

December 20, 2018 CDS Connect Work Group Call



CDS Connect

AGENDA

3:00 – 3:05	Roll Call, Ginny Meadows (MITRE)
3:05 – 3:10	Review of the Agenda, Maria Michaels (CDC)
3:10– 3:25	Demonstration of Artifact Discovery, Howard Kong and Noranda Brown (MITRE) <ul style="list-style-type: none"> • Question and answer period
3:25 – 3:40	CDS Connect Artifact Versioning and Comments, Dave Winters (MITRE) <ul style="list-style-type: none"> • Discuss options for versioning of artifacts • Discuss options for allowing comments on artifacts • Question and answer period
3:40 – 3:50	CDS Connect OY2 Prototype Development, Chris Moesel (MITRE) <ul style="list-style-type: none"> • Share information on this year’s prototype development, as well as a brief demonstration
3:50 – 3:55	Update on OY2 Artifact Development and Pilot, Ginny Meadows (MITRE) <ul style="list-style-type: none"> • Share current status of pilot discussions and related CDS development options
3:55 – 4:00	Open Discussion and Close Out, Maria Michaels (CDC) <ul style="list-style-type: none"> • Open discussion and announcements • Concluding comments, review next steps and adjourn

- CDS = Clinical Decision Support
- OY2 = Option Year 2

Demonstration: Artifact Discovery

Artifact Versioning and Comments

Versioning: Current State

- **Artifacts on the CDS Connect Repository have a “Version” field**
 - Semantic Version Number for the artifact (<http://semver.org/>)
 - MAJOR.MINOR.PATCH (e.g., 1.1.3)
- **In addition, attachments can have their own versions**
 - E.g., white papers, logic files, etc.
- **The Repository also keeps track of revisions made to each artifact**
 - Similar to “track changes” capability in most word processors
- **Artifact contributors can view and revert to past revisions of their artifacts**
 - But this is not exposed to the public

Versioning: Future Options

- **Enforce/encourage semantic versioning rules when artifacts are updated**
 - MAJOR version increment when backwards incompatible changes are made
 - MINOR version increment when backwards compatible functionality is added
 - PATCH version increment for backwards compatible bug fixes and editorial revisions
- **The above would cover changes made to attachments, since they are considered “part of the artifact”**
 - E.g., a white paper attachment is updated with editorial changes and revisions, which should result in a PATCH version increment
 - E.g., 1.4.3 → 1.4.4
- **Expose published versions to general public for viewing**
 - With notices as appropriate when they are not viewing the most recent version

Versioning: Discussion

- **How to enforce and/or encourage use of semantic versioning?**
- **What value is added by making past revisions of an artifact visible to the public?**
 - Is a change log sufficient?
 - Along with version number?
- **General thoughts on approach?**

