

Clinical Decision Support Consortium: Overview of the Knowledge Management Portal and Repository

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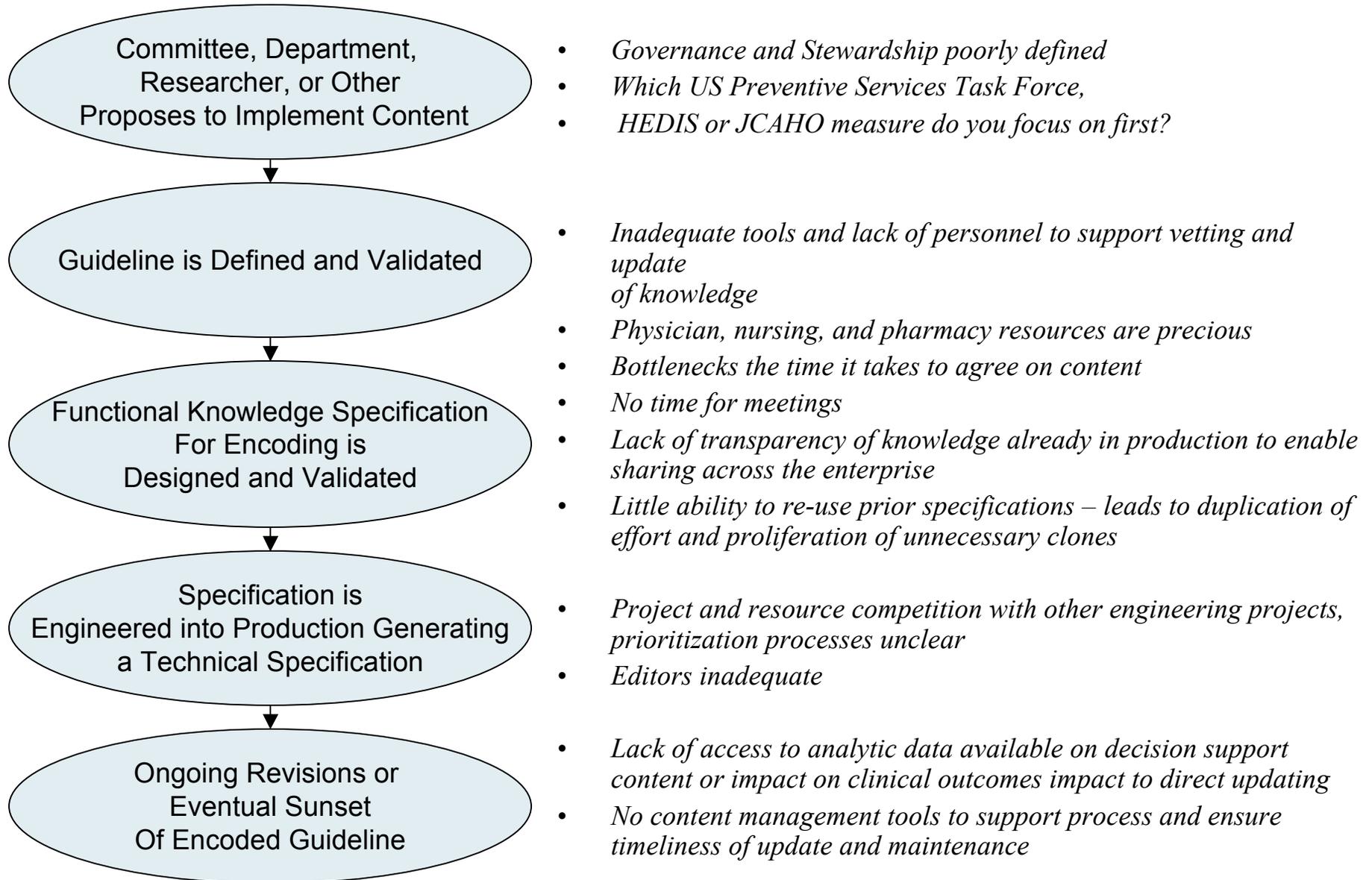


