

Expanding CER Capability through Complex Patient Relationship Management

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Infrastructure Description

This project created a technology infrastructure for bi-directional text message communication between providers and patients, including a link to the electronic medical record (EMR). The infrastructure allowed for the collection of self-reported health data from complex patients between clinic visits and targeted outreach to at-risk patients. Patient-reported data are automatically incorporated into the EMR to inform providers.

Specific Aims

1. Expand administrative and clinical data warehouse infrastructure capacity of an urban healthcare system to create a research database for observational comparative effectiveness research (CER) on complex patients.
2. Create and document a comprehensive set of guidelines, strategies, and reporting mechanisms to promote effective use and dissemination of the research database.
3. Conduct CER studies to determine whether patient care improves when chronic conditions are managed through customized, integrated system reports and automated text messaging communications.

Pilot Study

This nine-month study (N=135) tested the feasibility and usefulness of this newly developed infrastructure. Patients with diabetes were prompted by text message to report blood sugar, blood pressure and step count data back by text message. System links to laboratory and pharmacy data identified patients overdue for lab tests and medications, and those patients were sent automated outreach messages. Focus groups were held with participating patients to assess satisfaction.

Infrastructure Goal

Create technology infrastructure for bi-directional text message communications between patients and providers, linked to the electronic medical record.

Data Sources

Self-reported (by text messaging from home) blood sugar, blood pressure, and step count measurements.

Administrative and clinical data warehouse at the Denver Health and Hospital Authority.

Data Access

Data are hosted at REDCap: <http://project-redcap.org/>. A data use agreement with Denver Health is required to access data.

Strategies Addressed from the HHS Strategic Framework on Multiple Chronic Conditions

- 1.D. Implement and effectively use HIT
- 1.F. Evaluate models of care, incentives, and other health system interventions
- 4.C. Increase clinical research

Expanding CER Capability through Complex Patient Relationship Management (continued)

Patients successfully provided more than 6,000 home measurements of health data (i.e., blood sugar, blood pressure, and step counts), which were automatically transferred to the EMR. Automated outreach to patients overdue for lab tests and medications was achieved, but gaps in pharmacy data required manual quality review. Participants reported improved awareness of their chronic disease status and enhanced self-management skills.

This feasibility study demonstrated that mobile technology has the potential to improve health care quality, clinical outcomes, and patient satisfaction, while reducing overall healthcare costs by helping to engage patients in the management of their chronic illnesses between clinic visits.

Publications (as of September 2013)

Grembowski DE, Schaefer J, Johnson K, Fischer H, Moore SL, Tai-Seale M, Ricciardi R, Fraser JR, Miller D, LeRoy L. The AHRQ Multiple Chronic Conditions Research Network conceptual model for research on complex patient care. *Medical Care*. In Press, 2014.

Fischer HH, Moore SL, Ginosar D, Davidson AJ, Rice-Peterson CM, Durfee MJ, MacKenzie TD, Estacio, RO, Steele, AW. Care by cell phone: Text messaging for chronic disease management. *American Journal of Managed Care*. 2012; 18(2): e42-47.

Fischer H. Guide to SMS text-message based bidirectional communication for chronic disease management. 2012. Available from <http://dx.doi.org/10.3886/ICPSR34352.v1>.

Posters and Presentations

Steele A, Fischer H, Moore S, Berschling J, Brekke L, Rice-Peterson C, Medford A, Davidson A. Development of a data infrastructure to support text messaging use for patient-provider communication and automated integration of patient-reported information into an EHR. Poster Presented at: Informatics: Transforming Health and Healthcare. American Medical Informatics Association Annual Symposium; 2012 Nov 3-7; Chicago, IL.

Fischer HH, Moore SL, Ginosar D, Durfee MJ, Davidson AJ, Rice-Peterson CC, Berschling JD, MacKenzie TD, Estacio RO, Steele AW. Integrated mobile technology infrastructure for chronic disease management. Poster presented at: Leveraging Knowledge and Action to Improve Health Care Quality. 6th Annual Conference of the Agency for Healthcare Research and Quality; 2012 Sept 9-12; Bethesda, MD.

Steele A, Fischer H, Moore S, Ginosar D, Durfee M, Estacio R. Promoting chronic condition management through mobile technology. Poster presented at: Social Justice: A Public Health Imperative. 139th Annual Meeting & Exposition of the American Public Health Association; 2011 Nov 6-10; Denver, CO.

Fischer H, Moore S, Ginosar D, Davidson A, Durfee M, Rice-Peterson C, MacKenzie T, Estacio R, Steele A. Promoting chronic disease management through mobile technology. Poster presented at: 5th Annual Conference of the Agency for Healthcare Research and Quality; 2011 Sept 18-21; Bethesda, MD.

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Fischer H, Moor S, Ginosar D, Durfee M, Rice-Peterson C, MacKenzie T, Estacio R, Steele A. Promoting chronic disease management through mobile technology. Poster presented at: 34th Annual Meeting of the Society for General Internal Medicine; 2011 May 4-7; Phoenix, AZ.