, one side cannot alter the other's records. Patients may view items such as physician notes, diagnoses, and diagnostic test results imported into their PHR. Physicians who are granted access by the patient are able to view and import the patient's information from the PHR into their EMR, which may include new prescriptions, symptoms, or diseases. In addition, there are several types of structured e-visits patients can use to communicate with clinics and clinicians. Patients may request medication refills online, as well as input results of home monitoring tests into their PHR, such as blood sugar levels and blood pressure measurements.

To ensure that navigation through the system is easy and intuitive for both clinicians and patients, different approaches must be taken for the EMR and the PHR to meet the needs of the target users and still allow for a meaningful exchange of information between patient and provider. Through extensive usability testing, the project team has ensured that the vocabulary used in the PHR is understandable to the patients, clinically significant to the providers, linkable to International Classification of Diseases, Clinical Modification (ICD-9-CM) codes, and able to be coded for clinics' record keeping and billing purposes.

To assess the effect of the UHR on patient-centered care, the team will conduct a prospective cohort study among selected adult patients within one of the two rural clinics that use the UHR or two comparable clinics that recently implemented another EMR system. Participants must have one or more of the following chronic illnesses: diabetes mellitus, hypertension, chronic heart disease, or chronic obstructive pulmonary disease. Study cohort participants will complete a baseline and two follow-up surveys consisting of questions from validated surveys as well as internally developed questions. Along with this patient self-reported data, the team will analyze electronic data abstracted from the databases of the UHR, and a manual chart review of the patients' medical records to compare the provider's assessment of a patient's disease management with the patient's report of how well they self-managed. The project team will consider this intervention successful with respect to enhancing patient-centered care if patients report increased access to care and satisfaction with communication; if patient activation as health care consumers is improved; and if self-management behaviors and safe and effective medication practices rise in frequency. In addition to the comparative study, the project team is conducting a formative evaluation of the UHR, which has included usability testing, direct interaction with users of the UHR, and monitoring of utilization data.

Specific Aims

- Recruit two rural primary care clinics that use UHR and two primary care clinics that use an alternative, non-UHR EMR system to participate in a 3-year research demonstration project. **(Ongoing)**
- Apply formative evaluation methods to assess and improve usability, usefulness, and adoption of the UHR personal health system by patients. **(Ongoing)**
- Enroll patients from the four participating rural clinics into a prospective cohort study to assess the impact of the UHR personal health system on patient-centered care. **(Ongoing)**
- Examine patterns of use of the UHR personal health system. **(Ongoing)**
- Increase awareness, confidence, and skills to use personal health records and Internet health resources among rural community residents, leveraging local libraries and health departments. **(Upcoming)**

2008 Activities: Many activities have been undertaken to support development and testing of the UHR. The project team conducted a literature review and solicited expert feedback to develop the data collection tools for the project. The project team has tested and evaluated the tools to ensure their reliability and validity. The team has completed a patient usability beta test of the UHR to identify additional modifications to be made to the tool, forming a "super-user" group from those in the beta test for additional feedback. This work helped in developing the formal usability testing now in progress. The project team has identified and recruited both UHR and non-UHR comparison study sites. HealthInsight, a study partner, has worked one-on-one with the clinic sites to support integration of the EMR into the organization's workflow. The project team has organized key individuals from each of the organizations working on the project to evaluate the level of adoption of the UHR in the study clinics and prepare them to respond to patient-initiated communication through the UHR.

Development of the UHR has gone through several iterations of planning, testing, and evaluation. The team has collected and analyzed qualitative and utilization data through a round of beta testing, individual patient pilot tests, and provider surveys to identify further required modifications to the UHR and the study protocols. The UHR software developers at CaduRx have tested their programming for internal consistency and operation errors. The UHR was then tested by the team's practicing physician to ensure the system met the needs of health care providers, and tested by public health professionals to ensure that the patient perspective and vocabulary are represented. The project team has made progress in developing methods of presenting information to patients that is significant to clinicians. The team is developing their

strategy to anticipate patients' approaches in documenting their health and health care information, as compared with how this information needs to be recorded in the clinics' medical records.

Preliminary Impact and Findings: Through the project team's recruitment efforts, members have collected anecdotal evidence that patients are very interested in having a PHR linked with their health care provider and to their clinic records. The team anticipates a challenge in ensuring that patients are aware of how the tool is integrated with the clinic and understand how to use it successfully. Patients who are chronically ill but have low levels of computer literacy may benefit from more structured training, as learned through the beta testing and patient pilot testing. The clinic staff might be ideal teachers for their patients on the use of the UHR. The project team anticipates that working with the staff may complement the project's dissemination aim.

Selected Outputs

Priority matrix for software developed based on beta tester's feedback.

Script and protocol for formative usability testing.

Grantee's Most Recent Self-Reported Quarterly Status: Progress is on track in some respects but not others.

Milestones: Progress is on track in some respects but not others.

Budget: Significantly under spent, more than 20 percent.