

Project Title: Detecting Med (Medication) Errors in Rural Hospitals Using Technology
Principal Investigator: Brown, C. Andrew, M.D., M.P.H.
Organization: University of Mississippi Medical Center
Mechanism: RFA: HS04-011: Transforming Health Care Quality through Information Technology (THQIT)
Grant Number: UC1 HS 015400
Project Period: 09/04 – 08/08, Including No-Cost Extension
AHRQ Funding Amount: \$1,222,089
Summary Status as of: August 2008, Conclusion of Grant

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve the quality and safety of medication management via the integration and utilization of medication management systems and technologies.

Business Goal: Implementation and Use

Summary: In 2004, the Patient Safety Center at the University of Mississippi Medical Center was awarded this grant to set up a rural hospital medication error reporting network. Eight rural hospitals, including five in the Mississippi Delta and three in east central Mississippi, were recruited to participate in the project. Six of the eight were critical access care hospitals, having fewer than 25 beds. The largest hospital had 69 licensed beds; the smallest had 8 beds. In year one, an analysis focusing on technology capacity, physical space, personnel, and current medical error reporting practices was conducted. After collecting data, an educational and implementation strategy was developed. The customized educational courses that were created included continuing education (CE) and continuing medical education (CME) credits focusing on the importance of reporting medication errors and use of a Web-based medical error reporting system. Of the 210 direct care providers, 198 attended educational seminars and received CE or CME credit. In year two, an interoperable frame relay network using fractional T1 lines—bundles of normal phone lines functioning as a single data channel—and computer hardware and software was installed in each of the eight rural hospitals. The network became fully functional on January 1, 2006. Data were collected from this date until August 31, 2008; in total, 805 errors were documented.

Specific Aims

- Introduce voluntary, anonymous, electronic medical error and adverse drug event (ADE) reporting in eight small, rural hospitals (fewer than 100 beds) in Mississippi. **(Achieved)**
- Identify barriers to implementation of health IT, including educational, cultural, technological, and intangible issues, such as reticence and resistance. **(Achieved)**
- Ascertain the epidemiology and root cause of medical errors and ADEs in small, rural hospitals. **(Achieved)**
- Formulate educational and continuous quality improvement (CQI) strategies that are specific to small, rural hospitals in partnership with participating hospitals. **(Achieved)**
- Develop, demonstrate, and evaluate strategies in partnership with the participating institutions for reducing errors and, ultimately, improving patient safety throughout Mississippi, and by extension, in other rural areas, based on the data gathered. **(Achieved)**
- Disseminate the research results and the quality improvement strategies developed in partnership with participating institutions throughout the health care industry. **(Ongoing*)**

** This aim was not completed prior to scheduled conclusion of the grant, August 2008, yet, as other sources of funding have been secured, it is still targeted for completion.*

2008 Activities: The grantee continued to offer technical support for the error-reporting system throughout the project; data collection, ongoing since 2006, closed on August 31, 2008. Data analysis and interpretation are ongoing.

Preliminary Impact and Findings: To date, academic efforts have been focused on barriers encountered while implementing an electronic reporting system in a very rural, impoverished area of the United States. Some data analyses and interpretation of findings have begun. Three barriers to the adoption of new technology have been identified that may be specific to rural areas: personnel, physical space, and Internet access. For rural providers, the previously recognized barrier of cost is closely tied to personnel time—time is money. It is essential to assure hospital administrators that the reporting system is easy to learn, easy to use, and saves time in reporting medication errors, and that quality assurance reports will be provided, thus lessening time demand and responsibilities for the quality assurance director. Initially, the Internet was planned to be the sole means through which our medication error reporting system could be accessed. However, since not all direct care providers in the rural network had access to the Internet, T1 lines and the ClearCube technology were used to provide access to the medication error reporting system. It was learned that in Mississippi, rural hospitals are enthusiastic about participating in technology projects. Both administrators and staff are more knowledgeable about the benefits and governmental initiatives to create an interoperable information infrastructure than was initially assumed. Prior to starting this project, a leading private health care agency in the State commented that we would “be lucky to find eight hospitals to participate and, even if we did find eight, they would not use our system.” In fact, 35 hospitals volunteered to participate in the study. It was learned that, although implementation of technology may be different in rural settings, technology can make measurable improvements in patient safety. As in urban areas, the overall impact of the adoption and implementation of new technology in reporting medication errors has the potential to improve patient safety and patient care in rural areas.

Selected Outputs

Rudman W, Burke-Bebee S, Hart-Hester S, et al. Patient safety and patient care among small rural physician offices: the impact of electronic medical record adoption on medical error reduction, patient care, and cost reduction. *J Am Med Inform Assoc* (Submitted).

Miller-Davis P, Brown CA, Rudman W, et al. “Blunt end/sharp end” perceptions of patient safety culture: a practical approach to developing performance improvement initiatives. *Acad Med* (Submitted).

Rudman W, Hart-Hester S, Brown CA, et al. Factors Affecting the Adoption of EHR: The Use of Bayesian Models in Assessing EHR Adoption. National Rural Health Association 14th Annual Rural Minority and Multicultural Health Conference; December 2008; Albuquerque, NM.

Rudman W, Hart-Hester S, Brown CA, et al. Mississippi HIT Initiatives. National Oral Health Conference; April 2008; Miami, FL.

Rudman W, Hart-Hester S, Brown CA, et al. Research Reviews and Secondary Analysis. In: Watzlaf V and Layman E, eds. *Research in Health Information Management*; April 2008.

Rudman W, Hart-Hester S, Brown CA, et al. HIT/HIE/EMR Trends and Updates. Healthcare Financial Management Association Summer Meetings; August 2007; Philadelphia, PA.

Rudman W, Burke-Bebee S, Hart-Hester S, et al. Patient Safety and Patient Care among Small Rural Physician Offices: The Impact of Electronic Medical Record Adoption on Medical Error Reduction, Patient Care, and Cost Reduction. AHRQ Annual Conference; September 2008; Bethesda, MD.

Grantee’s Most Recent Self-Reported Status: Findings are being prepared for publication.

Milestones: Progress is completely on track.

Budget: Spending is roughly on target.