Commenting / Rating Artifacts

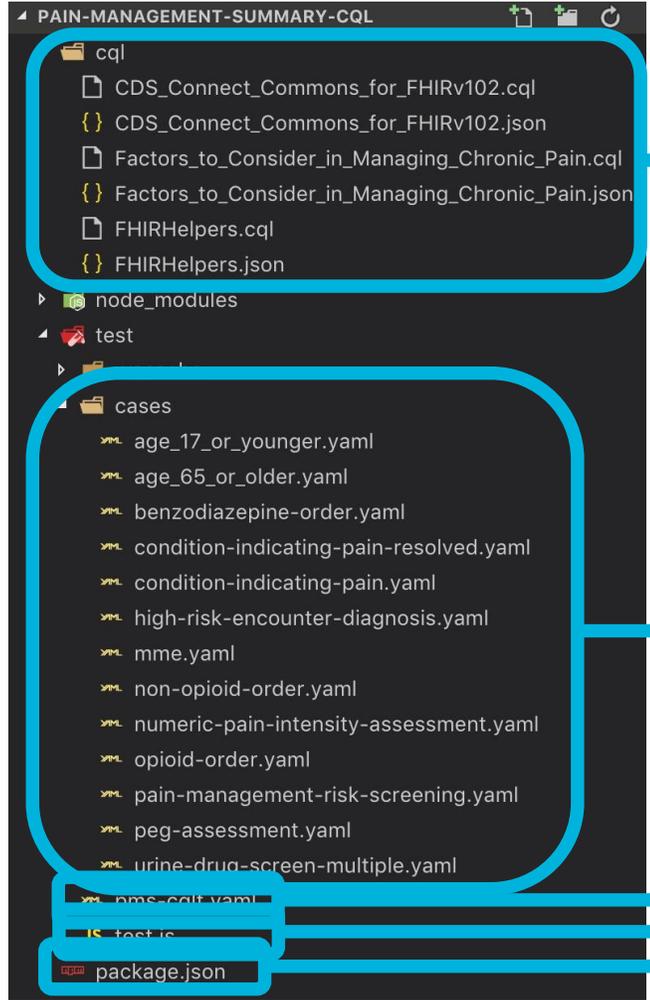
- **Allowing artifact consumers to comment on and/or rate adds value:**
 - Opportunity for Q&A between artifact authors and artifact consumers
 - Artifact consumers can provide feedback from their implementation experiences
 - Visible ratings on artifacts adds trust
- **Biggest questions about adding a commenting/rating capability to artifacts are not technical in nature:**
 - Who can comment and/or rate?
 - Most likely only authenticated users.
 - What is the process for reviewing comments before they are published?
 - What privacy concerns are there if users are allowed to post comments?
 - How should published comments be presented to the public?

OY2 Prototype Development

OY2 Prototype: CQL Testing Framework

- Leverage open source CQL execution engine to execute CQL-based tests
- Easily specify synthetic patient test cases and expected output
- Easily export test cases as FHIR patient bundles (for integration testing)
- Calculate test coverage to ensure all paths in the artifact are tested
- Generate easy-to-read test reports
- Share test cases on CDS Connect to allow users to locally test artifacts

CQL Testing Framework: Project Organization

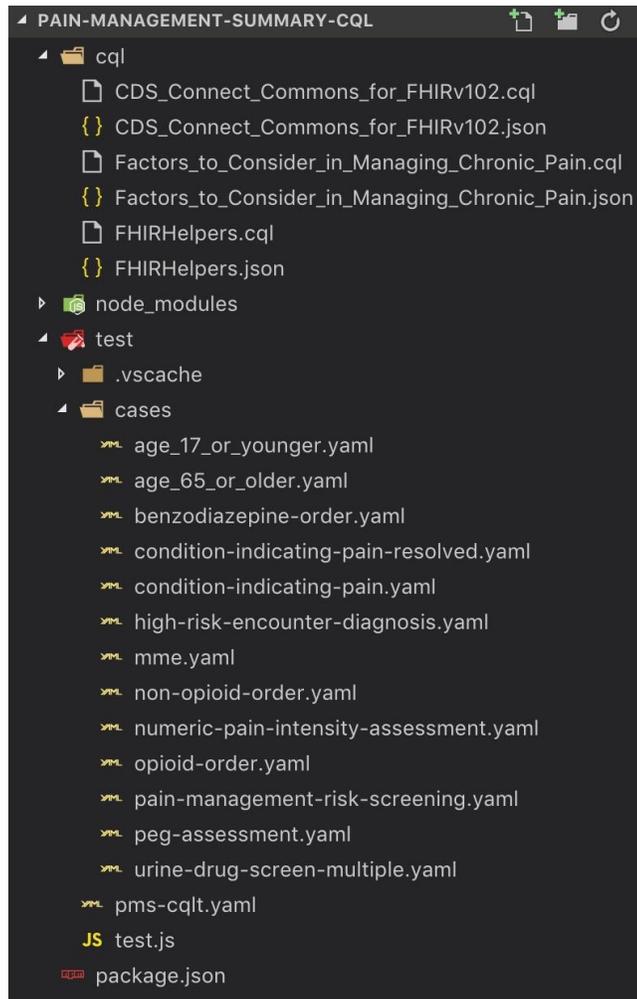


CQL and ELM JSON files

Test Cases (YAML format)

