CQL Training for Measure Developers Session - April 27, 2016 – SESSION 1

Q: How do I sign up for the upcoming CQL events?
A. Please visit the eCQI Resource Center CQL page Connect tab for instructions on how to register for upcoming CQL sessions.
Link: https://ecqi.healthit.gov/cql-clinical-quality-language#quicktabs-tabs_cql4

Questions under QDM

Q: Does every query require a check for 'negationRationale' (is null/not null) OR is it only required if the measure is concerned about whether or not the clinician documented a 'negation'.
A: No, the approach to representing negation with CQL and QDM has changed based on feedback from and discussion with the CQL community. The negationRationale null check is no longer required. Instead, a “Not” modifier is used as part of the QDM data element description within the CQL retrieve. If this modifier is present, the result will be negated data elements, otherwise, only positive data elements will be returned.
For example:

```
define "Antithrombotic Administered":
  ["Medication, Administered": "Antithrombotic Therapy"]
```

The above expression will return all Antithrombotic Therapy Medication Administrations that were performed. To retrieve medications that were not administered, use the “Not” modifier:

```
define "Antithrombotic Not Administered":
   ["Medication, Not Administered": "Antithrombotic Therapy"] NotAdministered
      where NotAdministered.negationRationale in "Medical Reason"
```

Note that this is a negative assertion; results will only be returned if the reporting systems actually record these types of assertions (that a particular medication was not administered). There is no expectation that reporting systems would be required to infer that a given medication was not administered in order to return results from a query such as the above.
For a more detailed discussion of the representation of negation in CQL with QDM, refer to the following page: https://github.com/esacinc/CQL-Formatting-and-Usage-Wiki/wiki/Negation-in-QDM.

Q. How do you know which version of the QDM you are using?
A: The using declaration within a CQL library specifies the version of the data model being used. For example, using QDM version 5.4.

Q: Where do we find what attributes exists for a particular element like Encounters, Performed?
A: The QDM specification will continue to define this information. For more information and to review the most current versions of the QDM specification, visit the QDM page on the eCQI Resource Center.

Questions under Measure Representation

Q: How does CQL capture the concepts of Initial Patient Population or numerator and denominator?

A: HQMF specifies the population criteria, but instead of defining that within the HQMF as previously executed, it points to CQL. Refer to the CQL-based HQMF IG for examples and the CQL Formatting and Usage Wiki: Specifying Population Criteria.

Link: http://www.hl7.org/implement/standards/product_brief.cfm?product_id=405

Q: Are CQL specifications defining eCQM measure sets?

A: The CQL specification itself does not define how measures are to be expressed, it only provides a mechanism to describe logic related to the quality domains of decision support and quality measurement. Additional guidance describing how CQL is used to create measures is provided in the CQL-Based HQMF IG, as well as the currently under-development CQF-on-FHIR IG.

Link: http://www.hl7.org/implement/standards/product_brief.cfm?product_id=405

Q: For execution, what is the advantage of using ELM versus the ANTLR parse tree?

A: The ANTLR parse tree will be a direct representation of the input CQL. You will have to do type verification and type inference and operator resolution in order to support that type verification. You would also have to do the implicit conversions and generic type extension. There are a lot of things that the CQL supports, higher level constructs like timing phrases that are translated into a representation in ELM that is focused on implementation so that you don't have to worry about those pieces within ELM. There is nothing that says you couldn't do all that yourself but for implementation, using ELM takes each of those pieces off an implementer's plate. Individually each of those aren't terribly difficult but when you put them all together and add them all up, together with the fact that it's maintained as a part of this whole infrastructure, it's a significant advantage to be able to use the ELM directly rather than have to start directly from a parser.

Link:
https://ecqi.healthit.gov/system/files/Clinical_Quality_Language_Training_for_Measure_Developers_Updated_12.8.2017v2_508.pdf

Q: If both CQL and ELM are available, is it possible to build parsing logic around the CQL instead of the ELM? Is that not recommended?

A: Yes, it is possible and we do provide a CQL ANTLR grammar just like on the previous question. The ANTLR tooling is great. It provides easy to use generated visitor and/or listener code depending on which mode you use it in. In fact the CQL-ELM translator is implemented using a generated ANTLR visitor. The advantages are those uses that I've mentioned, you've got the ELM representation that's focused on implementation. Rather than CQL representation, which is focused on high level representation that's human readable and natural language expression of timing, and clinical concepts.

Link:
https://ecqi.healthit.gov/system/files/Clinical_Quality_Language_Training_for_Measure_Developers_Updated_12.8.2017v2_508.pdf

Q: Do the CQL changes impact the human readable specifications currently published with each eCQM? If yes, where can we go to understand the changes? Is there an example available that shows current and future?
A: Yes, the human readable that's currently part of the HTML for each measure and uses QDM, will actually use CQL now. Measures with CQL are published so you can see the HTML on the 2019 EP/EC and EH/CAH pages. There are also examples in the Side-by-Side presentations on the CQL Education page.
Link: https://ecqi.healthit.gov/cql-clinical-quality-language#quicktabs-tabs_cql3
Link: https://ecqi.healthit.gov/system/files/Guide-for-Reading-Electronic-Clinical-Quality-Measures-v4-0-2018-0504.pdf

Q: Q: Do you imagine that ELM would be used to exchange eCQM data between organizations, or CQL which is more human readable?
A: That depends on the target of the sharing. I agree that if your intent is to share between clinicians or human readers or even eventually integrators, if the readers are human CQL would be a better way to share that, but if the intent is to automate sharing of that measure definition, then CQL introduces another level of functionality and the ELM that is underneath provides an easy way to get to that more machine friendly representation. There is nothing that says you couldn't share at the CQL level even for integration, it's a formal language and it supports accurate and computable representation of the measure logic. It's just that the CQL to ELM translator and that representation provides an easy way to get past all of those traditional hurdles of building a new compiler or interpreter.

Q: Can you speak to the relationship between the ELM and HQMF? Will ELM be nested inside of an HQMF?
A: There is a release 1.2 of HQMF that extends this standard in a very simple way to be able to reference an external document. And the way that the CQL based HQMF IG then uses that extension for HQMF is to specify that the logic for the criteria expressed within the HQMF is actually specified in the ELM document. That document is a library just like the example we showed in the ELM library that actually contains the logic and then the HQMF will be the criteria that will actually point to an expression to find in that ELM document. So no, it won't be nested inside the HQMF, it will just be referenced as a separate document and then each criteria will point to specific expressions within the ELM.

Q: Is there a change to the method of receiving measure specifications from eCQMs?
A: eCQMs are still distributed using HQMF, but the logic involved is contained in separate CQL and ELM documents distributed along with the HQMF and the criteria in the HQMF document reference expressions defined in the CQL/ELM library.

Q: For an encounter with lab test performed during the encounter, is <during> the appropriate comparator?
A: Potentially no. A more clinically relevant example can use <ordered during> the encounter relevant period if that element is available.

Q: Does union return a unique code for both diagnosis of asthma and other illness?
A: As of CQL version 1.2, the use of the distinct keyword with unions is not required because duplicates are automatically eliminated by the union.