Centers for Medicare & Medicaid Services

Electronic Clinical Quality Measure (eCQM) Logic and Implementation Guidance

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1. Introduction

The Centers for Medicare & Medicaid Services (CMS) provides this guidance document for use with the updated hospital - inpatient, hospital - outpatient, and eligible clinician[1] electronic clinical quality measure (eCQM) specifications. CMS released the eCQM specifications in May 2025 for users and implementers of the eCQMs for calendar year 2026 reporting/performance under CMS's quality reporting and value-based purchasing programs. Please note, however, that the eCQM examples provided throughout this guidance document draw from the eCQM specifications posted for 2025 reporting/performance period.

eCQMs will not be eligible for 2026 reporting until CMS proposes and finalizes them through notice, public comment, and rulemaking for each applicable program. This document conceptualizes eCQM logic and data elements for Quality Data Model (QDM) measures and is intended for implementers. CMS strongly recommends review of this document to understand the intent and operation of each eCQM before implementation.

This document is organized as follows:

- Sections 2 through 4 provide general implementation guidance, including how to conceptualize and address specific logic and data elements during eCQM implementation.
- Section 5 provides information to interested parties on how to use the Assistant Secretary for Technology Policy/Office of the National Coordinator for Health Information Technology (ASTP/ONC) Project Tracking System (Jira) to provide feedback; track issues; ask questions about eCQM intent, specifications, certification, and standards; and address issues uncovered during implementation of the eCQMs.
- Section 6 provides contact information for the various eCQM-related CMS help desks.
- The appendices provide information on where to find the standards and code systems used in conjunction with the updated eCQMs as well as examples of timing intervals used in eCQM logic.

For additional information and guidance on implementing eCQM updates for 2026 reporting/performance, please refer to the eCQM Implementation Checklist and the tools, resources, and standards used by eCQMs provided on the Electronic Clinical Quality Improvement (eCQI) Resource Center.

[1] Please note that this guide formerly referred to "eligible clinician eCQMs" as "EC eCQMs."

1.1 eCQM Types

CMS classifies eCQMs based on the unit of analysis—patients or episodes—and the method used to compute the score, whether by proportion, continuous variable, ratio, or count. This section describes these classifications and provides details on computing eCQMs.

1.2 Population Basis

The Guidance section in the header of each eCQM includes a statement to indicate whether the eCQM is patient based or episode based. This section describes both the patient-based and episode-based eCQMs.

1.2.1 Patient-based eCQMs

Patient-based eCQMs evaluate the care of a patient and assign the patient to membership in one or more eCQM segments or populations. Most eligible clinician eCQMs are patient based.

All information in the patient record referenced in the eCQM should be considered when computing a patient-based measure. The criteria for inclusion of a patient in an eCQM population might require satisfying conditions across multiple patient encounters or episodes of care. For example, a patient can receive a diagnosis and initial treatment during one office visit and then have ongoing treatment associated with that same diagnosis during several follow-up visits or episodes of care.

To identify which patients the measured entity should count in a patient-based eCQM, review the Guidance section of the header and the context of the eCQM logic section. For example, in CMS124v13, Cervical Cancer Screening, patients included in the eCQM are females 24–64 years of age by the end of the measurement period with a visit during the measurement period, as defined in the eCQM's initial population (Figure 1.1).

Figure 1.1. Initial Population Example for a Patient-based eCQM

```
◢ Initial Population
    AgeInYearsAt(date from
      end of "Measurement Period"
    )in Interval[24, 64]
      and exists ( ["Patient Characteristic Sex": "Female"] )
      and exists "Qualifying Encounters"
```

1.2.2 Episode-based eCQMs

Episode-based eCQMs evaluate the care during an encounter with a measured entity and assign the episode of care to one or more eCQM population segments. All hospital - inpatient and hospital - outpatient eCQMs are episode-based eCQMs, and a few eligible clinician eCQMs are episode-based eCQMs.

In an episode-based eCQM, the initial population identifies the episodes of care. An episode is based on a specific event referenced in other segments of the eCQM, such as the denominator or the numerator.

To identify the encounters or procedures counted in an episode-based eCQM, review the Guidance section of the header and the context of the eCQM logic section. For example, for

CMS133v13, Cataracts: 20/40 or Better Visual Acuity within 90 Days Following Cataract Surgery, the unit of analysis is the cataract surgery procedure, as defined in the initial population (Figure 1.2).