CQL Testing Config File
Simple Mocha Test File (bootstrap)
Node.js Project File

CQL Testing Framework: Configuration



Configuration for project structure on the left:

```

1  ---
2  library:
3    |   name: Factors_to_Consider_in_Managing_Chronic_Pain
4    |   paths: ../cql
5  tests:
6    |   path: cases
7  options:
8    |   date: "2018-12-10T00:00:00.0Z"
9

```

CQL Testing Framework: Full Configuration Format (1 of 2)

■ **library**

- **name**: name of library to load
- **version**: version of library to load
- **paths**: file paths of cql library and dependencies

■ **tests**

- **path**: file path of test case files

CQL Testing Framework: Full Configuration Format (2 of 2)

■ options

- **date**: execution date to use when running CQL
- **vsac**
 - **user**: VSAC user name for downloading value sets
 - **password**: VSAC password for downloading value sets
 - **cache**: file path to cache downloaded value set data
- **dumpFiles**
 - **enabled**: dump FHIR bundles and CQL results to files
 - **path**: path to dump bundles and results to (if enabled)

CQL Testing Framework: Defining Test Cases (Data)

```

peg-assessment.yaml x
1 ---
2 name: Has PEG Assessment
3
4 data:
5 -
6   resourceType: Patient
7   name: Joe Smith
8   gender: male
9   birthDate: 1954-02-16
10 -
11  resourceType: Condition
12  code: SNOMED#203082005 Fibromyalgia (disorder)
13  onsetDateTime: 2012-04-05
14 -
15  resourceType: Observation
16  code: http://cds.ahrq.gov/cdsconnect/pms#PEGASSESSMENT Pain Enjoyment General Activity (PEG) Assessment
17  category: OBS-CAT#survey
18  valueQuantity: 5
19  issued: 2018-12-05
20  component:
21  -
22    code: http://cds.ahrq.gov/cdsconnect/pms#PEGPAIN Pain
23    valueQuantity: 7
24  -
25    code: http://cds.ahrq.gov/cdsconnect/pms#PEGENJOYMENT Enjoyment of life
26    valueQuantity: 5
27  -
28    code: http://cds.ahrq.gov/cdsconnect/pms#PEGGENERALACTIVITY General activity
29    valueQuantity: 4
30

```

Defined in YAML

Currently supports DSTU2:

- Condition
- Encounter
- MedicationOrder
- MedicationStatement
- Observation
- Procedure

More to come...

CQL Testing Framework: Defining Test Cases (Expected Results)

- Deep compares each expression result
- Ignores unlisted top-level expressions
- Supports strings, integers, decimals, booleans, datetimes, lists, intervals...

More to come...

```

peg-assessment.yaml x
31 results:
32   Summary:
33     Patient:
34       Name: Joe Smith
35       Gender: male
36       Age: 64
37       MeetsInclusionCriteria: true
38     PertinentMedicalHistory:
39       ConditionsAssociatedWithChronicPain:
40         -
41           Name: Fibromyalgia (disorder)
42           Status: active
43           Onset: '2012-04-05T00:00:00.000+00:00'
44           DateRecorded: null
45       RiskFactorsForOpioidRelatedHarms: []
46     PainAssessments:
47       NumericPainIntensityAssessments: []
48       PainEnjoymentGeneralActivityAssessments:
49         -
50           Name: 'Pain Enjoyment General Activity (PEG) Assessment [Range: 0-10]'
51           Score: '5'
52           Interpretation: null
53           Questions:
54             -
55               Name: Pain
56               Score: '7'
57             -
58               Name: Enjoyment of life
59               Score: '5'
60             -
61               Name: General activity
62               Score: '4'
63           Date: '2018-12-05T00:00:00.000+00:00'
64       STarTBackAssessments: []
65     HistoricalTreatments:
66       OpioidMedications: []
67       NonOpioidMedications: []
68       NonPharmacologicTreatments: []
69       StoolSoftenersAndLaxatives: []
70     RiskConsiderations:
71       RiskScreeningsRelevantToPainManagement: []
72       BenzodiazepineMedications: []
73       NaloxoneMedications: []
74       UrineDrugScreens: []
75       MostRecentMME: null
  