Knowledge Management Portal and Repository Team

- The KMPR Team is developing and implementing collaborative knowledge management tools
- Collaboration tool infrastructure leverages Partners-hosted EMC tool called eRoom
- Repository infrastructure consists of Documentum tools for publishing and life-cycle management of content as well as Partners-developed web portal for access, search and retrieval of content
- These tools support development, review, publication, cataloging and archival of knowledge specifications in human and machine readable forms.
- As the CDS Consortium instance of these technologies are work-in-progress, we will illustrate how these tools are used today at Partners Healthcare System and extrapolate how these will be re-designed and deployed for the Consortium



Knowledge Management for Clinical Decision Support Life-Cycle Challenges:



Key Research Questions for the KMPR Team

- How do we **improve** the efficiency and effectiveness of translation of clinical practice guidelines into actionable CDS in healthcare information technology?
- How do we **collate, aggregate, and curate** knowledge content for CDS in a knowledge portal used by members of the CDS Consortium?
- How may we use such a tool to support knowledge management and collaborative knowledge engineering for clinical decision support at scale, across multiple healthcare delivery organizations, and multiple domains of medicine?
- How do we take the learnings garnered through the course of these investigations and broadly **disseminate** them broadly to key stakeholders?



Enabling Technologies To Be Deployed:

- Collaboration tools for facilitate the content design process
 - Documentum's eRoom
- Knowledge publishing and content life-cycle management tools:
 - Documentum's Web Publisher and Content Management Services
- Knowledge Management Portal
 - User-friendly, searchable library of content

Key Roles in Content Lifecycle

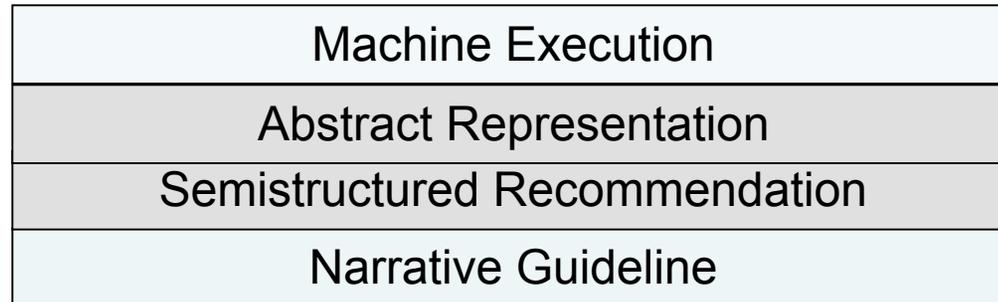
- Clinical Content Committee Members:
 - provide direction/guidance on focus and prioritization of knowledge engineering activities
- Subject Matter Experts (SMEs):
 - physicians, nurses, pharmacists, allied health professionals who participate in vetting and validation of guidelines
- Knowledge Analysts:
 - typically have a clinical background, are stewards of a given knowledge asset, drive the design of knowledge specifications, surface questions to SMEs, manage the life-cycle, publishes to knowledge management portal
- Knowledge Engineers:
 - Ensure the content spec is “implementable” in the available technological framework, encode the knowledge into systems
- Developers:
 - Develop systems and tools for knowledge engineering

CDS Consortium Knowledge Specification Team is Focusing on the Following Disease Areas

- **Diabetes Mellitus**
 - 2007 Diabetes Management Standards of Care from the Clinical Practice Recommendations of the American Diabetes Association.
- **Coronary Artery Disease**
 - American College of Cardiology's guideline on Antiplatelet Therapy Prescribed for Patients with Coronary Artery Disease
 - U.S. Preventive Services Task Force recommendation on Aspirin for the Primary Prevention of Cardiovascular Events
- **Hypertension**
 - U.S. Preventive Services Task Force recommendations on Screening for High Blood Pressure