Figure 1.2. Initial Population Example for an Episode-based eCQM

```
◢ Initial Population
    "Cataract Surgery Between January and September of Measurement Period" CataractSurgeryPerformed
        where AgeInYearsAt(date from start of "Measurement Period")>=18
```

In this example, the initial population includes all cataract surgery procedures performed between January and September of the measurement period in which the patient was 18 years of age or older at the start of the measurement period.

Please note that swing bed encounters should not be included in episode-based hospital - inpatient eCQMs. Therefore, implementers must work with their electronic health record (EHR) vendors to remove swing bed encounters from measures.

1.3 eCQM Scoring

1.3.1 Proportion eCQMs

Most of the eCQMs in current CMS reporting programs are proportion eCQMs. A proportion eCQM assigns the scored entities, either patients or episodes, to the populations and strata defined by an eCQM, and computes the appropriate rates.

The populations defined by a proportion measure include the following:[2]

- **Initial population (IP):** All events for measured entities to evaluate regarding a quality measure involving patients or episodes that share a common set of characteristics within a specific measurement set to which a given eCQM belongs. Subsequent eCQM populations (for example, numerator, denominator) draw patients or episodes from the initial population.
- **Denominator (DENOM):** The lower part of a fraction used to calculate a proportion or rate. It can be the same as the initial population or a subset of the initial population to further constrain the population for the purpose of the measure.
- **Denominator exclusions (DENEX):** A patient or episode that measured entities remove from the denominator before determining if numerator criteria are met. For example, a measure evaluating the existence of foot examinations for patients would list patients with bilateral lower extremity amputations as a denominator exclusion.
- **Numerator (NUMER):** The upper portion of a fraction used to calculate a proportion or rate. Also called the measure focus, it is the target process, condition, event, or outcome. Numerator criteria are the processes or outcomes of interest for each patient, procedure, or other unit of measurement defined in the denominator for proportion measures. A

[2] Most definitions are also available at the eCQI Resource Center Glossary. Note, these definitions are not eCQM-specific. For more information on how to calculate quality measures, please refer to the MMS Hub Measure Calculations guide, saved as a supplemental material on the MMS Resources and Templates page.

numerator statement describes the clinical action satisfying the conditions of the performance measure.

- **Denominator exceptions (DEXCEP):** Any condition that removes a unit of measurement (patients or episodes) from the denominator of the performance rate only if the patient or episode does not meet the numerator criteria. A denominator exception allows for adjustment of the calculated score for those measured entities with higher risk populations or for exercise of clinical judgment while performing care. Allowable reasons for a denominator exception fall into three general categories: (1) medical reasons, (2) patient reasons, or (3) system reasons. Only proportion measures use denominator exceptions. When removing denominator exception cases from the denominator, the measured entity may be required to report the number of patients or episodes with valid exceptions.
- **Numerator exclusions (NUMEX):** Defines an instance that measured entities should not include in the numerator data. Numerator exclusions are used only in ratio and proportion measures.

To compute a proportion measure:

- Identify the patients or episodes of care in the IP using the initial population criteria.
- Refine the IP by applying denominator criteria to identify the DENOM cases.
- Review DENOM cases against denominator exclusion criteria. If a case meets denominator exclusion criteria, label it as DENEX and remove it from consideration for the NUMER.
- Assess all remaining cases—all DENOM cases that do not meet denominator exclusion criteria—against the numerator criteria. Label all cases meeting the numerator requirements as NUMER.
- Identify cases that do not meet numerator requirements and assess them against denominator exception requirements. If a case meets denominator exception requirements, then label the case as DEXCEP.
- Identify cases meeting numerator requirements and evaluate them against the numerator exclusion requirements. If a case meets the numerator exclusions, then label the case as NUMEX.

1.3.1.1 Reporting Stratification

Proportion eCQMs might also have reporting strata defined for an eCQM. Strata are variables defining a subdivision of the eCQM for reporting, such as reporting separately by age group (for example, 14-19, 20-25). For eCQMs, the human-readable document includes a Stratification section. If an eCQM does not have reporting strata defined, it displays “None” as the default. If an eCQM contains reporting stratification data, the measure developer lists each stratum separately. For example, CMS159v13, Depression Remission at Twelve Months, contains two strata as stated in the header and noted in Figure 1.3.