```

CQL Testing Framework: Reporting Results (Pass)

```
2. bash
pain-management-summary-cql $ npm test

> pain-management-summary-cql@1.0.0 test /Users/cmoesel/dev/cds-connect/pain-management-summary-cql
> mocha --reporter spec --recursive

CQLT Config: /Users/cmoesel/dev/cds-connect/pain-management-summary-cql/test/pms-cqlt.yaml

Factors_to_Consider_in_Managing_Chronic_Pain_v1.0.0
  ✓ Aged 17 years or younger
  ✓ Aged 65 years or older
  ✓ Has Benzodiazepine Order (Diazepam)
  ✓ Has a Resolved Condition Likely to Indicate Chronic Pain (Fibromyalgis)
  ✓ Has Condition Likely to Indicate Chronic Pain (Fibromyalgis)
  ✓ Has High Risk Encounter Diagnoses for Opioid Therapy (Suicide attempt)
  ✓ Has Recent MME Calculation
  ✓ Has Non-Opioid Order (Aspirin)
  ✓ Has Numeric Pain Intensity Assessment (FACES)
  ✓ Has Opioid Order (Oxycodone)
  ✓ Has Pain Management Risk Screening (PHQ-9)
  ✓ Has PEG Assessment
  ✓ Has Multiple Urine Drug Screens (Opiates [Presence])

13 passing (132ms)

pain-management-summary-cql $
```

CQL Testing Framework: Reporting Results (Fail)

```
2. bash
12 passing (138ms)
1 failing

1) Factors_to_Consider_in_Managing_Chronic_Pain_v1.0.0
   Has PEG Assessment:

   Summary=<[object Object]>
   + expected - actual

     "Name": "Pain Enjoyment General Activity (PEG) Assessment [Range: 0-10]"
     "Questions": [
       {
         "Name": "Pain"
         - "Score": "3"
         + "Score": "7"
       }
       {
         "Name": "Enjoyment of life"
         - "Score": "1"
         + "Score": "5"
       }
       {
         "Name": "General activity"
         - "Score": "2"
         + "Score": "4"
       }
     ]
     - "Score": "2"
     + "Score": "5"
   }
 ]
 "StarTBackAssessments": []
 }
```

CQL Testing Framework: Next Steps

- **Create user guide / documentation**
- **Improve usability**
- **Add YAML support for more resource types**
- **Add support for user-supplied FHIR bundles**

OY2 Artifact Development and Pilot Outreach

Potential CDS Options

■ Favored CDS options:

- Create patient/consumer-facing CDS that could be used with either a patient portal, a personal health record, an employer or health plan wellness web site, or an employee health web site
- Convert 1 or more of the newest USPSTF A, B, or D recommendations to a CDS intervention

■ Other CDS options:

- Convert 1 or more eCQM specifications to a CDS intervention
- Create a clinician-facing SMART on FHIR app similar to the ePSS but integrated with an EHR, updating the user interface and removing recently performed screenings from the results
- CDS that addresses a business need (i.e., over-ordering of services)

■ Pilot site CDS recommendations

Current Artifact Work

- Performing initial high-level analysis of the “A” & “B” recommendations to identify existing value sets for concepts such as services performed
- Exploring options for patient-friendly language to represent the USPSTF recommendations
- Reviewing the new or revised “A” & “B” recommendations for feasibility

Pilot Site Outreach

- **To date, the CDS Connect team has connected with over 20 potential pilot organizations.**
- **Discussions have occurred with 14 organizations, with a few pending post holidays**
- **Organizations have diverse settings and focus including:**
 - Traditional clinician-facing “brick and mortar” settings
 - Telehealth companies
 - Patient/consumer-focused organizations working with employers and/or health plans

Next Steps

- **Conduct more detailed technical meetings with organizations who express willingness to pilot**
- **Meet with our sponsor, AHRQ, in early January to share potential pilot site details and discuss optimal pilot organization and related CDS artifact development**
- **Continue analysis of the USPSTF recommendations**
- **Begin formulating potential CDS artifacts based on pilot interest**

Announcements, Open Discussion, and Close-out

Back up slides

Pilot Goals and Objectives

- **Demonstrate the feasibility of implementing the CDS Connect artifact, and capture details of the process to inform other implementations:**
 - Download from the Repository
 - Integration with Health IT
 - Integration testing
 - Clinical implementation and use
 - Clinician interviews and metrics
- **2 primary objectives:**
 - Does the CDS provide clinical value to clinicians and/or patients?
 - Does the CDS development, implementation and dissemination provide value to the organization?

