

# Cooking with CQL Qs & As – Session 34

April 25, 2019 – 4:00-5:00 PM ET

## Date and Time Calculations

**Q:** CQL logic calculates an interval using both days and months. The specific line of code in question refers to: FirstIndexAssessment.authorDatetime where we can use a combination of months and days. For this line of code, are leap years accounted for if you use 14 months?

**A:** No, because months are still by calendar year too. If you had gone through February in 2012, you would have gotten 29 days. In order to avoid the issue with leap years, you should not combine months and days and only use days to avoid this variability.

**Q:** In the example of the QDM documentation illustrating the Cumulative Medication Duration calculation, if the second date is prior to the first date, does that always get to negative? Does this uncertainty play into that calculation?

**A:** Yes, if the second date is before the first date then you will get a negative number out of it. You will still get the same number, it would just be in the other direction.

**Q:** In the example of the QDM documentation illustrating the Cumulative Medication Duration calculation, what if the first date is only at the day level but the second level precision is at the time level, do you still end up with an indecision?

**A:** The engines do all the calculations so the lowest value of the less precise to the highest possible value of the less precise and they do the duration calculation between those and that gives them the result as an interval. In the example below, it would calculate from the earliest possible time, midnight, and the latest possible time, 11:59 PM, on the first date, giving you the same result. In general, it is okay for the format to be different between the 2 days. The actual result will be an uncertainty.

**Q:** For the interval function of the example of the QDM documentation illustrating the Cumulative Medication Duration calculation, is it required that the first parameter has to be less than or equal to the second parameter?

**A:** Yes, that is true of intervals. In the example below, that would be an error because it's not a valid interval.

```
49 Interval[@2018-02-01, @2018-01-01]
```

**Q:** Using the DifferenceInDays example below:

```
40 define DifferenceInDays: difference in days between @2017-01-01T22:00:00 and @2017-01-02T02:00:00 // 1
41 define DifferenceInDays: duration in days between @2017-01-01T22:00:00 and @2017-01-02T02:00:00 // 0
```

is this the same as calendar days? Would the DurationInDays give you the uncertainty result or would it be different in this situation?

**A:** The distinction between Difference and Duration is that Difference is counting the boundaries. You can still get uncertainty in Difference calculations but note that Difference is counting the number of boundaries crossed. In this example, DifferenceInDays is 1 because midnight was crossed once but DurationInDays is 0 because 24 hours have not passed. Note that both Difference and Duration calculations can give you uncertainty but Difference is less sensitive to the time than Duration.

## Queries in CQL

**Q:** How should we express the criteria that a Substance Use Disorder (SUD) encounter in the "identification period" (6 months before through the first 6 months of the measurement period) is considered new if there are no other SUD encounters in the 60 days prior to the encounter, and that for each new SUD encounter, there is a baseline Quality of Life (QOL) assessment in the 14 days on or before the new SUD encounter, and a corresponding follow up QOL using the same assessment tool within 3 to 6 months of the new SUD encounter, and having a SUD encounter within 60 days of the follow up QOL assessment?

**A:** For each SUD encounter, there should be a baseline QOL assessment 14 days on or before the new SUD encounter and a follow up QOL assessment using the same QOL tool within 3-6 months and that had a SUD encounter within 60 days before that follow up QOL assessment, which could take place on the same day as the SUD encounter. Please see the example below of how this query should be expressed.

```
30 define "Follow Up QOL Assessment":
31     from
32         "SUD Encounter During Identification Period with Patient Age at Start" NewSUDEncounter,
33         "QOL Assessment" BaselineAssessment,
34         "QOL Assessment" FollowupAssessment
35     where (BaselineAssessment.authorDatetime 14 days or less before or on start of NewSUDEncounter.relevantPeriod
36     or BaselineAssessment.authorDatetime during NewSUDEncounter.relevantPeriod)
37     and FollowupAssessment.authorDatetime 3 months or more after start of NewSUDEncounter.relevantPeriod
38         and FollowupAssessment.authorDatetime 6 months or less after start of NewSUDEncounter.relevantPeriod
39     and exists ("SUD Encounter" SUDEncounter where SUDEncounter.relevantPeriod starts 60 days or less before or on FollowupAs
40     and BaselineAssessment.code ~ FollowupAssessment.code
41     return FollowupAssessment
```