

Clinical Decision Support Consortium

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Organization:	Brigham and Women's Hospital
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Target Population: Coronary Artery Disease, Diabetes, Hypertension

Summary: Despite overwhelming evidence of clinical decision support's (CDS's) effectiveness, only a small number of academic medical centers and integrated delivery networks account for the bulk of CDS research and development. Wider CDS adoption has been limited by a variety of social, economic, and technical issues, including: a lack of widely adopted standards for representing and sharing clinical knowledge in a computable form; difficulty developing clinical practice guidelines that can be readily and unambiguously translated into a computable form; absence of a central repository or knowledge resource where computable guidelines can be stored and shared; challenges integrating CDS into the clinical workflow; and limited understanding of organizational and social issues relating to CDS.

As evidenced by sites where CDS is pervasive, these barriers are surmountable. The biggest challenge to fostering widespread CDS adoption is documenting, generalizing, and translating the experience from these advanced sites to broader community settings. To address this challenge, investigators from Brigham and Women's Hospital, Harvard Medical School, and Partners HealthCare Systems (PHS) formed the Clinical Decision Support (CDS) Consortium in collaboration with the Regenstrief Institute, the Veterans Health Administration, Kaiser Permanente Northwest Research Group, General Electric Healthcare, Siemens Medical Solutions, Mayo Clinic, NextGen, University of Texas School of Biomedical Informatics, Oregon Health and Science University, Mid-Valley Independent Physicians Association, and University of Medicine and Dentistry of New Jersey.

The goal of the CDS Consortium is to assess, define, demonstrate, and evaluate best practices for knowledge management (KM) and CDS in health information technology (IT) across multiple ambulatory care settings and electronic health record (EHR) technology platforms in pursuit of widespread CDS adoption. The CDS Consortium is developing a series of service-oriented CDS interventions focused on diabetes, coronary artery disease, and hypertension screening. In the first two years of the project, the team developed the service-oriented CDS interventions and piloted them in four ambulatory sites in Massachusetts. In the next few years, the team will expand the interventions and continue to gather data and develop best practices.

Project Objectives:

- Assess and define best practices for knowledge management and CDS in ambulatory care. **(Ongoing)**
- Define a novel, practical knowledge representation scheme that allows users to access knowledge in a manner that facilitates the translation of knowledge into CDS within EHRs. **(Ongoing)**
- Build a prototype national knowledge repository to support access and use of knowledge artifacts and collaborative knowledge engineering. **(Achieved)**

- Build publicly-available Web services to provide remote CDS. **(Achieved)**
- Build end-user CDS dashboards depicting user compliance with CDS and provide feedback to knowledge engineers building the CDS knowledge artifacts and Web services on the efficacy of the CDS. **(Achieved)**
- Coordinate overall CDSC evaluation activities. **(Ongoing)**
- Demonstrate the feasibility of a service oriented architecture-based approach through multisite, multivendor demonstration projects. **(Ongoing)**
- Disseminate results through a variety of traditional channels. **(Ongoing)**

2010 Activities: The CDS Consortium team continued to pursue research and development through the following project teams from institutions across the U.S: the Knowledge Management Lifecycle Assessment Team (KMLA); the Knowledge Translation and Specification (KTS) Team; the Knowledge Management (KM) Portal Team; the Recommendations Team; the Service Team; the Demonstration Team; the Dashboard Team; the Evaluation Team; and the Content Governancy Committee team. Each team made extensive progress on their goals completing a series of deliverables, including the completion of the beta version of the KTS stand-alone browser-based knowledge authoring tool; the go-live of the eRoom and KM portal; the development of the KM portal user assessment tool; the finalization of recommendations for Healthcare Information Technology Standards Panel, Certification Commission for Health Information Technology, and clinical content developers; the start of a trial of the CDS service in the production environment; the release of the enterprise clinical rules service to production; finalized data specifications for the project evaluation; a “lessons learned” document from the implementation in PHS’s Longitudinal Medical Record; and the go-live of the two PHS CDS dashboards.

Dissemination activities in 2010 included a presentation of results at a technical expert panel meeting in Washington, DC, and at the Guidelines International Network meeting in Chicago, IL. A paper on themes in CDS was submitted to the Journal of the American Medical Informatics Association (JAMIA); the KTS team also submitted their work on the multi-layered knowledge representation framework and evaluation study to JAMIA. Additionally, a paper describing KMLA’s rapid assessment process was submitted to Methods of Information in Medicine.

Preliminary Impact and Findings: Lessons learned from the teams and projects are outlined below.

KM Team: The team discovered that each external CDSC member must do a significant amount of preparation work before integrating the CDSC content. It is critical that KM be included in the discussions with the CDSC members from the beginning. In addition, the Centers for Medicare and Medicaid Service’s meaningful use standards are causing many delays as PHS rapidly transitions from existing systems to new systems that are certified for meaningful use.

KTS Team: The team’s assumptions about building a Web-based editing tool were invalidated by legal concerns. This suggests that a wider review of requirements and specifications is necessary early in the development process.

KMLA Team: The team found that the modified rapid assessment process works for clinical knowledge vendors. Clinical knowledge vendors are, in terms of informatics skills and knowledge, better prepared than anticipated.

Demonstration Team: The team found that despite similar standards and terms, differences in how

terms are mapped and used persist, making the process of mapping burdensome. Integration of CDS into the workflow has to be customized by site due to the differences in the interfaces. Communication across health IT project silos is necessary to ensure that interdependencies are managed and all projects are successful.

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