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

Meeting Summary

August 19, 2021

3:00 – 4:30 pm ET

Attendees: 42 people, including 4 phone dial-ins

Agency for Healthcare Research and Quality (AHRQ) Sponsors	Steve Bernstein, Roland Gamache, Edwin Lomotan, Mario Teran, James Swiger (5)
WG Members	Chris d'Autremont, Randolph Barrows, Zaynep Behjet, Joe Bormel, Dave Carlson, Priyanka Desai, India Duncan, Diana Eastman, Alison Kemp, Anthony Gerardi, Dan Malone, Maria Michaels, Jeremy Michel, Peter Muir, Ryan Mullins, Mary Nix, Neeraj Ojha, Jerry Osheroff, Andrey Soares, Stephanie Schneiderman, Jeff Solomon, Matt Storer (22) Call-ins (4)
MITRE CDS Connect Members	Noranda Brown, Matt Coarr, Lacy Fabian, Susan Haas, Michelle Lenox, Chris Moesel, Allie Rabinowitz (7)
MITRE CEDAR Members	Michelle Caputy, Pete Krautscheid, Allen Leavens, Kathy Mikk (4)

MEETING OBJECTIVES

- Welcome; brief review of meeting objectives and agenda
- Introduction to AHRQ Center for Evidence and Practice Improvement (CEPI) Evidence Discovery And Retrieval (CEDAR)
- Update on CDS Connect Authoring Tool Development and Repository enhancements
- Close

ACTION ITEMS

- WG Members interested in partnering to pilot CEDAR should contact a member of the CEDAR Team.

MEETING SUMMARY

Following roll call and review of agenda, AHRQ and MITRE team members reviewed an AHRQ CEDAR tool that indexes patient-centered outcomes research (PCOR) findings housed in multiple CEPI

repositories, allowing a user to search for relevant findings across multiple repositories in one place. Following a discussion of the topic, MITRE updated the WG on its progress in developing the Authoring Tool, updating the CDS Connect website, and implementing ongoing enhancements to the Repository.

Overview of the CEDAR Tool

Ed Lomotan represented AHRQ during this presentation; Pete Krautscheid, Michelle Caputy, and Allen Leavens represented the MITRE CEDAR Team. Dr. Lomotan began the session with an overview of CEPI and CEDAR. CEPI houses several PCOR repositories within AHRQ, including the Evidence-based Practice Center (EPC) program, United States Preventive Services Task Force (USPSTF) recommendations, and CDS Connect. These repositories serve different purposes and missions, resulting in different repository architectures.

CEDAR's purpose is to make PCOR findings within AHRQ's CEPI repositories better aligned with Findable, Accessible, Interoperable, and Reusable (FAIR) guiding principles. This work supports the development of prototype infrastructure that demonstrates standards-based, application programming interface (API)-enabled discovery and retrieval of underlying PCOR findings within all CEPI repositories.

Mr. Krautscheid, the CEDAR Technical Lead at MITRE, reviewed the conceptual operations of CEDAR. The tool is designed to facilitate the discovery and retrieval of artifacts across the CEPI repositories. CEDAR is searchable using an API, supports Fast Healthcare Interoperability Resource (FHIR) search requests, and leverages the FHIR Citation Resource to represent artifact metadata. CEDAR imports and indexes artifacts, and periodically reindexes. The tool is built on a base of open-source components, and the CEDAR software is anticipated to be released via open-source. CEDAR is deployed as a set of Docker containers; the CEDAR API, CEDAR Admin, and CEDAR Indexing modules are implemented using the Ruby programming language (with Sinatra and Rails as frameworks within Ruby). The CEDAR Datastore provides a centralized datastore for CEDAR using a PostgreSQL database-based container.

Mr. Krautscheid demonstrated the tool using different interfaces—one applicable to a clinician, and one fitted to the needs of a researcher. In the clinician-facing interface demonstration, CEDAR provides an API that integrates with electronic health record (EHR) technology using SMART on FHIR. The clinician user can select an individual patient of interest; the patient's conditions can then be used to request applicable results across the CEPI repositories in one view. Search results can be narrowed either by selecting a second condition or by adding keywords. Search results display as a list of artifact names and summaries. In this way, CEDAR can be used in the clinical setting to identify CDS relevant to an individual patient, demonstrating the value of a flexible API. The second demonstration highlighted how a clinician or researcher might search for artifacts across CEPI repositories by area of interest, then narrowing the results by artifact status, artifact publishers, artifact title, and keyword. This use case demonstrates the ability to locate artifacts of interest with

one search, rather than opening multiple repositories in CEPI separately and conducting an independent search within each.

Ms. Caputy then reviewed the efforts to test the platform against the guiding principles of FAIR. The MITRE Team developed a stand-alone tool to assess FAIR principles of PCOR findings. This 14-question tool adapts the FAIR principles to align with the health information technology (IT) aspects of PCOR findings. The developed methodology generates an overall score of how aligned the repository is with FAIR. As CEDAR continues to develop, the scores of underlying PCOR findings are expected to increase. The full CEDAR FAIR scoring tool may be available in the future.

