CDS (Clinical Decision Support) Connect Work Group
Meeting Summary
May 20, 2021
3:00 – 4:00 pm ET

Attendees: 43 people (41 attendees + 2 call-ins)

Organization	Attendee Names
AHRQ Members	Steve Bernstein, Roland Gamache, Ed Lomotan, Mario Terán (4)
Work Group (WG) Members	Noam Arzt ,Chandra Bondugula, Edna Boone, Joe Bormel, Melanie Combs-Dyer, Chris d'Autremont, Rina Dhopeshwarkar, Alex Goel, Ken Kawamoto, Preston Lee, Robert Lucero, Mario Macedo, Dan Malone, Russ Mardon, Maria Michaels, Peter Muir, Ryan Mullins, Neeraj Ojha, Jerry Osheroff, Mustafa Ozkaynak, Raajiv Ravi, Joshua Richardson, Max Alexander Sibilia, Andrey Soares, Matt Storer, R. Schwartz, Danny van Leeuwen, Sandra Zelman Lewis (28) Call-ins (2)
MITRE CDS Connect Members	Marisa Bellantonio, Noranda Brown, Matt Coarr, Dr. Susan Haas, Michelle Lenox, Dylan Mahalingam, Nichole Sweeney, Jacob Thomas, Chris Moesel (9)

MEETING OBJECTIVES

- Receive feedback on MITRE's artifact update process and share others' approaches to reviewing and updating CDS artifacts, with the goal of creating a useful base process to offer to CDS artifact authors.
- Share new CDS Connect features and available resources
- Discuss topics of interest to members relating to CDS Connect opportunities, including the launch of the patient-partnering panel

ACTION ITEMS

- WG members interested in participating in the upcoming patient-partnering panel over the summer should contact the MITRE team.
- WG members interested in learning more about the Center for Evidence and Practice Improvement (CEPI) Evidence Discovery And Retrieval (CEDAR) project should contact AHRQ.

MEETING SUMMARY

Following roll call and review of the agenda, the MITRE team presented their annual CDS artifact update process, asking asked for input from attendees about any different approaches or considerations for reviewing and updating CDS artifacts (e.g., different viewpoints on evaluating evidence, value sets, logic, and the Implementation Guides (IG). This presentation generated significant discussion from the WG about various processes that members use to update different artifacts.

Presentation: Sharing our Approach and Learning about Yours: CDS Artifact Annual Review and Update (MITRE)

Step 1: Identify and Incorporate Meaningful New Evidence

When MITRE updated CDS artifacts in March, its team included a new clinician and informaticist who were not involved in the original creation of the CDS artifacts. Their "fresh eyes" on the task led them to create a lengthy checklist detailing the artifact update process. This checklist in turn helped form the basis of a standardized process. This step has three components: searching for new evidence; deciding if that new evidence is meaningful; and incorporating it into Value Sets, Logic, and Metadata elements.

Step 2: Optimize Chosen Value Sets (VS)

MITRE's process for this step included confirming that code-system updates are reflected in the VS used in the artifact under review, identifying updates or deletions to the VS, searching for any related potential VS that have been added into Value Set Authority Center (VSAC) and compare them, and updating VS as needed, based on new information or availability of better VS choices. For MITRE-stewarded VS, the team creates an intensional definition for any that have been defined extensionally.

Step 3: Update and Test Logic

MITRE established steps to update and test the logic based on the new evidence or VS to be incorporated. The first involves clinical *concept* representation, in which VS and code references are added or replaced based on prior assessment of VSs and codes created by the clinician and informaticist. If VS content has changed without a commensurate change to the identifier, then a change in logic is not required. The second involves clinical *logic* representation, in which the updater determines what types of changes in logic (e.g., changes in lookback periods, algorithms, thresholds, inclusion criteria, exclusion criteria, recommendations) are required. Finally, the process concludes with updating any structured logic files as needed.

