Electronic Clinical Quality Measures (eCQM) Development and Maintenance for Eligible Professionals

Support Contractor

Electronic Clinical Quality Measure (eCQM) Clinical Quality Language (CQL) Basics for Eligible Professionals and Eligible Clinicians

Questions and Answers

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The following document provides actual questions from audience participants. Webinar attendees submitted the following questions and subject-matter experts provided the responses during the live webinar. The questions and answers may have been edited for grammar.

Question 1: **How is Clinical Quality Language (CQL) related to any changes in reporting for electronic clinical data systems?**

CQL helps to more clearly define how to pull the data from the electronic record. It does not impact the method of reporting.

Question 2: **Can you summarize what is CQL?**

CQL is a high-level language for encoding clinical knowledge. It is a core language that is augmented with support for constructs that are ubiquitous in healthcare settings and inner roles which allow temporal expressions and terminologies as elements.

Question 3: **The next question is in relation to medications, such as those for the VTE prophylaxis measure. If administered in the emergency room (ER) prior to the start of the inpatient encounter, would the new CQL qualify this patient? Our encounter numbers stay the same from emergency department to in-patient.**

Yes, if you look at many of the hospital measures, you will see a new function called *Hospitalization*, which is intended to capture where there is an emergency department (ED) visit prior to an in-patient encounter. The measure is looking at the period from the ED admission, all the way through discharge from the hospital. As a result, you will see the hospitalization function is used to determine that. Rather than looking for the administration in the in-patient encounter, we look for the administration anywhere in the start of the ED visit to the end of the patient encounter.

Question 4: **Generally, clinical documentation is focused on affirmative or positive findings, and not documentation of what was not done; negation rationale in other words. Can you speak to the impact of that requirement in terms of changes required and documentation?**

We at CMS don't believe any of that is changed. The negation rationale and documentation of what was not done was used in electronic clinical quality measures (eCQMs) prior to implementation of CQL. The implementation of CQL is specific to the logic portion of eCQMs, not documentation.

Question 5: **This question came across within CMS version 7. Can you explain what flattened means?**

Flatten takes a list of lists and returns the elements in all of the lists as a single list. So, for the first element, it is itself a list of 1, 2, and 3. The second element is a list of 4, 5, and 6. Then *Flatten* will return a list with elements of 1, 2, 3, 4, 5, and 6. Further information on this operator is available in the CQL specification.

Question 6: **The next question is related to episode-based measures. How do you express negation logic and would it return a negative type? The Measure Authoring Tool (MAT) does not package return types and they are not the same in all population criteria.**

Typically, negation logic is used as part of a relationship to the primary element. If you have a measure of encounters performed, you would be looking for things that didn't happen during that encounter. If you had a measure that was looking for encounters not performed, that would be a different population. It would also be a different base population.

Question 7: **When comparing time periods, such as with 'during' operations, are they inclusive comparisons? For example, greater than or equal to the start and less than or equal to the end.**

Yes, for the *during* operation specifically, those are inclusive comparisons. In the specifications, we go into great detail on what exactly each of the interval-based operators mean. The specification describes each of the interval operators in terms of the start and stop of each interval in the comparison. But, yes with *during*, those are inclusive comparisons.

Question 8: **What is prevalence period and relevance period? Please explain the differences between both.**

The Quality Data Model (QDM) specification, rather than CQL, defines prevalence vs. relevant period. While similar, in that they refer to the period between a start and end time, the prevalence period is limited to diagnoses, allergies, and symptoms and refers to the time between onset and abatement of such. The relevant period is used for all other QDM datatypes.

Question 9: Can you please share a reference of implementation for CQL? For example, a reference implementation which parses the CQL, interprets a logic block into code, and then acts on the patient data model.

Yes, we do have a tools repository that we provided in tools and resources, as well as a page on the Electronic Clinical Quality Improvement (eCQI) Resource Center. There is currently both a Java Script and a Java CQL interpreter. Also, the tools repository has a CQL translator that is built in Java that actually takes the CQL and turns it into a machine-readable representation.

Question 10: Can you discuss the relationship between CQL and Business Process Model Notation (BPMN)?

BPMN can reference expressions of different flavors and different languages. So, CQL can be used within a BPMN model to provide criteria for branching and flow. It can also be used to define actions that you would want to take within a particular process. You can also use it to define the input and output parameters for any given node within the model.

Question 11: Can you please give more examples of intersect and except and what these terms mean to the logic?

Within the CQL specification, there are good examples, as well as diagrams. Basically, the *intersect* takes two lists and returns only the items that are present in both lists. For example, if you have two lists of 1, 2, 3 and 2, 3, 4, the *intersect* will return 2, 3, and the *except* will return 1. These operators also work with intervals. The *intersect* of intervals returns the overlap of the intervals and the *except* of intervals returns the portion of the first interval that does not overlap the second.

Question 12: In which reporting year will CQL be expected to be fully implemented?

The measure specifications that were published in 2018 are using CQL logic. It is for implementation beginning January 1, 2019, for both hospital and clinician eCQMs.

Question 13: **What is the overall goal of CQL versus the Measure Authorizing Tool (MAT)? What are the advantages of CQL, it's much harder to read.**

With QDM logic, there were patterns in quality measures we wanted to express but could not, as well as a lot of ambiguity around timing phrases. We were faced with the choice of expanding QDM or breaking out the logic portions of QDM into a separate specification, which has many advantages in terms of architecture. CQL can focus on supporting the ability to express logic and QDM can focus on supporting the conceptual data model description. Those two specifications can evolve independently and CQL can be used in different domains. It can be used in cohort definitions or decision support. We tried very hard to make the syntax of CQL familiar to those using QDM. CQL is necessarily more sophisticated then QDM because it supports more functionality.