Multilayered model – Knowledge Stack

Precision and executability



Flexibility and adaptability

Narrative Recommendation layer

Semi-Structured Recommendation layer

Abstract Representation layer

Machine Executable layer

- Knowledge encoded in a format that can be rapidly integrated
- into a CDS tool on a specific HIT platform
- E.g., rule could be encoded in Arden Syntax

A recommendation could have several different artifacts created in this layer, one for each of the different HIT platforms

Partners Healthcare System Deployment of KM Infrastructure

- Began in 2004
- KM Portal currently hosts about 600 specification documents representing 10s of 1000s of rows of content
- The portal supports transparency and sharing of content across a system with 5 internally developed CPOE systems (different architectures), 3 flavors of Meditech, and a Siemens Invision implementation
- 69 eRoom Collaboration Spaces now in production serving 400 and growing active users participating in content life-cycle management
- These collaboration spaces serve knowledge management activities at the enterprise and site-specific level and are organized by various topic areas



Collaboration Tools Enable Virtual, Asynchronous CDS Content Design

search the site | my member info | organize

eRooms | Dashboards

Active eRooms

- ▶ Clinical Content Committee eRoom
- ▶ HPM-Patient Safety Community Hospital Best Practices Sharing
- ▶ HPM Patient Safety - Safety Reporting
- ▶ HPM Trend Management - High Cost Drug Trend Management
- ▶ PCHI - Medical Management Committee
- ▶ PCHI P&T
- ▶ Med Services Gerios
- ▶ Med Services MKC
- ▶ Med Services Pedios
- ▶ HLI - Terminology Management and Content Review
- ▶ ILOG Primitives Rule Authoring Analysis
- ▶ LMR - Adult Primary Care Expert Panel
- ▶ LMR CD and Template Management Portal
- ▶ LMR Pediatric Primary Care Expert Panel
- ▶ LMR OB Content Review eRoom
- ▶ LMR - Rheumatology Expert Panel Review
- ▶ KM - LMR Enterprise Content Management eRoom
- ▶ LMR
- ▶ BWH OE Content Review
- ▶ BWH ADE Review
- ▶ NSMC OE Content Review
- ▶ Smart Forms Content Review & Vetting
- ▶ Smart Forms Master Knowledge & Functional Specification
- ▶ Creative Enterprise Medicine Decision Support

- Organization of collaboration spaces by array of topic areas and participants
- Issue tracking and scheduling of maintenance
- Versioning and annotation of documents
- Decision capture and tracking
- Reporting on design process, labor, participation for transparency

Done | Local intr

Start | In... | G... | Di... | C... | M... | E... | Dr... | F... | F... | E... | K... | HI... | M... | [System Icons]

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Print Mail Wordpad Address Book

Address http://kmcolab.partners.org/eRoom/CDS/PrimaryCareContentLMR/0_1b0e8

Google G Go Bookmarks 54 blocked Check AutoLink AutoFill Send to

b.) Perhaps we could automate a reminder to start doing stool cards at the 5-year mark (if experts think this strategy is actually helpful).

Option #2 looks good. (User), M.D., M.P.H., 15 Oct 07 4:25pm

It is more specific, adding an extra inducement for us to get the facts straight with patients.

Nathan, regarding the 10-year interval, this is for patients at moderate-to-high risk and so the recommendation is q 5 years.

Rachel, I know getting information from endoscopy and path reports remains a problem, but does information from the problem list feed these reminders. That is, if I put "colonic adenoma" on the problem list, does that put my patient (at least) into the q 5 year category?

Problem list (Regier, Rachel, 19 Oct 07 11:53am)

Note: This is addressed in the discussion on other conditions. Short answer: This panel's feedback is needed to determine which problems trigger the reminder, and at what risk level. Follow this link to the discussion: http://kmcolab.partners.org/eRoom/CDS/PrimaryCareContentLMR/0_1c17a

Sorry, my mistake (User), E., M.D., 17 Oct 07 9:59pm

Jeff, you are of course correct -- 10 yr interval does not apply to this group.

