



HEALTH

CHILDREN AND FAMILIES
EDUCATION AND THE ARTS
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INFRASTRUCTURE AND
TRANSPORTATION
INTERNATIONAL AFFAIRS
LAW AND BUSINESS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
TERRORISM AND
HOMELAND SECURITY

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis.

This electronic document was made available from www.rand.org as a public service of the RAND Corporation.

Skip all front matter: [Jump to Page 1](#) ▼

Support RAND

[Browse Reports & Bookstore](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore [RAND Health](#)

View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND electronic documents to a non-RAND website is prohibited. RAND electronic documents are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

This product is part of the RAND Corporation technical report series. Reports may include research findings on a specific topic that is limited in scope; present discussions of the methodology employed in research; provide literature reviews, survey instruments, modeling exercises, guidelines for practitioners and research professionals, and supporting documentation; or deliver preliminary findings. All RAND reports undergo rigorous peer review to ensure that they meet high standards for research quality and objectivity.

TECHNICAL REPORT

A Prototype Knowledge- Sharing Service for Clinical Decision Support Artifacts

Janet M. Lewis, Tonya M. Hongsermeier,
Blackford Middleton, Douglas S. Bell

Sponsored by the U.S. Department of Health and Human Services

The research described in this report was sponsored by the Office of the National Coordinator for Health Information Technology (ONC) of the U.S. Department of Health and Human Services. The work was conducted under the direction of RAND Health, a division of the RAND Corporation.

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

© Copyright 2012 RAND Corporation

Permission is given to duplicate this document for personal use only, as long as it is unaltered and complete. Copies may not be duplicated for commercial purposes. Unauthorized posting of RAND documents to a non-RAND website is prohibited. RAND documents are protected under copyright law. For information on reprint and linking permissions, please visit the RAND permissions page (<http://www.rand.org/publications/permissions.html>).

Published 2012 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665
RAND URL: <http://www.rand.org>
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

Summary

Objectives

The Office of the National Coordinator for Health Information Technology (ONC) Advancing Clinical Decision Support (ACDS) effort is a project intended to accelerate the effective use of computer-based clinical decision support (CDS) interventions to facilitate evidence-based clinical practice and the meaningful use of health information technology (IT). In Task 4 of this effort, a team of CDS and knowledge management experts led by Tonya Hongsermeier, M.D., of Partners HealthCare has proposed a functional architecture, governance model, and standard format for a knowledge-sharing service (KSS) that could potentially be deployed on a national scale. In addition, the team has built a first-generation version of a KSS that expands on the infrastructure previously developed for the Clinical Decision Support Consortium (CDSC). This report primarily describes the work associated with Task 4.8, led by Janet Lewis. The key objectives were to develop CDS artifacts for at least 20 interventions of different types, targeted toward guidelines and clinical conditions called for in the 2011 meaningful use criteria, and to disseminate the tools, content, and materials through the KSS. This report also describes key findings from the other Task 4 subtasks.

Methods

The ACDS team collaborated with other federally funded efforts, including the CDSC project, the National Quality Forum (NQF) eMeasures effort, and the Structuring Care Recommendations for Clinical Decision Support (eRecs) project. The ACDS interventions or artifacts were built utilizing the extensible markup language (XML) schema developed by the CDSC project and were published on the CDSC portal, which functions as the ACDS KSS. The CDSC portal resides on a Partners HealthCare server and utilizes Documentum's Web Publisher for content life-cycle management, workflow management, metadata tagging, and publishing. The artifact content was based on CDS interventions implemented at Partners and refined based on related CDS projects, especially the NQF eMeasures and eRecs projects. Clinical subject matter experts were consulted to review and finalize the ACDS artifacts. We reviewed our approach with vendors and worked with Allscripts to conduct a demonstration of artifact transformation.

Results

While the original CDSC Level 3 XML schema adequately supported the development of the ACDS alert/reminder artifacts, we worked with the CDSC team to expand the schema to support additional intervention types (order sets, documentation templates, infobuttons, relevant data display, and value sets). Twenty-two CDS artifacts and 16 value sets were developed that cover the five CDS intervention types. Three custom style sheets were developed to render the XML files in human-readable form. We worked with the CDSC portal team to enhance the portal to support the ACDS artifacts and custom style sheets. We also established a new page on the portal to link to the related work performed by the NQF and eRecs project teams. The ACDS artifacts may be viewed at <http://cdsportal.partners.org/>.

Conclusion

The ACDS Task 4 work was instrumental in identifying requirements for a KSS and exercising an XML schema for CDS sharing. Chapter Five highlights the lessons learned, key barriers to knowledge-sharing, recommendations for the future, and reasons for knowledge-sharing. The foundational building blocks for shareable CDS described in Chapter Five, such as dictionaries and value sets, are essential regardless of whether CDS developers and implementers utilize a CDS intervention-sharing or services consumption approach. The CDS content on the portal needs to be expanded and maintained in order for it to remain a viable resource for CDS implementers.