

Project Title:	Health Information Technology-Based Regional Medication Management Pharmacy System
Principal Investigator:	Schmidt, Mark D., B.S.
Organization:	Cloquet Community Memorial Hospital
Mechanism:	RFA: HS04-011: Transforming Health Care Quality through Information Technology (THQIT) – Implementation Grants
Grant Number:	UC1 HS 014965
Project Period:	09/04 – 09/07
AHRQ Funding Amount:	\$1,374,616
Summary Status as of:	September 2007, Completion 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: One approach for improving patient outcomes is to implement information and communications technologies that link rural health care providers with urban-based health care expertise. Providing rural practitioners with access to clinical knowledge and specialized expertise that is not generally available in remote, sparsely populated areas can improve the effectiveness of caregivers and the safe use of medications.

This grant enables eight Wilderness Coalition member critical access hospitals (CAHs) to obtain the technology that allows pharmacy staff at local ‘hub’ hospital St. Luke’s Hospital in Duluth, Minnesota—a tertiary care Level II trauma center with around-the-clock pharmacist staffing—to electronically enter orders into rural hospitals’ patient electronic medical records. The system populates these orders into patients’ medication profiles on automated dispensing cabinets located at seven of the eight CAHs. Participating rural Minnesota communities are Two Harbors, Moose Lake, Aitkin, Cloquet, Bigfork, Cook, Deer River, and Ely.

The evaluation for the project was based upon Donabedian’s model for evaluating the quality of health care services. An initial list of 15 metrics across the 3 Donabedian assessment domains of structure, process, and outcomes was narrowed to a final list of 7 following consultation with the Agency for Healthcare Research and Quality’s Health Information Technology National Resource Center (NRC). The NRC’s Evaluation Metric Importance/Feasibility Matrix was used to identify metrics for which data were readily available or readily retrievable from the MEDITECH software. Evaluation plans were reviewed by the institutional review boards of St. Luke’s Hospital and the University of Minnesota.

Results at the end of the grant period show that the after-hours remote pharmacy order entry (ARPOE) system used by the hospitals generally had a positive impact on the structure, process, and outcome metrics. Around-the-clock pharmacist coverage at the rural hospitals has been nearly fully achieved and implementation of standardized ARPOE policies and procedures is progressing well.

Specific Aims

- Improve quality of service and safety and health of the patients at participating hospitals by making professional pharmacy services available for round-the-clock medication consultation and dispensing. **(Achieved)**
- Develop a shared pharmacy program that will afford small rural hospitals the quality of

professional services described above. (**Achieved**)

2007 Activities: Clinical messages from June 2007 through September 2007 were analyzed. Lag time data could not be collected because faulty time settings on fax machines at the remote hospitals marked incorrect times on medication orders. Override codes from the automated dispensing machines at the remote hospitals were recorded in place of the lag time measures. The codes were reviewed to determine when and why nursing staff were retrieving newly-ordered medications prior to pharmacist review of the new orders.

Impact and Findings: The impact of pharmacist intervention on patient care was measured by reviewing the MEDITECH clinical messages transmitted by St. Luke pharmacists to nursing staff, pharmacists, and/or prescribers at the rural hospitals. In the first 20 months of the project, more than 700 pharmacist interventions were documented through clinical messages, most often preventing a drug from being administered for which the patient had a contraindication (191 occurrences) or preventing an excessive dose of a drug from being administered (172 occurrences).

Nurses, pharmacists, and prescribers at the rural hospitals were surveyed prior to the implementation of the ARPOE system and after all rural hospitals had gained several months of experience with the system. Post-implementation improvements were reported in the areas of timeliness and usefulness of responses to drug information questions, overall availability and helpfulness of pharmacists, staff interactions at both on-site and hub hospital pharmacies, quality of patient care provided by pharmacists, communications between the nursing and pharmacy departments, and overall satisfaction with pharmacy services.

At two sites, the rural pharmacists noted that it was helpful, after a weekend or holiday, to find all of the data entered into the system, doses dispensed, and order-related questions resolved. Clinical messages allowed hub hospital pharmacists to alert rural pharmacists immediately about any medication-related issues they might need to handle.

Pharmacists at the hub hospital identified more than 700 potential drug therapy problems for patients in rural hospitals. It is difficult to predict how many of the ordered medications would have actually been administered had the hub hospital pharmacist not intervened, or the number of resultant patient injuries had these medications been administered. Results to date suggest that hub hospital pharmacist involvement in the ARPOE system improved patient care by providing safer and more effective medication therapy than if there had been no pharmacist involvement. These results support the National Quality Forum's recommendation to have the pharmacist involved in the prescribing process at the time the prescription is written.

Harmonization of medication order-related dictionaries between the hub hospital and the rural facilities has proven particularly vexing because of different abbreviation codes in each rural hospital's MEDITECH drug dictionary. Standardization of remote order entry policies and procedures among the participating hospitals continues.

Scheduling coverage for the rural hospitals was challenging when a major holiday fell on a Sunday. Although the rural hospital arranged for the hub hospital pharmacy to provide coverage during the actual holiday, staff at the rural hospital pharmacies occasionally forgot to schedule coverage for the following Monday, which many rural hospital pharmacists took off in observance of the Sunday holiday.

Selected Outputs

Stratton TP, Worley MM, Schmidt M, et al. Implementing after-hours pharmacy coverage for critical access hospitals in northeast Minnesota. *Am J Health Syst Pharm.* 2008 Sep 15;65(18):1727-34.

Grantee's Most Recent Self-Reported Quarterly Status (as of September 2007): At the end of the grant period, all major aims were completed, with data analysis ongoing.

Milestones: Progress is mostly on track.

Budget: Spending is roughly on target.