Ready to close? (Regier, Rachel, 19 Oct 07 11:51am)

It looks like we have general agreement on this one. It seems like there may be a little confusion regarding how long the reminder will turn off if the clinician does not choose coded responses but instead enters test results. Here's the summary:

- Colonoscopy--turns reminder off for 5 yrs
- Sigmoidoscopy--turns reminder off for 5 yrs
- Stool guaiac--turns reminder off for 1 yr

These were based on USPSTF guidelines and the recommendations of the MGH GI Unit.

Here the knowledge engineering lead draws the discussion to a "close" and affirms that the design is consistent with the U.S. Preventive Services Task Force guidelines.

Clinical Decision Support Consortium

Once specifications are validated,
they are published to the knowledge repository

 Knowledge Management Portal

Keyword Search:



[Home](#)

[Browse by Topic](#)

[Filter-based Search](#)



Welcome to the KM portal!

Welcome

Overview

Launching KM Portal

Help

FAQ

Glossary

Release Notes

KM Team



What is Knowledge Management?

The truth is there is no general agreement on the exact definition of Knowledge Management. A general description according to Wikipedia:

“Knowledge Management (‘KM’) comprises a range of practices used by organizations to identify, create, represent, and distribute knowledge for reuse, awareness and learning. It has been an established discipline since 1995 with a body of university courses and both professional and academic journals dedicated to it. Knowledge Management programs are typically tied to organizational objectives and are intended to achieve specific outcomes, such as shared intelligence, improved performance, competitive advantage, or higher levels of innovation.” [Click here for more on Wikipedia...](#)



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Portal enables Keyword and Filter-based Search, metadata filters will be modified to support CDS consortium

The screenshot displays the Knowledge Management Portal interface within a Microsoft Internet Explorer browser window. The browser title is "Knowledge Management Portal: Filter-based Search - Microsoft Internet Explorer provided by Partners HealthCare System". The address bar shows the URL "http://kmportal.partners.org/filterbasedsearch.aspx".

The main content area is titled "Knowledge Management Portal" and features a "Keyword Search" field with a "Search" button. Below this is a navigation menu with "Home", "Browse by Topic", and "Filter-based Search" (the active tab).

The "Filter-based Search" section is divided into three columns:

- Clinical Disciplines:** A list of medical specialties including Anesthesiology/Perioperative Medicine, Behavioral Medicine, Burn Management, Cardiology (Interventional), Cardiology (Medical), Cardiology (Surgical), Emergency Medicine, Endocrinology, Gastroenterology, General Medicine - Primary Care, General Surgery, GI Colorectal Surgery, Hematology and Oncology, Infectious Disease, Nephrology, Neurology, Neurosurgery, Newborn/Neonatology, Obstetrics and Gynecology, and Ophthalmology.
- Filters:** A section with a "CTRL - click to select multiple choices from the filters" instruction. It contains several dropdown menus:
 - Entity:** All Entities, All Entities - PCHI, BWH
 - Venue:** Acute Care, All Venues, Ambulatory Care
 - Patient Age Group:** Adult, All Patient Age Groups, Geriatric
 - Application:** All Applications, BICS Event Monitor, BICS Order Entry
- Content Type:** All Content Types, Drug Information, Expert Dosing
- Patient Safety:** Alerts and Notification, All Patient Safety, Consequent Order/Lab Display
- Disease Management:** ADHD, All Disease Management, Asthma

A "Submit Filter Search" button is located at the bottom right of the filter section.

The footer of the page includes the "PARTNERS" logo and the text "© Copyright 2005, Partners HealthCare System, Inc." The browser's status bar at the bottom shows "Done" and "Local intranet".

Quantitative and Qualitative Measurement Strategy

- Quantitative measures
 - Collaboration: number and growth rate of logins, participants, and postings
 - Repository: number of guidelines posted, institutions represented, portal searches
- Qualitative measures
 - Technology Acceptance Model, a validated instrument for measuring perceived usefulness and ease of use
 - Instrument will be modified for the context of collaborative knowledge engineering