Project Timeline

- Sept-Nov: Environmental Scan
- Nov-Dec: Pilot site engagement
- Jan 2019: Pilot site selection
- Jan-April: CDS development
- March-Aug: Pilot activities
- June-Aug: Live pilot

Focal Areas: USPSTF Recommendations, A, B, 2018, (1 of 2)

Name	Type	Year	Age Group	Details	Grade	Date	Earlier Publications
1 Cervical Cancer: Screening	Screening	2018	Adolescent, Adult, Senior	Women aged 21 to 65 years: The USPSTF recommends screening for cervical cancer every 3 years with cervical cytology alone in women aged 21 to 29 years. For women aged 30 to 65 years, the USPSTF recommends screening every 3 years with cervical cytology alone, every 5 years with high-risk human papillomavirus (hrHPV) testing alone, or every 5 years with hrHPV testing in combination with cytology (cotesting).	A	Aug-18	2003; 2012
-	-	-	-	-	-	-	-
2 Falls Prevention in Community-Dwelling Older Adults: Interventions	Counseling, Preventive medication	2018	Senior	Adults 65 years or older: The USPSTF recommends exercise interventions to prevent falls in community-dwelling adults 65 years or older who are at increased risk for falls.	B	Apr-18	2012
-	-	-	-	-	-	-	-
3 Intimate Partner Violence, Elder Abuse, and Abuse of Vulnerable Adults: Screening	Screening	2018	Adolescent, Adult, Senior	Women of reproductive age: The USPSTF recommends that clinicians screen for intimate partner violence (IPV) in women of reproductive age and provide or refer women who screen positive to ongoing support services	B	Oct-18	2004; 2013
-	-	-	-	-	-	-	-
4 Osteoporosis to Prevent Fractures: Screening	Screening	2018	Adult, Senior	Women 65 years and older: The USPSTF recommends screening for osteoporosis with bone measurement testing to prevent osteoporotic fractures in women 65 years and older.	B	Jun-18	2002; 2011
5				Postmenopausal women younger than 65 years at increased risk of osteoporosis: The USPSTF recommends screening for osteoporosis with bone measurement testing to prevent osteoporotic fractures in postmenopausal women younger than 65 years who are at increased risk of osteoporosis, as determined by a formal clinical risk assessment tool.	B		

Focal Areas: USPSTF Recommendations, A, B, 2018, (2 of 2)

	Name	Type	Year	Age Group	Details	Grade	Date	Earlier Publications
6	Skin Cancer Prevention: Behavioral Counseling	Counseling	2018	Adolescent, Adult, Pediatric, Senior	Young adults, adolescents, children, and parents of young children: The USPSTF recommends counseling young adults, adolescents, children, and parents of young children about minimizing exposure to ultraviolet (UV) radiation for persons aged 6 months to 24 years with fair skin types to reduce their risk of skin cancer.	B	Mar-18	2003; 2012
7	Syphilis Infection in Pregnant Women: Screening	Screening	2018	Adolescent, Adult	Pregnant women: The USPSTF recommends early screening for syphilis infection in all pregnant women.	A	Sep-18	2009
8	Unhealthy Alcohol Use in Adolescents and Adults: Screening and Behavioral Counseling Interventions	Counseling, Screening	2018	Adolescent, Adult, Senior	Adults 18 years or older, including pregnant women: The USPSTF recommends screening for unhealthy alcohol use in primary care settings in adults 18 years or older, including pregnant women, and providing persons engaged in risky or hazardous drinking with brief behavioral counseling interventions to reduce unhealthy alcohol use	B	Nov-18	2004; 2013
9	Weight Loss to Prevent Obesity-Related Morbidity and Mortality in Adults: Behavioral Interventions	Counseling	2018	Adult, Senior	Adults: The USPSTF recommends that clinicians offer or refer adults with a body mass index (BMI) of 30 or higher (calculated as weight in kilograms divided by height in meters squared) to intensive, multicomponent behavioral interventions.	B	Sep-18	2003; 2012

eCQMs (1 of 2)

