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| <b>Project Title:</b>          | Improving Healthcare Quality via Information Technology                               |
| <b>Principal Investigator:</b> | Hayden, Avis, Ph.D.   |
| <b>Organization:</b>           | Southwest Vermont Health Care Corporation   |
| <b>Mechanism:</b>              | RFA: HS04-011: Transforming Healthcare Quality through Information Technology (THQIT) |
| <b>Grant Number:</b>           | UC1 HS 015270   |
| <b>Project Period:</b>         | 09/04 – 09/08, Including No-Cost Extension  |
| <b>AHRQ Funding Amount:</b>    | \$1,486,304   |
| <b>Summary Status as of:</b>   | September 2008, Conclusion of Grant   |

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**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:** Knowledge Creation

**Summary:** The purpose of this completed project was to reduce medical errors and adverse events at the Southwestern Vermont Medical Center (SVMC) through several information technology (IT) innovations, including the expansion of electronic health records (EHRs) at the hospital, the introduction of EHR practice management software to the community, the introduction of bedside medication verification and electronic medication administration records (eMARs), the use of recorded nurse-to-nurse shift reports, the implementation of computerized physician order entry (CPOE), and the implementation of Midas+ clinical decision support (CDS) software. In addition, SVMC undertook a major initiative to improve organizational culture around patient safety. Leadership made a conscious effort to shift organizational culture from one that discouraged disclosure and blamed individuals for medical errors to one that promotes disclosure, seeks out root causes, and implements systemic improvements in clinical practice to improve patient safety. The original scope of this project was to implement EHR technologies throughout SVHC’s several organizations and in privately-owned medical practices in the community. During the first year of implementation, however, it became clear that the proposed scope of work was a much larger and more complex task than had been originally anticipated. Therefore, the scope of the project was tightened, focusing Year 2 only on the introduction of EHRs and related technologies at the hospital. By Year 4, some issues with the implementation of EHRs in area private practices had been resolved, and again began to move forward, while implementation of EHRs at the hospital continued. For 6 months prior to the implementation of eMARs, during the 5-month implementation window, and for 5 months after full implementation, the head of Pharmacy examined all the medication-related events submitted through SVMC’s internal reporting system, based on self-report, and identified actual errors in transcription, administration, and near misses for the four types of medication errors: ordering, transcription, dispensing, and administration.

### Specific Aims

- Assess the development of a “culture of safety” through educational programs, administrative efforts, and the implementation of health IT. **(Achieved)**
- Develop a new protocol for nursing shift reports and assess its impact on completeness of reporting; implement voice recording technology to supplement the report and assess its effects. **(Achieved)**
- Implement bedside medication verification and electronic medication administration records, and assess their value in reducing errors. **(Achieved)**

**2008 Activities:** By 2008, EHR and nursing shift report care technologies had largely been implemented in the hospital setting. Implementation processes at local private practices had begun. Data collection and analysis were completed.

**Impact and Findings:** Surveys administered over the term of the grant, in 2005, 2007, and 2008, suggest that staff notions of patient safety have evolved in ways that mirror the efforts of the administration to promote improved communication, standardization of clinical practice, the use of IT, and the promotion of a “culture of safety” throughout the organization. Among both nurses and physicians in 2005, patient safety was largely understood as a matter of having the right professionals delivering the right kinds of care to patients. By 2008, while the prior understanding continued, it was joined by an increased focus on systems of communication, the importance of access to information, and a more frequently articulated sense that a “culture of safety” was important to the organization. However, while staff have recognized that the introduction of health IT is making concrete, positive contributions to promote patient safety, they have also recognized that personal interaction with patients can be a vital element in achieving that goal. Furthermore, staff acknowledged that health IT may become more pervasive and that careful consideration is needed regarding how health IT is designed and implemented in terms of their practice of medicine and interaction with patients. The efforts of management around patient safety are correlated with both a deepening appreciation of the importance to safety of good communication and a belief that communication systems have improved and, for at least some staff, are correlated with an improved openness to the reporting and analysis of adverse events. However, staff also reported that because communication is now more reliant on IT, there is the potential for both positive and negative impacts on patient safety. One of the key promises made by the eMAR vendor was that the software would alert a nurse about a potential error before s/he actually administered the wrong drug. In practice, the software issued so many warnings that the nurses adapted by ignoring many of them. This set up a risky situation that no one had anticipated.

While the focus of the work was on implementation of EHR components at the hospital, the need to link the hospital to other entities significantly slowed progress. SVMC encountered potential technology links with state EHR initiatives, private practice EHR systems, and the EHR systems of entities within the SVHC organizational umbrella, all of which slowed the ability of SHMC to move forward with new technology.

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### **Selected Outputs**

Lanoue E, Still CJ. Special Report: closing the medication loop. *Health Data Management Magazine* 2008 Dec;16(12):34.

Lanoue E, Still CJ. Patient identification: producing a better bar coded wristband. *Patient Safety and Quality Health Care Magazine* 2008;5(3):12.

Still, CJ. Using video to enhance training. *Meditech Magazine* September 2007.

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**Grantee’s Most Recent Self-Reported Quarterly Status:** This grant has been completed. Implementation of EHRs is continuing at the private practice level. Health IT at SVMC is being positioned for sustainability and for continuation of the culture of patient safety. All project aims have been completed subject to the scope developed during the first year of the grant.

**Milestones:** Progress is mostly on track.

**Budget:** On target.