

Project Title:	Health Information Technology Support for Safe Nursing Care
Principal Investigator:	Keenan, Gail M., Ph.D., R.N.
Organization:	University of Michigan at Ann Arbor
Mechanism:	RFA: HS04-012: Demonstrating the Value of Health Information Technology (THQIT)
Grant Number:	R01 HS 015054
Project Period:	09/04 – 08/08, Including No-Cost Extension
AHRQ Funding Amount:	\$1,486,634
Summary Status as of:	August 2008, Conclusion of Grant

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.

Business Goal: Knowledge Creation

Summary: In today’s health systems, a patient’s care can involve a large number of clinicians, due to both specialization and shift rotations, whose actions are interdependent. In health care organizations, the term “collective mind” refers to this concept. Ideally, members of a patient’s interdependent team, which may include numerous clinicians caring for patients in a hospital setting, will function as a team using a collective mind with respect to having a shared understanding of the patient’s care. The focus of this completed study was on enabling the collective mind, since it is a vital precursor to continuity, safety, and quality of care. Without a collective mind, the patient’s care team is not operating with reliable and valid information necessary to make optimal decisions about care.

The “HANDS” Plan of Care (POC) Method was previously developed and refined through 8 years of research that included a real-time pilot on one intensive care unit (ICU). The HANDS POC Method consists of an electronic application (standardized database and user interface), rules for data entry to create and update POCs in the electronic application (what, how, when), and a standardized handoff procedure. The user interface, database, and rules for use were carefully refined over the years through iterative research. The HANDS design reduces cognitive load by providing an external memory aid that facilitates quick understanding of large amounts of information. As part of HANDS, the nurse is taught and expected to mindfully create and update a patient’s plan and “heedfully interrelate” about it at every handoff.

The main research question for this study was: “Does the previously piloted HANDS intervention successfully represent the “collective mind” of a patient’s team in diverse settings across time?” This concept could not be captured by any single measure or even a single type of analysis; therefore, a variety of cross-sectional and repeated measures, both quantitative and qualitative, were used to assess goals of the system, including mindfulness; heedful interrelating; and a culture of safety, trust, and error reduction. The sample selected for this study consisted of eight diverse acute care units located in four organizations. Units were chosen to represent a wide range of: patient types, including medical-surgical, neurology, neurosurgery, thoracic surgery, progressive care, older adult/stroke, cardiac, and acute care elderly; organization types; geographic locations; unit physical setups, including large, small, ICU, step-down, and regular; cultures; nurse characteristics; and staffing patterns.

Specific Aims

- Support nurse mindfulness in planning care. **(Achieved)**
- Assist nurses during handoffs by emphasizing continuity of care. **(Achieved)**
- Develop electronic documentation to accurately and consistently reflect the plan of care. **(Achieved)**

2008 Activities: Analyses of some data were still ongoing at the end of 2008, with dissemination efforts to follow.

Impact and Findings: Several components of the study used pre- and post-implementation comparisons, including workflow observation and a survey of the culture of safety, while other analytic tools were deployed after go-live, including error reporting and interviews. The project was able to implement and sustain the HANDS POC Method in all of the targeted clinical units for the duration of the study. Registered nurses (RNs) indicated that HANDS was significantly more useful than previous POC methods and were also significantly more familiar and satisfied with the standardized terminologies used within HANDS. Compliance rates for POC submission to the electronic application were extraordinarily impressive and ranged from 78 to 91 percent among the 8 study units, providing evidence of ongoing mindfulness. Additionally, patterns of changes made to the plans by the RNs also provided evidence of the sustained mindfulness in the process. However, compliance in the handoff protocol was less robust, suggesting that there remains more progress to be made. Although observations of handoff instructions demonstrated a body of common knowledge and terminology, many of the features of the software system were underutilized.

This study demonstrated that when the POC is not used as a major driver of team communication, it can become a secondary source that is not kept fully current and is thus a less-useful archive. In contrast, primary sources are kept fully current, reliable, and valid because they are seen as essential to care decisions. Developing the POC, and in particular the HANDS method, into a primary source of information is expected to improve its content and thus improve patient safety. The RNs in this study were fully supportive of using the related handoff protocol, but they indicated a need for better training and support to fulfill its potential. In conclusion, this study has helped make progress toward understanding what is needed to create a valid and reliable representation of the team's collective mind, improving the culture of patient safety.

Selected Outputs

Anderson C, Keenan G, Jones J. Using bibliometrics to support your selection of a nursing terminology set. *Computers Informatics Nursing* 2009 Mar;27(2):82-90.

Keenan G, Tschannen D, Wesley M. Standardized nursing terminologies can transform practice. *J Nurs Adm* 2008 Mar;38(3):103-6.

Westra B, Delaney C, Konicek D, Keenan G. Nursing standards to support the electronic health record. *Nurs Outlook* 2008;56(5):258-66.

Keenan G, Yakel E, Tschannen D, et al. In: Hughes R, editor. *Patient safety and quality: An evidence based handbook for nurses*. Rockville, MD: Agency for Healthcare Research and Quality, 2008. Chapter 49, Documentation and the nurse care planning process.

Keenan G, Yakel E, Marriott D. HANDS: A revitalized technology supported care planning method to improve nursing handoffs. *Stud Health Technol Inform* 2006;122:580-4.

Grantee's Most Recent Self-Reported Quarterly Status: The grant term has ended with all major aims achieved.

Milestones: Progress is mostly on track.

Budget: On target.