CMS eCQM ID	Ranking	Measure Title	Clinical Recommendation Statement (Partial)
CMS 349v1	0 (New)	Human Immunodeficiency Virus (HIV) Screening	The USPSTF recommends that clinicians screen for HIV infection in adolescents and adults aged 15 to 65 years. Younger adolescents and older adults who are at increased risk should also be screened (“A” Recommendation) (Moyer, 2013).
CMS 249v1	0 (New)	Appropriate Use of Dual-energy X-ray Absorptiometry (bone density) Scans in Women Under 65 Years Who Do Not Meet the Risk Factor Profile for Osteoporotic Fracture	<p>“The USPSTF recommends screening for osteoporosis in women aged 65 years or older and in younger women whose fracture risk is equal to or greater than that of a 65-year-old white woman who has no additional risk factors. This is a “B” recommendation.”</p> <p>“The USPSTF concludes that for men, evidence of the benefits of screening for osteoporosis is lacking and the balance of benefits and harms cannot be determined.”</p>
CMS 69v7	1	Preventive Care and Screening: Body Mass Index (BMI) Screening and Follow-Up Plan	<p>USPSTF Clinical Guideline (Grade “B” Recommendation)</p> <p>Individuals with a body mass index (BMI) of 30 kg/m² or higher should be offered or referred to intensive, multicomponent behavioral interventions that include the following components</p>
CMS 138v7	3	Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention	The USPSTF recommends that clinicians ask all adults about tobacco use, advise them to stop using tobacco, and provide behavioral interventions and FDA-approved pharmacotherapy for cessation to adults who use tobacco. (Grade “A” Recommendation) (U.S. Preventive Services Task Force, 2015)
CMS 22v7	5	Preventive Care and Screening: Screening for High Blood Pressure and Follow-Up Documented	The USPSTF recommends screening for high blood pressure in adults age 18 years and older. This is a grade A recommendation.
CMS 130v7	7	Colorectal Cancer Screening	The USPSTF (2016) recommends screening for colorectal cancer starting at age 50 years and continuing until age 75 years. This is a Grade “A” recommendation (U.S. Preventive Services Task Force, 2016).
CMS 125v7	9	Breast Cancer Screening	The USPSTF recommends biennial screening mammography for women aged 50-74 years (“B” recommendation).

eCQMs (2 of 2)

CMS eCQM ID	Ranking	Measure Title	Clinical Recommendation Statement (Partial)
CMS 124v7	15	Cervical Cancer Screening	The USPSTF recommends screening for cervical cancer in women aged 21 to 65 years with cytology (Papanicolaou smear) every 3 years or, for women aged 30 to 65 years who want to lengthen the screening interval, screening with a combination of cytology and HPV testing every 5 years. (“A” recommendation)
CMS 2v8	19	Preventive Care and Screening: Screening for Depression and Follow-Up Plan	Adolescent Recommendation (12-18 years): “The USPSTF recommends screening for MDD in adolescents aged 12 to 18 years. Screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up (B recommendation).” (Sui, A. and USPSTF, 2016, p. 360). Adult Recommendation (18 years and older): “The USPSTF recommends screening for depression in the general adult population, including pregnant and postpartum women. Screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up (B recommendation).” (Sui, A. and USPSTF, 2016, p. 380).
CMS 155v7	22	Weight Assessment and Counseling for Nutrition and Physical Activity for Children and Adolescents	USPSTF (2017): The USPSTF recommends that clinicians screen for obesity in children and adolescents 6 years and older and offer or refer them to comprehensive, intensive behavioral interventions to promote improvements in weight status. (“B” recommendation)
CMS 153v7	26	Chlamydia Screening for Women	The USPSTF recommends screening for chlamydia in sexually active females aged 24 years or younger and in older women who are at increased risk for infection. (“B” recommendation)
CMS 82v6	51	Maternal Depression Screening	The USPSTF recommends screening for depression in the general adult population, including pregnant and postpartum women. Screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up. (“B” recommendation)

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