Subject-matter experts researched and answered the following questions after the live webinar. This content may have been edited.

Question 14: **Can the CQL model be used for any kind of clinical-decision support (CDS) quality measure besides electronic clinical quality measures (eCQMs)?**

Yes, one of the many benefits of using CQL is that it is able to be used both across eCQMs and clinical-decision support (CDS).

Question 15: **What are the key differences between CQL and the previous language?**

CQL implementation is designed to address many of the issues encountered with previous eCQM specifications (using QDM-logic). It allows for increased precision (reduced ambiguities) and improved specificity, provides the ability to share between decision support rules and quality measures, and improves the ease of building language processing applications. CQL-based eCQMs are intended to provide as much opportunity for automated interpretation as possible. QDM-based logic measures have often been manually translated for implementation, which results in ongoing costs as measure specifications are updated annually.

Question 16:   **How can we use CQL against a database?**

CQL represents all access to data from systems using the retrieve operation, which has a very specific and constrained interface. This interface is designed to be as easy as possible to implement against a variety of potential data sources and paradigms. So if you have an engine that uses this interface, then integrating with a database system is a matter of implementing this interface for the environments query application program interface (API). The reference implementations already do this for a simplified structured query language (SQL) database with Java database connectivity (JDBC).

Question 17:   **Is there a reference implementation for parsing and computing CQL?**

Yes, the CQFramework GitHub repository has a clinical_quality_language project that is a fully capable, production implementation of the translator from CQL to expression logic model (ELM). That same repository also has a JavaScript CQL interpreter. There are also other open source projects that implement CQL evaluation in Java.

Question 18:   **What do you see as the data integration between providers and payers?**

That will depend of course on the nature of each system, and CQL is intentionally silent about what that looks like because it is (and needs to be) an implementation decision driven by the specific needs of each environment and exchange relationship.

Question 19:   **Will there be a reference tool to help define side-by-side differences in measure specifications as a whole?**

CMS does not provide a tool to show a side-by-side comparison of the measure specifications. Current and historic versions of the measure specifications, as well as information on the standards, such as CQL, are available on the eCQI Resource Center.

Question 20:   **In the description, will you tell us in advance which measures each webinar will cover in detail?**

Yes, for the coming webinars on eCQMs the registration announcement will include which measures will be discussed in detail.

Question 21: **Why can't you describe these requirements in a manner that is more understandable (i.e., information on patients' names, age, date of birth, duration of visit, current medications, doses, mode, etc.)?**

The data criteria section of the human readable already does this for the data elements and terminologies used in the measures. While it is an initial learning curve moving from QDM-logic interpretation to CQL-logic (in the Population Criteria and Definitions of the human readable), it is important to note that CQL-based eCQMs are intended to provide as much opportunity for automated interpretation as possible. CMS program measures are developed and updated using a style guide to promote the use of consistent language and ensure that CQL definitions used in the respective measures: are clear, provide context on the logic expression, are clinically meaningful, and are unique. Testing of CQL-based eCQMs, prior to CMS' transition, indicated that more simplified CQL definitions resulted in greater confusion, rather than clarity.

Question 22: **What business roles is this presentation geared towards?**

The intended roles are clinical quality professionals, the individuals responsible for assessing and improving the quality of care within an organization. This could include, but not limited to, health IT vendors, measure implementers, quality analysts, etc.

Question 23: **Is this the platform electronic health record (EHR) vendors should be using to capture criteria to meet goals of Healthcare Effectiveness Data and Information Set (HEDIS) quality measures?**

The National Committee for Quality Assurance (NCQA) has, through efforts like the Digital Measures Collaborative and events like the Digital Quality Measure Summit, been actively engaging with stakeholders and industry on this question. We encourage you to visit NCQA's website for more information on those initiatives.

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Question 24: **How do you learn to interpret CQL? As a chart abstractor working with the IT department, I'm not used to reading specifications and terminology this way. Can you help and has CMS considered a way for someone to ask questions besides using JIRA?**

It is an initial learning curve moving from QDM-logic interpretation to CQL-logic and there are some resources available to support your learning, in addition to reviewing the CQL specification itself:

1) eCQI Resource Center CQL Tools and Resources page https://ecqi.healthit.gov/cql-clinical-quality-language#quicktabs-tabs_cql3, which includes links to a Side-by Side Comparison presentation and recording (both EP and EH measures)

2) Guide for Reading eCQMs https://ecqi.healthit.gov/system/files/Guide-for-Reading-Electronic-Clinical-Quality-Measures-v4-0-2018-0504.pdf

3) eCQM Measure Logic Guidance document https://ecqi.healthit.gov/system/files/eCQM-Logic-and-Guidance-2018-0504.pdf

CMS offers other webinars periodically to support learning CQL, however there are no offerings at this time for 1:1 training. ONC Project Tracking System (JIRA) is the best means for asking questions. If your questions cannot be addressed using the resources above, you can reach to the appropriate JIRA tracker:

1) eCQM for questions about measure intent or interpretation
2) CQL tracker for technical implementation or general CQL questions
3) QDM tracker for questions about data model application