Cooking with CQL Q&As – Session 48

Thursday, October 29, 2020

# Date and Time Calculations

**Q:** In the Lab Tests Every Six Weeks Revisited example where lab tests need to happen every six weeks or LESS while the therapy is ongoing, why have you chosen to use days instead of weeks?

|  |
| --- |
| define "Has Lab Test Intervals More Than Six Weeks": |
| "Valid Lab Test Intervals" LTI |  |
| where duration in days of LTI > 42 |  |
| define "Numerator": | | |
| Count("Valid Lab Test Intervals") >= 2 | | |  |
| and not exists "Has Lab Test Intervals More Than Six Weeks" | | |  |

**A:** We do not want tests performed in the 6th week. If you have a test that is performed at 6 weeks and 1 day, the duration would be 6 weeks since it has not yet hit the 7th week. Any test that is performed up to the day before the 7th week will still render as 6 weeks and since we do not want to count tests performed in the 6th week we need to use days.

**Q:** In the Lab Tests Every Six Weeks Revisited example where lab tests need to be performed every six weeks or LESS while the therapy is ongoing, how do you indicate that you are only concerned with the 1st 12 months of testing if the therapy starts prior to the testing measurement period?

**A:** To achieve this you can bound the start of chemotherapy to the start of the measurement period:

|  |
| --- |
| 2019/11/01 |
|  | |--------------|----------------|----------------|--------------| |
|  | |----------------------------------| |
|  | 2020/01/01 2020/12/31 |
|  | |--------------|----------| |
|  | 2020/11/01 |

In this example, the measurement period is defined as:

|  |
| --- |
| define "Chemotherapy During Measurement Period": |
| ["Medication, Active": "Chemotherapy for Advanced Cancer"] Chemotherapy |  |
| where ( Chemotherapy.relevantPeriod starts 1 year or less before start "Measurement Period" |  |
| //and Chemotherapy.relevantPeriod overlaps "Measurement Period" |  |
| ) |  |

where the start of the chemotherapy (2019/11/01) is bound to the start of the measurement period (2020/01/01) and is defined as:

|  |
| --- |
| define "Start of Chemotherapy During Measurement Period": |
| Min("Chemotherapy During Measurement Period" Chemotherapy |  |
| return start of Chemotherapy.relevantPeriod |  |
| ) |  |

The expression for the end of the measurement period is:

|  |
| --- |
| define "End of Chemotherapy During Measurement Period": |
| Min({ |  |
| end of "Measurement Period", |  |
| "Start of Chemotherapy During Measurement Period" + 1 year, |  |
| Max("Chemotherapy During Measurement Period" Chemotherapy |  |
| return end of Chemotherapy.relevantPeriod ) |  |
| }) |  |

**Q:** When discussing the normalizeInterval function, if the period is not known and the period only contains low with high as null flavor, will this function use the low to populate both periods?

|  |  |  |
| --- | --- | --- |
| define function "NormalizeInterval"(pointInTime DateTime, period Interval<DateTime>): | | |
| if pointInTime is not null then Interval[pointInTime, pointInTime] |
| else if period is not null then period | |
| else null as Interval<DateTime> | |

**A:** No because this function does not look inside the period that is provided. If a period is provided, it will return a result such as: if pointInTime is not null then Interval[pointInTime, pointInTime]. If the end point is null, it will stay as null. Even if the interval provided has null for both high and low, this function will still return this type of result since it is not a null interval; it is an interval with null boundaries.

**Q:** When utilizing the normalizeInterval guidance, how do you clearly convey to the person retrieving the information how they should calculate the timing criteria?

**A:** You need to specify how you want the comparison to happen (e.g., start of or end of the interval). The example is concerned with the start of the interval; it starts 12 months or less before the start of “Measurement Period”.

|  |  |
| --- | --- |
| ["Procedure, Performed": "Primary TKA Procedure"] TKAProcedure | |
|  | where Global."NormalizeInterval"(TKAProcedure.relevantDatetime, TKAProcedure.relevantPeriod) |
|  | starts 12 months or less before start of "Measurement Period" |

Given that this "NormalizeInterval" will return an interval, the authoring environment will ensure that your timing phrase makes sense for that type. If you are comparing to a date, you have to consider the question of whether the comparison is to the start or end of the interval returned from NormalizeInterval.

**Q:** The 2021 HL7 and CMS QRDA Implementation Guides are not using the normalizeInterval function, but are using relevantPeriod and the period could be a dateTime or a period. If the QRDA file only includes a period, but the criteria is looking for a point of time, should we always pick the start of the period, end of the period, or consult the measure author to see which one is the intent of the measure?

**A:** The guidance would be to consult the measure author to confirm the intent of the measure. There are variations in the use of every data type such that either representation should be considered as part of the criteria in every case. Please submit all questions through the eCQM JIRA Issue Tracker by creating an issue ticket using the following link: <https://oncprojectracking.healthit.gov/support/secure/CreateIssue!default.jspa>.

**Q:** For interval boundary access, what is the rationale for defining the Latest function?

|  |  |  |
| --- | --- | --- |
| define function Latest(period Interval<DateTime>): | | |
|  | if (HasEnd(period)) then |
|  | end of period |
|  | Else |
|  | start of period |

And what will this Latest normalizeInterval function return?

//Latest(NormalizeInterval(Procedure.relevantDateTime, Procedure.relevantPeriod))

**A:** The Latest function is only used for a dateTime interval. The Latest normalizeInterval function will return the latest point in the interval that is specified. If the dateTime interval has an end, meaning it does not have a null ending boundary, then the Latest function is going to return the end of that dateTime interval. Otherwise, the Latest function will return the start of that dateTime interval.

**Q:** For interval boundary access, are both the Latest and normalizeInterval functions applicable for the 2021 Annual Measure updates when we have six or seven data elements each of which have relevantDatetime and relevantPeriod?

**A:** Yes, the Latest (used when the measure only requires one dateTime point) and NormalizeInterval functions need to be applied for any data element that has both relevantDatetime and relevantPeriod for the 2021 Annual Update. From the clinical perspective, the use of start time or end time needs to be determined by the measure author. The LatestOf and EarliestOf function can be used to apply both Latest/Earliest and NormalizeInterval. In order for measure developers to align with assessmentPerformed or procedurePerformed, the measure developers should utilize these expressions.

|  |  |  |
| --- | --- | --- |
| define function Latest(period Interval<DateTime>): | | |
|  | if (HasEnd(period)) then |
|  | end of period |
|  | Else |
|  | start of period |

|  |  |  |
| --- | --- | --- |
| define function Earliest(period Interval<DateTime>): | | |
|  | if (HasStart(period)) then |
|  | start of period |
|  | Else |
|  | end of period |

//Latest(NormalizeInterval(Procedure.relevantDateTime, Procedure.relevantPeriod))

|  |  |  |
| --- | --- | --- |
| define function LatestOf(pointInTime dateTime, period Interval<DateTime>): | | |
|  | Latest(NormalizeInterval(pointInTime, period)) |

|  |  |  |
| --- | --- | --- |
| define function EarliestOf(pointInTime dateTime, period Interval<DateTime>): | | |
|  | Earliest(NormalizeInterval(pointInTime, period)) |