

<b>Project Title:</b>	Implementing and Improving the Integration of Decision Support into Outpatient Clinical Workflow
<b>Principal Investigator:</b>	Doebbeling, Bradley, M.D., M.S.
<b>Organization:</b>	Indiana University
<b>Contract Number:</b>	290-06-0013-3
<b>Project Period:</b>	09/07 - 09/09
<b>AHRQ Funding Amount:</b>	\$394,622
<b>Summary Status as of:</b>	December 2008

---

**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:** Implementation and Use

**Summary:** This project encompasses a field study and controlled simulation analysis to integrate colorectal cancer screening clinical decision support (CDS) into outpatient clinical workflow. The study includes key informant interviews on site-specific best practices; direct observation of colorectal cancer screening CDS to identify barriers and facilitators to workflow integration; rapid prototyping of design alternatives based on those findings; controlled simulation to test the impact of design on efficiency, usability, and workload; and implementation of the refined CDS in local clinics to assess usability and impact. The implementation plan involves institutions that have demonstrated improved quality and efficiency using CDS: the Regenstrief Institute, the Department of Veterans Affairs (VA), and Partners Healthcare System.

**Key measures:** The first phase of the project, including the site visits, employs qualitative methods to understand factors related to effective integration of CDS into clinical workflow. Since this phase is qualitative in nature, there are not specific measures associated with the first study phase. The team intends to use rich qualitative observational data to understand key barriers to CDS workflow integration in the use of different electronic medical records (EMRs). Measurable “attributes” associated in the second project phase include efficiency, usability, and workload to demonstrate improved clinical workflow integration in both a simulated setting and actual implementation into clinical practice.

### Specific Aims

- Identify key approaches to CDS development for colorectal cancer screening at two Veterans Affairs Medical Center (VAMC) sites and two nationally recognized non-VA sites, for effective CDS integration into clinical workflow. **(Ongoing)**
  - Hypothesis 1: Effective colorectal cancer screening CDS integration into workflow requires system redesign, human factors assessment, pilot testing, use at the bedside or patient room, and provider training and support.
- Develop and test CDS design alternatives for improved integration into clinical workflow through a controlled simulation study and subsequent implementation. **(Ongoing)**
  - Hypothesis 2: Providers will experience improved efficiency and usability, and decreased workload when using design alternatives for colorectal cancer screening CDS compared to current CDS.

**2008 Activities:** In 2008, the project team finished its visits to all four nationally recognized sites. As coding and collating phase one observation data began, including direct observation of provider interaction with clinical reminders, key informant interviews, and focus groups of providers, it was

recognized that there was a greater volume and richness in the data than had been anticipated. The project was and continues to be pleasantly surprised by the findings that could be drawn from observations and discussions during the four site visits.

**Preliminary Impact and Findings:** As the project collated data and developed common themes, it was discovered that, despite the differences among the sites visited, they had several issues and barriers in common. A rough list of common themes discovered from our data follows:

- **Coordination of outside results** (which includes):
  - Reducing reliance on patient memory
  - Holes in colorectal cancer screening (CRCS) clinical reminders (CR) that are not satisfied or resolved
  - Outside exam results that are received in paper form do not get into electronic form
  - Documenting and tracking outside colonoscopy results in the computerized CDS
- **Data organization and presentation** (which includes):
  - No way to see if a colonoscopy has been ordered or scheduled
  - Prioritization of issues
  - Frustration that the provider can enter information into a GI consult, but then an error message is returned stating that the provider must enter the same information into the CRCS CR
  - No way to determine where the patient is in the CRCS process
- **Provider and patient education** (which includes):
  - Providers not knowing what the CR is for and how to satisfy it
  - Providers are not aware of the current best practices and guidelines for CRCS
  - Poor understanding of fecal occult blood test (FOBT) process
  - Inability to print educational information and literature for the patient from the exam room
  - Patient reluctance toward colonoscopy
  - Inability to print a reminder for the patient to complete followup
- **Navigation**
  - Need better navigation
  - Hard to navigate interface
  - Rigid and inflexible interface
  - Need to add navigation tools
- **Technological enhancements**
  - Inability to draw a lesion
  - Cleaning up inapplicable and/or inaccurate CR for CRCS
- **Form of decision support and connecting it to quality reporting**
- **Workflow/role assignments**
  - Unclear as to who captures necessary information for screening
- **Organizational issues**
  - Configuration of the exam room and placement of the computer
  - Not always an available computer for provider to use
  - Not enough time to satisfy reminders
- **Coordination between gastrointestinal (GI) and primary care**
  - Resolving CR—primary care providers have to locate the results and satisfy the reminder
  - Coordination between GI and primary care

Looking forward, we are exploring facets of redesign that could eliminate or reduce the barriers and facilitate a more seamless interaction among provider, clinical reminders, and patients.

---

### **Selected Outputs**

As of 2008, manuscripts had been drafted but none had yet been published. We anticipate submitting up to four publications to AMIA in 2009.