CDS Connect Work Group
Meeting Summary
May 16, 2019
3:00-4:30 PM EST

Attendees

AHRQ Sponsors	Ed Lomotan, Anca Tabakova, Steve Bernstein
Work Group Members	Andrey Soares, Apurva Desai, Bijal Shah, Bob Badgett, Daryl Chertcoff, Dwayne Hoelscher, Edna Boone, Frank Sonnenberg, Jeremy Michel, Linda Wedemeyer, Michael Wittie, Molly McCoy, Noam Artz, Preston Lee, Raajiv Ravi, Randolph Barrows, Ryan Mullins, Sandra Lewis, Steve Hasley
MITRE CDS Connect Project Members	Ginny Meadows, Chris Moesel, Dave Winters, Dylan Mahalingam, Howard Gershen, Julie Afeltra, Lacy Fabian, Sharon Pacchiana, Sharon Sebastian

The MITRE Corporation operates the Centers for Medicare & Medicaid Services (CMS) Alliance to Modernize Healthcare, a federally funded research and development center (FFRDC) dedicated to strengthening the nation's health care system. MITRE operates the Heath FFRDC in partnership with CMS and all divisions of the Department of Health and Human Services (HHS).

Agenda

- Welcome and brief review of meeting objectives and the agenda
- Share information on the Agency for Healthcare Research and Quality (AHRQ) Evidence-Based Care Transformation Support (ACTS) initiative
- Share an update on the clinical decision support (CDS) prototype testing tool
- Demonstrate new parameter type features in the Authoring Tool (AT)
- Share an update on the Option Year (OY) 2 pilot technical approach
- Share information on recent CDS Connect participation at the American Medical Informatics Association (AMIA) Clinical Informatics Conference (CIC)
- Closing

Action Items

- Sent ACTS slides and contact information to the Work Group (WG) members (Done)

Meeting Summary

Welcome

MITRE started the meeting by welcoming participants and reviewing the names of WG members participating in the call. Ginny Meadows then reviewed the agenda and facilitated the rest of the discussion.

Overall:

The meeting opened with a discussion of the AHRQ ACTS initiative. In addition, the meeting included an update and demonstration on the Clinical Quality Language (CQL) Testing Framework prototype tool, and a demonstration of the new parameter type feature in the AT. Information and a discussion on the technical approach for this year's pilot as well as an update on the recent CDS Connect attendance and presentation at the AMIA CIC conference. During each presentation, WG member ideas, suggestions and concerns were encouraged.

AHRQ Evidence-Based Care Transformation Support Initiative (ACTS), Jerry Osheroff (ACTS Project SME)

Jerry Osheroff presented information about the ACTS initiative and potential synergy with CDS Connect and the WG. He provided information on the project objective and goal, as well as how this fits into delivering a future state vision. Information on the makeup and participants for the current ACTS stakeholder community was also provided. Jerry noted that there was significant overlap with members of the CDS Connect WG and the ACTS workgroups. Jerry also provided information on AHRQ's role in delivering a future state, leveraging AHRQ "What Works" offerings. He discussed the future vision for the project including care delivery, resource providers (e.g., guideline developers and vendors), care transformation and the Learning Health System. The concept demonstration has been shared with a number of different organizations to obtain feedback, and their learnings will inform the roadmap moving forward.

The ACTS team is currently forming WGs on several different topics, and Jerry mentioned that this is where synergy with the CDS Connect WG might be realized. He asked the WG members to review the patient journey scenario created by the ACTS team and think about role of CDS Connect for the future state vision.

Jerry invited comments and discussion from the WG members.

a. Ginny Meadows offered to send any documents or information to the WG members, and Jerry agreed that was a good idea. Jerry mentioned that he believes a key opportunity is using the learnings and actions from the CDS Connect project and WG to inform the ACTS initiatives.
b. A WG member mentioned the CDS Connect sustainability efforts that are ongoing. The Healthcare Services Platform Consortium (HSPC) is very interested in establishing a vendor neutral, open, sustainable playing field for healthcare distribution and stewardship of clinical executable content such as CQL libraries. He commented that this requires a tremendous amount of collaboration, especially in creating a network of content providers and stewards to commit resources. He feels the new WG can make material progress in establishing this sort of system, outside of the vendor community.

c. Jerry suggested that perhaps those CDS Connect WG members that are also participating in ACTS can help identify liaisons who can help with the cross fertilization between the ACTS initiative and CDS Connect to facilitate the sharing of ideas.
    i. A WG member agreed that this sounded great. He suggested that perhaps we need a document that shows a map of who is participating and how the efforts overlap
    ii. Jerry mentioned that someone is working on a piece of that, and their intention is to build this out.
d. A WG member asked if there was a need for non-physician clinical input?
    i. Jerry confirmed that yes, there are stakeholders from the full care team participating.

Ginny Meadows will distribute the slides as well as the ACTS WG contact information to CDS Connect WG members.

