Clinical Decision Support Consortium Knowledge Management Overview

Overview of key steps in creating, maintaining and publishing CDS content

The Clinical Decision Support (CDS) Consortium (CDSC) Knowledge Management (KM) Portal repository stores all created clinical artifacts, such as alerts, reminders, and infobuttons. The KM Portal contains semi-structured, structured and machine-executable content. Access to the KM Portal is gained after e-signing an electronic end-user agreement. See: http://kmportal.partners.org/

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CDS Design Process

- Identify relevant guidelines and determine proper intervention type
- Analyze current knowledge assets and determine gaps
- Create content specification artifacts
- Vet with Subject Matter Expert
- Review Patient Information model for accuracy
- Model necessary subsets and classes
- Design Rule templates or helper methods
- Author executable rules
- Test rules

Specifications

Each rule-set represents between 30 and 50 clinical rules and may include 200+ concepts

Knowledge Management Workflow

Develop Clinical Content (Artifact & Technical) → Reconcile Clinical Content → Utilize Clinical Content in CDS Services / Publish Clinical Content to KM Portal

Maintain and Update Clinical Content

CDS Content Maintenance

- Reference terminology and guideline monitoring
- Analyze impact on existing rules
- Facilitate Subject Matter Expert review
- Refine rules specifications to reflect updated content
- Update value sets, operational & classification rules
- Test and deploy updated rules
- Upload new artifacts to KM Portal

Future Outlook

As the CDSC tools and content library mature, the number of expected features will grow and time-to-market will decrease.

This is due to the following:

- Superior knowledge authoring tool
- Leading subject matter experts
- Experience with process
- Re-use of content library

CDS Consortium Knowledge Management Portal Services

CDSC KM Portal

The CDSC KM Portal is a repository of CDS intervention specifications which are searchable by key-word and a variety of metadata filters. CDSC customers may:

1. Set up a walk through of the portal early in the integration process in order to inspect the CDS interventions content as well as value set content

2. Read and review the actual rules at all levels, including viewing the rules as written in the rules editor

3. Review value set content that is referenced by the rules to assist with content alignment and data definition reconciliation

CDSC eRoom

The CDSC eRoom supports virtual, asynchronous collaborative CDS intervention and value set design. CDSC customers participating in CDS content design or in the content alignment process may collaborate with CDSC team members in these virtual environments.

Recommended Resources

The CDSC recommends that customer resources such as clinical informaticians, technical engineers, and project managers collaborate closely with the CDSC KM services team to achieve successful integration of CDSC cloud-based CDS services.

CDS Consortium Cloud-Based CDS Services Overview

CDSC cloud-based CDS services are provided by the Enterprise Clinical Informatics Infrastructure Services and Knowledge Management teams from Partners HealthCare System. These services provides the infrastructure for ongoing CDSC research trials. Integration with CDSC CDS services can reduce 'time-to-market' deployment and enhancement of key rules-based decision support, with the backing of the CDSC team.
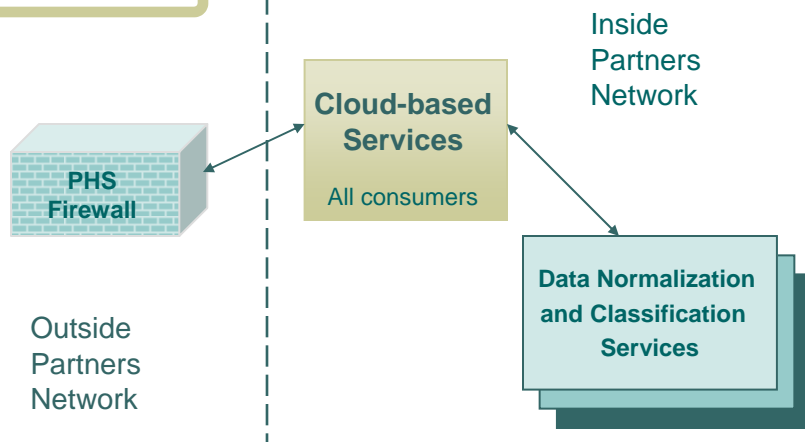
Goals

- Clinicians access a **reliable, proven** source of high-quality, actionable decision support from multiple locations and various electronic health records
- Healthcare knowledge management **outsourced** to world-class decision support service
- Consumers focus on **clinical practice**, rather than technology

Data Requirements

HITSP C32 v 2.5 (C80/C83 v 2.0) compliant Continuity of Care Document (CCD) with the following terminologies:

- Medication Ingredients……….RxNorm
- Medication Classes…………..NDF-RT
- Labs, Vital Signs……..............LOINC
- Problems, Procedures…..……SNOMED, ICD, CPT

Architecture

Inside Partners Network

Cloud-based Services

All consumers

PHS Firewall

Data Normalization and Classification Services

Outside Partners Network

Features

- Remotely hosted, secure web service called by applications to execute decision support rules and guidelines
- Accepts standards-based CCD as data input
- Returns an XML-based "Action Model", allowing end-users complete control over decision support presentation
- Underlying Business Rules Management System supports broad array of clinical decision support tools