Figure 1.3. Reporting Stratification

Stratification	Ages 12 to 17 at the time of the index assessment Ages 18 and older at the time of the index assessment

In addition, the strata are defined under the Population Criteria and Definition sections of the logic. For brevity, only one is shown below in Figure 1.4.

Figure 1.4. Stratification

```
exists ( ["Patient Characteristic Birthdate": "Birth date"] BirthDate
    with "Index Depression Assessment" IndexAssessment
      such that AgeInYearsAt(date from start of
Global."NormalizeInterval"(IndexAssessment.relevantDatetime, IndexAssessment.relevantPeriod)) in
Interval[12, 17]
)
```

1.3.1.2 Performance Rate Aggregation

Specific programs may require reporting of performance rates. The performance rate is the number of patients or episodes in the NUMER, accounting for NUMEX, divided by the number of patients or episodes in the DENOM, accounting for DENEX and DEXCEP. Calculate performance rate using the formula:

$$\text{Performance Rate} = (\text{NUMER} - \text{NUMEX}) / (\text{DENOM} - \text{DENEX} - \text{DEXCEP})$$

Some eCQMs have more than one population that are components of the overall calculation of a single performance rate. In this instance, the header specifies the performance rate calculation. Figure 1.5 provides an example of a defined rate aggregation for CMS145v13, Coronary Artery Disease (CAD): Beta-Blocker Therapy-Prior Myocardial Infarction (MI) or Left Ventricular Systolic Dysfunction (LVEF less than or equal to 40%).

Figure 1.5. Performance Rate Calculation Defined in Header for Multiple Populations

Rate Aggregation	This measure is intended to have one reporting rate, which aggregates the following populations into a single performance rate for reporting purposes: • Population 1: Patients with left ventricular systolic dysfunction (LVEF <=40%) • Population 2: Patients with a prior (within the past 3 years) myocardial infarction For the purposes of this measure, a single performance rate can be calculated as follows: Performance Rate = (Numerator 1 + Numerator 2)/ [(Denominator 1 – Denominator Exceptions 1) + (Denominator 2 – Denominator Exceptions 2)]

1.3.1.3 Multiple Numerators

For eCQMs with multiple numerators, the measured entity must score each patient or episode for inclusion or exclusion in each population. If an eCQM has more than one numerator and the first numerator includes the patient, the measured entity should evaluate the same patient for inclusion in additional numerators as well. Figure 1.6 provides an example of an eCQM, CMS128v13, Antidepressant Medication Management, with multiple numerators. If any patients in this eCQM meet the conditions for Numerator 1, the measured entity should also evaluate these patients to determine if they also meet the conditions for Numerator 2.

Figure 1.6. Multiple Numerators

Numerator	**Numerator 1:** Patients who have received antidepressant medication for at least 84 days (12 weeks) of continuous treatment beginning on the IPSD through 114 days after the IPSD (115 total days). **Numerator 2:** Patients who have received antidepressant medications for at least 180 days (6 months) of continuous treatment beginning on the IPSD through 231 days after the IPSD (232 total days).

When the eCQM definition includes stratification, the measured entity should report each population in the eCQM definition both without stratification and stratified by each stratification criterion.

1.3.2 Continuous Variable Measures

Continuous variable eCQMs can be patient-based or episode-of-care eCQMs. A continuous variable is a measure score in which each individual value for the measure can fall anywhere along a continuous scale. These measures include the following elements:[3]

- **Initial population (IP):** All events for measured entities to evaluate regarding a quality measure involving patients or episodes that share a common set of characteristics within a specific measurement set to which a given eCQM belongs. Subsequent eCQM populations (for example, measure population) draw patients or episodes from the initial population.
- **Measure population (MSRPOPL):** The measure population defines the criteria that patients or episodes must meet to be included in the measure calculation. It can be identical to, or a subset of, the initial population—for example, all patients seen in the emergency department during the measurement period.
- **Measure population exclusions (MSRPOPLEX):** A subset of the measure population that the measure observation calculations do not use.
- **Measure observations:** The computation that measured entities should perform on the members of the measure population after removing the measure population exclusions. For example, CMS986v4, Global Malnutrition Composite Score, assesses the percentage of hospitalizations of adults aged 65 years and older at the start of the inpatient encounter during the measurement period, with a length of stay equal to or greater than 24 hours, who received optimal malnutrition care where care performed was appropriate to the patient's level of malnutrition risk and severity.