CDS Prototype Tool Update: Testing and CQL Services, Chris Moesel (MITRE)

Chris Moesel began the discussion by reviewing information about the CQL Testing Framework configuration file, displaying a typical configuration file. Options allow the user to provide configuration information, such as the evaluation date to use for execution. He showed examples of typical test case data formatted using YAML Ain't Markup Language (YAML). The expected results also need to be defined, so the user knows what return information to expect when the CQL is executed. When the test case is run, the returned data shows if the results pass, and if they fail, why they fail. Chris then provided information on the new features and capabilities that have been developed since the earlier Testing Framework presentation to the WG. This included support of Fast Healthcare Interoperability Resources (FHIR) Standards for Trial Use 3 (STU3), new resource types like family member history, and patient extensions. Chris explained that the team also added support for exporting Health Level 7 (HL7) CQL Hooks requests based on the authored test cases. These requests can be used to invoke CDS Hooks endpoints exposed using CQL Services. The CDS Hooks requests are also packaged into Postman collections, allowing them to be used in the popular Postman developer tool for testing web services.

CQL Services was the CDS Connect prototype tool in CDS Connect's first year, and it provides a CQL execution service over a web application programming interface (API). There are two APIs, one of which is a custom API that allows you to execute CQL and get back all of the results of the CQL. The other API is called CQL Hooks, which is standards-based and exposes CQL according to the CDS Hooks standard. There are some limitations to the service, as all of the data has to be supplied in the *prefetch*. Chris reviewed how CQL Services works, showing how you can copy the CQL files into a folder in order to register them for use in the APIs. Chris also showed a typical CQL Hooks configuration, explaining how this relates to the CQL and how the CDS Hooks *cards* are returned using the CQL results. New features and capabilities have been added to CQL Services, such as being able to register multiple concurrent libraries and hooks, and support for CDS Hooks extensions to extend the data that the service provides. The MITRE team also added support of Docker, a popular approach to deploy services in the cloud or on LINUX servers with minimal configuration.

Chris then demonstrated the CQL Testing Framework, first displaying the test cases that were built for one of the CDS artifacts developed this year. He walked through how to use the Testing Framework.

Chris invited questions and comments from the WG. WG member comments:

a. A WG member asked what will be available on Docker images.

   i. Chris explained that for CQL Services, the docker image is the CQL Services framework itself. CDS Connect does not provide Docker images for specific artifacts, but rather provides the tooling so that users could implement it with this artifact or any other.
   ii. The WG member commented that other teams are using this approach in the HL7 DaVinci program.
b. A WG member asked about documentation. Chris displayed where additional information is located on CDS Connect, under Community/Technical Resources. This includes the link to GitHub, where the source code and documentation is found.
c. A WG member thanked the MITRE team for this development effort, as they feel it will be very useful.

Demonstrate New Parameter Type Features in the AT, Dylan Mahalingam (MITRE)

Dylan demonstrated the additional functionality built to support more robust parameters. You can now add expressions for each type of parameter. There is also additional functionality to prevent the user from modifying or deleting a parameter if it is in use. When you download the CQL, the parameters are defined near the top of the file and referenced by name wherever they are used throughout the file.

OY2 Pilot Update: Technical Approach and Status, Dave Winters (MITRE)

Dave provided information on the technical approach for the pilot this year. He mentioned that much of the work shown by Chris earlier for the prototype tools was used to support the pilot. Dave gave an overview of the pilot partner, b.well, and explained that this pilot was different than past pilots as the CDS-generate recommendations are being presented to patients. The CDS Connect team met with b.well during the pilot kickoff to communicate the primary components of the CDS artifacts. The first primary CDS component is the trigger, which launches the CDS service on the b.well platform. The CDS service used to deliver the CDS artifacts then checks for the components for the inclusions, exclusions and intervention. The CDS service includes the FHIR data model, the value set cache, the CQL logic and the execution engine. Dave also mentioned that the b.well development team was not familiar with CQL, although they had done some work with FHIR. He displayed a slide with a graphic depicting the test-driven development approach that was taken for developing the CQL logic of each of the CDS artifacts. This approach is meant to help limit any software bugs while expediting the development of the CQL. CDS Hooks is the integration method selected for the pilot this year. Dave discussed the data requirements for all five artifacts. He mentioned that FHIR Draft Standard for Trial Use 2 (DSTU2) was selected as the data model as two of the five artifacts had previously been developed using DSTU2, and this allowed MITRE to deliver these artifacts to b.well quickly, minimizing the schedule risk. All five artifacts have now been provided to b.well for integration.

CDS Connect Outreach and Demonstrations, MITRE

Ginny Meadows provided information on the panel discussion that was given at the AMIA 2019 Clinical Informatics Conference in Atlanta on May 2. The title of the presentation was *To Share is Human! CDS Connect: A Growing National Repository of Shareable, Interoperable Clinical Decision Support.* Panelists included Maria Michaels, Centers for Disease Control and Prevention, who provided an overview of the project "Adapting Clinical Guidelines for the Digital Age"; Jeremy Michel, Children's Hospital of Pennsylvania, who provided his experience with using the Authoring Tool and the Repository; and Kristen Miller, Medstar, who discussed the early results of the CDS Connect usability study she and her

team are working on. The panel was very well-attended, and the panelists have been invited to submit a manuscript for publication in the AMIA Applied Clinical Informatics Journal.

Open Discussion and Closeout

No one had any additional discussion, and the meeting was adjourned.