CDS Consortium Cloud-Based CDS Services Integration and Related Steps

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User Requirements

1 Demonstrate an ability to create a CCD that is compliant with CDSC requirements:

  a) Complies with HITSP C-32 v 2.5 (C80/C83 v 2.0) standard

  b) Uses terminologies and value sets as specified by the CDSC

  c) If participating in a study, de-identifies header information as specified by the BWH institutional review board (IRB)

User Logistics

2 Obtain digital certificate for access to the CDSC cloud-based CDS services; establish and test the connection.

3 Determine where and how to call the service from within your system and implement.

4 Determine where and how to present returned recommendations; implement your preferred presentation from the XML response returned by the service.

5 Validate and align the meaning of the clinical codes used by your EHR with the codes used by CDSC rules. Content subsets are available on the CDSC KM Portal, as are documents displaying individual CDSC rules.

6 If participating in a study, log timing data at various points during data preparation and service calls, and send to the research database.

Legal Aspects

7 Work with local and CDSC legal teams to sign a data sharing and services sharing agreements.

8 If participating in a study, obtain local institutional review board IRB approval.

Testing

9 Conduct end to end testing together with the CDSC Services team.

10 Begin production use.

* Integration efforts vary based on complexity of service insertion and dictionary reconciliation.

CDS Consortium Cloud-Based CDS Services Rule Content Summary

Clinical Decision Support (CDS) content available in the Enterprise Clinical Rules Service (ECRS)

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11 Clinical Reminders

1. Reminders for patients with <u>Non-gestational Diabetes Mellitus</u>: annual foot and eye exam, semi-annual Hemoglobin A1c test, annual urine micro albumin/creatinine ratio measurement, for patients with Non-gestational Diabetes Mellitus and renal disease, consider starting angiotensin-converting enzyme inhibitor (ACE-I), and for patients with Non-gestational Diabetes Mellitus and renal disease and contraindications to ACE-I present, consider starting angiotensin-2 receptor antagonist (ARB).

2. Reminders for patients with <u>Hypertension</u>: annual blood pressure check.

3. <u>Anti-Platelet Therapy</u> (for patients with ischemic vascular disease, CAD or equivalent): recommend starting anti-platelet therapy and consider starting anti-platelet therapy, but potential contraindications exist.

50+ Classification Rules

"Classification Rules" can be used alone or as part of other rules such as Clinical Reminders and Alerts. These rules include rules that define: Clinical States, Indication States, Contraindication States, Goal States, and Risk States, etc.

375 CDC Immunization Schedule Rules

The ECRS contains rules implementing the February 2012 CDC Immunization Guidelines pertaining to all pediatric and adult vaccine schedules (including catch-up schedules). These rules cover only a limited number of indications and contraindications, specifically those based on: Demographics (age and gender), Problem List, and Procedures.

37 Traumatic Brain Injury Risk Assessment Rules

These rules assess for clinically-important traumatic brain injuries (ciTBI) in children younger than two years and 2-18 years after blunt head trauma to determine whether cranial CT scans for these patients are advisable. The ciTBI prediction rules were previously derived and validated by the Pediatric Emergency Care Applied Research Network and published in the Lancet in 2009.

25 CHA_2DS_2VASc Rules

Calculates a CHA_2DS_2VASc score to determine stroke risk for ambulatory patients with atrial fibrillation and generates a quality metric for treatment guideline adherence for outpatient clinics.

CDS Consortium Cloud-Based CDS Services Examples

The following are examples of CDSC cloud-based CDS services providing decision support within the ambulatory medical records of two members of the CDS Consortium.

Partners HealthCare EHR

Regenstrief Medical Record System®

Reminders

- Patient 65yrs or older, due for Pneumovax

- Patient 50 years old or greater, recommend influenza vaccination

- Pt is overdue for colonoscopy (rec: g 10 years). Famhbc indicates average risk for colorectal cancer

- Diabetic patient is overdue for HgbA1c measurement (recommended every 6 months)

- Diabetic patient with renal disease, consider starting angiotensin-converting enzyme inhibitor (ACE-1).

- Patient has CAD or equivalent, consider starting anti-platelet therapy, but potential contraindictions exist

- Patient is overdue for blood pressure assessment (recommended yearly)

Patient	Subject
AMRADEMO, TESTER	Diabetic patient is overdue for HgbA1c measurement (recommended every 8months)

Sender	USER, CARERULE	Priority	Low
Viewed		Info only:	TRUE
Can Delete	TRUE	Can forward:	TRUE

Diabetic patient is overdue for HgbA1c measurement (recommended every 8months)

Order HgbA1c

DISCLAIMER

Message: This decision support reminder may be inaccurate or incomplete data. The Clinician should always use proper judg seems clinically inappropriate. This decision support is produced by the Clinical Decision Support Consortium Studies Preventive Services Task Force. For any questions please contact _____ (email: _____ @ ...