Dr. Leavens advised attendees that the CEDAR Team intends to partner with an organization to pilot the CEDAR tool. The CEDAR Team hopes to identify and partner with organizations who have prior experience with developing, consuming, or applying findings from PCOR; have used at least one of the CEPI repositories; and have sufficient technical expertise to either develop client applications or deploy them using the CEDAR API. Dr. Leavens invited any interested WG member suggest any such organization to the CEDAR Team.

Discussion

MITRE inquired about the approach for using keywords across repositories. The keywords are taken from the original artifacts within the individual repositories; the CEDAR Team does not perform additional extraction or generation. MITRE asked for elaboration on the CEDAR Team's experience in building a common interface across a broad set of sources. Although each repository is different, the CEDAR Team acknowledged that they are fortunate that most CEPI repositories have existing APIs. These APIs provide a formal approach to integration. In cases where APIs are not available, the team must parse content from HTML pages, a task that presents unique challenges because the content structure is less formal than APIs and more likely to change without notice. Furthermore, the CEDAR Team has successfully engaged with the repositories to develop data feeds that can be machine-ingested.

Dr. Lomotan asked the WG members to identify possible users of CEDAR (e.g., patients, clinicians, vendors) and what use cases would be helpful to further convey how users can access the tool. A WG member suggested that a helpful use case could involve applying CEDAR to a researcher who is planning to initiate a study; that researcher can consult CEDAR prior to hypothesis generation to investigate the latest evidence and avoid potential duplication of efforts.

A WG member provided feedback on the demonstration of a clinician consulting CEDAR in reference to a patient's EHR. CEDAR can use Boolean searching to identify relevant artifacts across platforms; nevertheless, CEDAR is not capable of combining or overlining multiple CDS artifacts that might be applicable to a patient with multiple conditions. The WG member recommended expanding CDS options to incorporate an overlying look of multiple guidelines, evidence, and practices to reflect the fact that patients commonly have more than one medical condition.

A WG member noted that using the CEDAR tool in the clinical setting might be unrealistic. A clinician might have a use for CDS tools at certain points in the healthcare workflow but might find it impractical to search for CDS artifacts during the clinical encounter.

A WG member inquired about the citation summary styles used in CEDAR. Currently, citations are used to provide information on the indexed artifacts within CEDAR. Moreover, the FHIR Citation standard is still being developed; the CEDAR Team's work will include ensuring that CEDAR implementation continues to align with the standard. The WG member suggested that this work supports the ultimate development of a stable format for all citations so that source references are clear and understandable.

A WG member offered to share information on the AHRQ evidence-based Care Transformation Support (ACTS) COVID Collaborative, which is working to produce a Learning Health System (LHS) Concept Demonstration that illustrates an "art of the possible" patient journey consistent with the healthcare aims of better health, better experience, lower cost, improved work life for staff, and equity. This initiative describes stakeholder needs around the LHS cycle (from evidence to action to data, and back to evidence).

Updates on CDS Connect Authoring Tool Development and Repository Enhancements

The MITRE team discussed updates and features that have been recently implemented or remain in progress. The revised Authoring Tool better supports the use of base elements as arguments to external CQL functions. Additionally, the Authoring Tool now integrates with the Value Set Authority Center (VSAC) via its new FHIR R4 API endpoints. The team continues its work to implement a "query builder" feature that will supports more-detailed CQL queries. Last, the team continues to implement bug fixes, as well as usability and maintainability improvements.

MITRE and AHRQ continue to collaborate to complete updates on Implementation Guides and CQL logic for four artifacts:

- CMS's Million Hearts® Model Longitudinal ASCVD Risk Assessment Tool for Baseline 10-Year ASCVD Risk
- Abnormal Blood Glucose and Type 2 Diabetes Mellitus: Part One Screening
- Abnormal Blood Glucose and Type 2 Diabetes Mellitus: Part Two Counseling
- Healthful Diet and Physical Activity for CVD Prevention in Adults with Cardiovascular Risk Factors.

The Repository features revised frequently asked questions (FAQ) content, as well as a new welcome message on the main Repository page. The Repository signup form now includes a question for requestors to indicate how they learned about CDS Connect, as well as taglines on summary reports for enhanced findability. The CDS Connect WG page now includes a call for presentations that will review best practices and improve the platform. In addition to its work on Clinical Practice Guidelines on FHIR (CPG-on-FHIR) the Repository team continues to update software and security practices, and to support Repository contributors. The Repository upgrade to Drupal 9 is continuing in development

and custom module code is being changed to replace deprecated API calls. The MITRE team plans to attempt the upgrade to Drupal 9 on its development server during the next sprint.

Closing