Step 4: Optimize Support for Implementers

During the February 2021 WG, RTI and Medstar discussed how IGs would vary by users. MITRE's process for reviewing IGs on an annual basis begins with evaluating each potential reason for an update to the IG, including evidence, logic (including new VS), knowledge level, interoperability standard, and receipt of implementation feedback from a pilot. The updater should revise technical implementation content if it has been changed, as well as include text explaining the impact of technical changes to users. In addition, this review should include any needed changes to clinician- or patient-facing text, as well as an update to the original Decision Log with each new decision and revise the IG's record of changes.

Discussion

Step 1: Identify and Incorporate Meaningful New Evidence

MITRE asked WG members to discuss their experiences and expectations around identifying and incorporating new evidence into their CDS work, regardless of whether it involves CDS Connect. MITRE asked about experiences with updating guidelines based on literature reviews, as well as any standard approach or framework they may have established for assessing the quality of evidence.

- A WG member shared that guidelines need to be updated as soon as new evidence comes out. They monitor the relevant literature to identify that new evidence at a regular interval (which may vary depending on the topic; a lot of research comes out quickly in some areas, and those topics need to be monitored more frequently than annually). The easiest thing to do is use the older search as a template and update the dates, then re-run them, and broadening the search strategies if necessary.

- The AHRQ evidence-based Care Transformation Support (ACTS) project is tackling the same problem of evidence currency—but with different stakeholders and a COVID-19 use case addressing anti-coagulation and steroids. A WG member noted that this collaborative supports those wanting to incorporate emerging evidence into their clinical systems; given the pace of COVID-19 research, however, new evidence becomes available on an almost daily basis rather than annually. In this immediate use case, ACTS is creating a localized version of their platform to customize the resulting evidence to their partners' needs. Eventually, the work will spawn a publicly accessible version of the platform that will integrate additional topics and resources. As part of this larger initiative, stakeholders are discussing requirements for future versions of the CDS Authoring Tool (AT), emphasizing how a user would incorporate information from that updating mechanism into the AT. Another WG member suggested that the fully functional ACTS platform include a feature notifying users that the source author is updating a resource, and when the expected release date might be. The meeting facilitator added that CDS developers would be interested users of this work. Relatedly, a WG member asked if this platform is considering a subscription model.

- A WG member asked if guidelines will be accessible through an Application Programming Interface (API) so that they can be more easily integrated into CDS apps. MITRE recommended this related, but out-of-scope topic be tabled for a future discussion. AHRQ briefly described its CEDAR project work that relates to the question about APIs for guidelines. CEDAR is a prototype API for discovering and retrieving evidence from their various repositories. WG members interested in learning more should contact AHRQ.

MITRE followed up by asking about experiences about determining the meaningfulness of new evidence, who makes that decision, and how they evaluate whether to update their artifact as a result.

- A WG member shared a potential counterexample where the need to update is unmistakable. In immunization decision support, the clinical guidance is very clear; the information comes through a structured review by a CDC advisory committee. Users are not usually left wondering whether underlying clinical guidance evidence changes are meaningful. In contrast, many MITRE artifacts are based on evidence processed internally to the organization; the team hopes to provide conceptual support for the determining whether new evidence sufficiently meaningful to trigger an update.

Step 2: Optimize Chosen Value Sets

- In one WG member's experience, many VSs were created for quality measures, and the re-use of these sets for CDS purposes requires some form of customization. Identifying and posting the intention of the VS would be helpful for updating and maintaining their work.

Step 3: Update and Test Logic

MITRE asked for input from WG members on additional insights for updating the concept and logic representation components.

- MITRE shared that reviewing how others have defined similar concepts can trigger an update, along with trying to identify opportunities for alignment with other sets. The widespread and regular use of libraries that define frequently used concepts and logic structures would encourage the use of common definitions.

- MITRE uses Clinical Quality Language (CQL) and Fast Healthcare Interoperability Resources (FHIR), so changes in these standards could possibly trigger a review. Nevertheless, the decision to update must be balanced with implementation; some of these specifications are on the cutting edge of use and have yet to be widely implemented.

