Clinical Decision Support (CDS) Connect Work Group (WG)

Meeting Summary

July 15, 2021

3:00 – 4:30 pm ET

Attendees: 45 people, including 7 phone dial-ins

Organization	Attendees
AHRQ Sponsors	Rowland Gamache, Edwin Lomotan, Mary Nix, Steve Bernstein, Mario Terán (4)
WG Members	Maria Michaels, Bryan Kim, Chris d'Autremont, Danny Van Leeuwen, Dwayne Hoelscher, Edna Shenvi, Eric Pan, Jeremy Michel, Jerry Osheroff, Joe Bormel, Neeraj Ojha, Preston Lee, Susan Hassell, Sandra Zelman Lewis, Nathan Botts, Peter Muir, Raajiv Ravi, Bryn Rhodes, Matt Storer, Russ Mardon, Rina Dhopeshwarkar, Melanie Combs-Dyer, Alexander Sibilla, Mustafa Ozkaynak, Jacob Thomas, Chandra Bondugula, Alex Goel (27) Call-ins (7) Guests: Sue Shero, Randolph Barrows (2)
MITRE CDS Connect Members	Noranda Brown, Lacy Fabian, Michelle Lenox, Allie Rabinowitz, Dylan Mahalingam (5)

MEETING OBJECTIVES

- Welcome; brief review of meeting objectives and agenda
- Lessons Learned with CDS Connect: CDS for Asthma Management Guidelines
- Update: CDS Connect Authoring Tool Development and Repository enhancements
- Close

ACTION ITEMS

- None

MEETING SUMMARY

Following roll call and review of agenda, Ms. Susan Shera from the National Heart Lung and Blood Institute (NHLBI) and Dr. Randolph Barrows from Elimu Informatics reviewed their experience using CDS Connect to develop a CDS tool reflecting new medication recommendations in the National Institutes of Health's *2020 Focused Updates to the Asthma Management Guidelines: A Report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group*, referred to in this summary document as the Focused Update. This CDS tool assists prescribers in following a step-care framework for

selecting medications for asthma diagnosis, management, and treatment. Dr. Barrows described the challenges and lessons learned in using the CDS Connect platform, specifically the complications in using the Authoring Tool for their use case. Following a discussion of the topic, MITRE updated the WG on the progress of developing the Authoring Tool, Artifact Frequently Asked Questions (FAQ), and the ongoing enhancements to the Repository.

Welcome

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

Review of a CDS Connect Case Study

Ms. Shero gave an overview of the CDS Connect artifact in question. Its authors incorporated medication-prescribing information from the Focused Update, as well as the results of collaboration among NHLBI, Westat, Elimu Informatics, and a panel of experts. The artifact development group is working with the Centers for Disease Control and Prevention (CDC) to advance adapting clinical practice guidelines for the digital age, as well as partnering with AHRQ in developing CDS.

In addition to its recommendations about treatment and prescription updates for mild, moderate, and severe asthma, Dr. Barrows discussed the Focused Update's semistructured decision-making knowledge, taking the form of escalating steps of care to control progressively severe degrees of asthma. The developers chose to address both sets of recommendations so that the artifact could support incorporating these changes into real-world clinical practice.

The first step in the process involved identifying areas of asthma care that could benefit most from a CDS tool. The development team decided to take a "guardrail approach" to CDS alerting: The artifact would provide recommendations for preferred therapies only in certain circumstances. If a provider escalates a patient's therapy to the next step of preferred therapy, then no notification is triggered; if, on the other hand, a patient is on the preferred therapy for a step and the provider orders an escalation to the next step with a non-preferred therapy, then the CDS will trigger a notification to recommend the preferred medication.

This artifact underwent two phases of development, receiving ongoing feedback from a panel of asthma experts and making modifications as the development progresses. In the first phase, eight proposed event-condition-action rules incorporated the Focused Update's recommendations; the second phase focused on value sets (VS) in the VSAC authoring environment, CQL logic, extensive unit testing, FHIR library, and other sources.

