

## Evaluating Smart Forms and Quality Dashboards in an Electronic Health Record

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<b>Mechanism:</b>	RFA: HS04-012: Demonstrating the Value of Health Information Technology (THQIT)
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**Target Population:** Acute Respiratory Infections, Adults, Chronic Care\*, Diabetes, Heart Disease

**Summary:** This project evaluated the potential for improving the management of patients with acute and chronic medical conditions through the creation of clinical decision support (CDS) tools integrated with clinical documentation workflow, and the provision of physician performance feedback on guideline compliance and quality benchmarks in an electronic health record (EHR). The project sought to increase patient safety and quality and address the combined needs of clinical workflow support and decision support with innovative EHR technology.

The project examined two EHR-based interventions to determine if their use in chronic and acute conditions significantly improves patient clinical outcomes. The first intervention focused on the impact of a forms-based, clinical documentation approach to decision support, called Smart Forms (SFs). SFs incorporate on-screen patient chart reviews, effective coded data capture, note generation, and actionable CDS at the point-of-care to help physicians manage chronic and acute disease, including coronary artery disease (CAD), diabetes mellitus (DM), and acute respiratory infection (ARI). Patient education materials on self-management skills can also be generated from the same screen. The second EHR-based intervention, Quality Dashboards (QDs), provide clinician-specific performance reports on guideline compliance and quality benchmark achievement. QDs help physicians, medical directors, and practice leaders by reporting adherence to recommended clinical guidelines. The QD graphical displays allow for same-practice physician comparison and local and national benchmark comparison. The SF and QD are both integrated with the Longitudinal Medical Record (LMR), the EHR system that was developed by Partners HealthCare System (PHS).

The two interventions were implemented in more than 20 primary care practices in the PHS and more than 400 clinician study participants. To evaluate the SF and QD technology the following randomized, controlled trials (RCTs) were conducted:

- Acute Respiratory Infection Smart Form Randomized Controlled Trial (ARI SF RCT)
- Coronary Artery Disease/Diabetes Mellitus Smart Form Randomized Controlled Trial (CAD/DM SF RCT)
- Acute Respiratory Infection Quality Dashboard Randomized Controlled Trial (ARI QD RCT)
- Coronary Artery Disease Quality Dashboard Randomized Controlled Trial (CAD QD RCT)

In each RCT, PHS-affiliated primary care practices were randomized to follow established protocol, the SF-enhanced protocol, or the SF plus QD enhanced protocol. Data collected from the RCTs and physician surveys were used to answer the following questions: 1) Can a usable EHR-based intervention that provides CDS in the context of clinical documentation workflow and that integrates population-based performance feedback to the physician be developed?; and 2) Do these interventions improve the quality of clinical documentation, capture of key clinical data for CDS and quality assessment, and compliance with best practice guidelines?

### Specific Aims:

- Design and implement an integrated documentation-based CDS and physician feedback system provided in an EHR to improve the management of patients with acute and chronic medical conditions. **(Achieved)**
- Determine the effectiveness of a documentation-based CDS tool and physician feedback with respect to documentation and the clinical management of patients with CAD and ARI. **(Achieved)**
- Assess the perceived value of QDs by clinicians and if they impact SFs' compliance with best practices in ARI and CAD. **(Achieved)**

**2009 Activities:** Analysis of surveys related to the CAD/DM SF RCT was completed in 2009, while data analysis of the ARI QD RCT was ongoing in 2010. The CAD QD RCT was completed in March 2009 and encompassed 15 primary care practices involving approximately 350 clinicians.

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**Grantee's Most Recent Self-Reported Quarterly Status (as of September 2009):** The ARI and CAD QD RCTs were completed in 2009. Data analysis was ongoing in 2010.

**Impact and Findings:** A documentation-based CDS tool and a physician feedback system can be designed and implemented in an outpatient clinical setting. Reported use and evaluation of usability suggest that including such a CDS tool into clinical practice facilitates common tasks such as documentation and order-entry.

The results of the ARI study demonstrated that use of SFs decrease instances of antibiotic prescribing for non-antibiotic-appropriate diagnoses, suggesting better adherence to clinical guidelines on the part of the clinician. The results of the CAD/DM study suggest that using SFs as a CDS tool provide for more up-to-date documentation of clinical data, particularly of patients with chronic conditions. Although the QD studies are pending further analysis, the preliminary results indicate the potential for an EHR-based QD system to provide additional benefit beyond a CDS tool like SF in the management of patients with CAD/DM and ARI.

Although the data analysis is ongoing, a trend has emerged from the study results up to this point. Overall, use of SFs and QDs as a part of clinical decision support correlates with better adherence to the clinical guidelines within the areas described. Also, most users found these tools intuitive to use, easy to integrate into clinicians' workflow, and beneficial in terms of quality of patient care.

**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:** Knowledge Creation

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\* AHRQ Priority Population