- A WG member emphasized the need to update the FHIR test cases on the artifact. This reflects MITRE's approach as well; this best practice in software development extends to CDS development. A WG member asked about any materials on best practices for testing CDS logic. Although MITRE could not recommend a resource specific to testing CDS logic, best practices for software testing in general would apply. These would include ensuring edge cases are covered, testing boundaries, testing against minimum and maximum values in the logic (as well as cases that exceed these values), and conducting negative as well as positive testing. The facilitator provided a link (http://hl7.org/fhir/uv/cpg/methodology.html#validate-step) that includes checklists for L2, L3, and L4 levels developed by many stakeholders.

A WG member inquired whether a process is in place to collect feedback from the community on CDS artifacts or their CQL logic once the artifact has been implemented. MITRE continues to evolve that capability; this currently relies on emailing the point of contact listed on each CDS artifact. This allows a stakeholder to establish direct communication with the CDS artifact author, rather than relying on a feedback form in the tool itself or having a centralized process; how the author choses to respond will depend on the author and/or CDS artifact steward.

- When MITRE receives feedback on an artifact, the information will be considered during the next scheduled update cycle. That said, the timing of that update is partly dependent on the nature of the feedback. For example, if feedback shows something in an artifact is dangerous or has safety implications, then MITRE would respond immediately (e.g., blocking downloads of the CDS artifact until the issue is resolved).

A WG member highlighted other issues that might impact updates, citing the update cycles around clinical quality measures. They posed whether other sources (e.g., updates to codes; publications of measures by federal entities) should be taken into consideration in deciding when to update material.

- The facilitator shared that the example they saw most relevant to other cycles was that of value sets. Another WG member shared that the biggest impact to their process happens when the International Classification of Disease (ICD)-10 (and, to a lesser degree, SNOMED) is revised. July 1- October 1 is critical timing for their updating efforts, as they prepare for new codes being activated/required by the October 1 deadline.

- The facilitator emphasized how all this work - reviewing and updating CDS - supports the cycle envisioned with a learning health system. Evidence is transformed into guidance (i.e., guidelines), and guidance into decision support and quality measure tools, whose use then generates more evidence, and the cycle begins anew.

MITRE concluded the value set discussion with an observation that the trigger for updating an artifact might be occurring for some authors more frequently than annually and are tied to other timelines.

Step 4: Optimize Support for Implementers

MITRE asked WG members for other thoughts related to the topic of IGs and their use by developers and implementors.

- The facilitator asked for MITRE to clarify their definition of decision log - are they referring to the log from the CDS author who made the technical updates, or the log from the implementer side and how these were incorporated into the system and clinical workflows? MITRE shared their approach from the development perspective and included details on how the developer defined specific terms.

    - A WG member said in the chat that it may be important to consider what materials live on CDS Connect and what IG materials may live elsewhere, leading to how updates at other location get represented within CDS Connect. It was noted that there is no specific section in the CDS Connect artifact metadata editing form where the author would enter decision log information; it is instead expected to reside in the IG document. AHRQ added that hospital systems have all types of means of tracking decision support and implementation changes, not simply decision logs or single reference points.

    - A WG member shared their own best practice of CDS artifact versioning by using metadata tags to identify versions. They also make use of GIT to update artifacts, allowing that system to track and record changes between versions.

What's New with CDS Connect

The MITRE team discussed updates and features either recently implemented or remain in progress. New members of the development staff will focus on bringing additional updates and new features to the AT. The Prototype Tools now use CQL Services 2.0.0 with improved support for CQL 1.4/1.5 and FHIR server callbacks. In addition, the Repository team completed menu enhancements (e.g., changing "Artifacts" to "Repository") and continues to upgrade to Drupal 9, PHP 7.4, and the Acquia Dev Desktop development environment.

Announcements/Other Questions

MITRE announced an upcoming CDS Connect Patient Partnering Panel, which extends and focuses the discussion from the March and April 2021 WG meetings. MITRE extended an invitation to interested and engaged WG members—along with their patient or caregiver partners—to participate in these summer sessions. Interested WG members should contact Michelle Lenox (mlenox@mitre.org) or leave a message in the meeting chat. The recently sent May 2021 CDS Connect Update Email also included details about this effort.

Closing