Dr. Barrows acknowledged several advantages in using the Authoring Tool to develop CDS: it promotes learning; allows for non-programmer participation in the developing of CDS artifacts; enables export to a FHIR library; and provides an integrated testing environment. Nevertheless, the team did not use the tool for its use case. The Authoring Tool can only access published VS, a potentially prohibitive limitation; in addition, it does not support debugging of syntax and data errors (whereas text-editor tools such as Atom might allow that capability). Further, the Authoring Tool lacks the ability to add expression options or accommodate necessary filtering and restraint requirements.

Because this team was comprised of non-novice developers, they were able to develop code and in a more agile manner directly in text-editor software. Dr. Barrows recommended updating the Authoring Tool to improve its capability in a variety of technical areas.

The second phase of development for this CDS artifact is nearing completion. Next steps will involve packaging and documenting the artifact and submitting the tool to CDS Connect.

Discussion

Ms. Shero noted that this CDS tool focused on the specific area of asthma medication, as defined by the Focused Update. Although this effort was relatively defined in scope, interest exists to take a "living guideline" approach to the artifact by updating recommendations as new evidence and treatments become available.

A WG member asked how CQL can be used to code recommendations as actionable. Dr. Barrows suggested developing a named expression in a CQL logic statement that FHIR can reference. The expression will have an element for the conditional logic expression that determines whether actions should be taken. This interplay between the logic statement and the encompassing logic artifact allows for the recommendations to be actionable.

A WG member asked about any anticipated implementation concerns. Dr. Barrows responded that the team is creating a computable, fully specified, sharable artifact. The team is not yet at the implementation stage, but presume the ordinary efforts associated with implementation within a health system.

MITRE responded concern about the Authoring Tool having limited functionality of expressions. The team is currently working to create a new functionality, described as a "query builder," that allows users to create and customize modifiers having explicit properties on resources. This feature will address the limited functionality of currently available expressions.

A WG member asked what characteristics an ideal pilot for the artifact would feature. The literature shows CDS tools might be more appreciated in a primary-care practice—in this case, one that neither specializes in asthma treatment nor has many patients with asthma. Ideally, in Dr. Barrows's view, this tool would be piloted in a busy primary-care practice in an offline environment—a circumstance that allows evaluators to observe the functionality of the artifact's rules, and to monitor false positives and negatives when the notifications are not visible to users. Following such an offline pilot, the CDS tool would be turned off to generate feedback from actual users.

A WG member requested that those who lead piloting efforts consider the disparities and inequalities that may arise in implementing these types of tools. Projects might include a variety of medical organizations (not solely academic medical centers) that have relatively large information technology (IT) resources to support deployment of the technology. There are ways to apply these types of tools in organizations that might otherwise be left behind in technology development, such as by using less technologically intensive solutions. The WG member also highlighted the need to test CDS on multiple electronic health record (EHR) platforms and vendors. Another possibility is providing grants that fund piloting that is initiated by the investigators themselves; it would be very important to share information and lessons learned from these types of investigator-initiated projects.

Updates on CDS Connect Authoring Tool Development and Repository Enhancements

MITRE described the developments of the CDS Connect Authoring Tool, Artifact FAQs, and the CDS Connect Repository.

The CDS Authoring Tool has expanded to include:

1. A new summary tab within each artifact, communicating a high-level overview of artifact logic in a straightforward and readable way.
2. Context-sensitive help links in locations near functionality that may be complex or have associated documentation.
3. Clearer and more-informative error messages guiding a user about how to remedy the issue.
4. Ongoing development of a query builder to express the criteria defining an artifact in addition to the predefined expressions listed in the tool.
5. Continued bug fixes and updates for reusability and maintainability as they arise.

MITRE informed the WG that Artifact FAQs have been revised, and that a new downloadable “at-a-glance” overview of the artifact update and review process has been posted.

The Repository has been updated to include:

1. A signup form to ask users how they learned about CDS connect is in testing.
2. Added taglines to summary reports for better findability (nearly deployed).
3. Continuous UI changes.
4. CPG-on-FHIR support.
5. Updates to user documentation.
6. Updates to software and security patches, including support for Drupal 9 and finding a replacement for Aquia Dev Desktop.
7. Continued technical support for Repository contributors.

Announcements/Other Questions

A WG member recommended that the group review archived sessions from the Digital Quality Summit, which took place July 13 – 15, 2021. The Track 3 sessions and the general sessions are highly relevant to CDS Connect’s ongoing work.

Closing