To compute a continuous variable eCQM, take the following steps:

- Identify the patients or episodes of care in the IP using the initial population criteria.
- Refine the IP by applying measure population criteria to identify the MSRPOPL cases.

[3] Most definitions are also available at the eCQI Resource Center Glossary. Note, these definitions are not eCQM specific. For more information on how to calculate quality measures, please refer to the MMS Hub Measure Calculations guide, saved as a supplemental material on the MMS Resources and Templates page.

- Review MSRPOPL cases against measure population exclusion criteria. If a case meets measure population exclusion criteria, label it as a MSRPOPLEX and remove it from consideration for the measure observations.
- Evaluate each remaining member of the MSRPOPL against the defined measure observation criteria and aggregate the results using the specified operator.

As with proportion eCQMs, continuous variable eCQMs might have stratification requirements. Report performance results for each population without stratification and for each defined stratum separately. The initial population and measure population require specifying the number of patients or episodes falling into each of these populations without stratification as well as those populations stratified by any defined strata.

1.3.3 Ratio Measures

Ratio measures can be either patient-based or episode-of-care measures. They include the following elements:

- **Initial population (IP):** All events for measured entities to evaluate regarding a quality measure involving patients or episodes that share a common set of characteristics within a specific measurement set to which a given eCQM belongs. Subsequent eCQM populations (for example, numerator, denominator) draw patients or episodes from the initial population(s). Note that there may be different initial populations for the denominator and numerator of ratio measures.
- **Denominator (DENOM):** The lower part of a fraction used to calculate a ratio. It can be the same as the initial population or a subset of the initial population to further constrain the population for the purpose of the measure.
- **Denominator exclusions (DENEX):** A patient or episode that measured entities remove from the denominator. In ratio measures, because the denominator and numerator flow separately from the initial population, patients who meet the denominator exclusions criteria are only removed from the denominator, not the numerator.
- **Numerator (NUMER):** The upper portion of a fraction used to calculate a ratio. Also called the measure focus, it is the target process, condition, event, or outcome. Numerator criteria are the processes or outcomes of interest for each patient, procedure, or other unit of measurement defined in the initial population for ratio measures. A numerator statement describes the clinical data element satisfying the conditions of the performance measure. The numerator is not a subset of the denominator for ratio measures.
- **Numerator exclusions (NUMEX):** Defines an instance that measured entities should not include in the numerator data. Numerator exclusions are used only in ratio and proportion measures.
- **Measure observations:** The computation that measured entities should perform on the cases of the numerator and denominator after removing the exclusions. For example, Measure Observation 1, associated with the denominator of the ratio eCQM CMS871v4, Hospital Harm - Severe Hyperglycemia, computes the number of inpatient hospital days that match the initial population/denominator criteria and do not meet denominator exclusion criteria. Measure observations may be associated with the denominator or numerator.

The following steps are used to compute a ratio measure denominator:

1. Identify the patients or episodes of care in the IP using the initial population criteria.
2. Refine the IP by applying denominator criteria to identify the DENOM cases. The DENOM may equal the IP.
3. Review DENOM cases against denominator exclusion criteria. If a case meets denominator exclusion criteria, label it as a DENEX and remove it from the DENOM.
4. Evaluate each remaining member of the DENOM (for example, all cases that meet the DENOM and *not* DENEX*)* against the defined measure observations criteria and aggregate the results using the specified operator.

The following steps are used to compute a ratio measure numerator:

1. Identify the patients or episodes of care in the IP using the initial population criteria.
2. Refine the IP by applying numerator criteria to identify the NUMER cases.
3. Review NUMER cases against numerator exclusion criteria. If a case meets numerator exclusion criteria, label it as a NUMEX and remove it from the NUMER.
4. Evaluate each remaining member of the NUMER (for example, all cases that meet the NUMER and *not* NUMEX*)* against the defined measure observations criteria and aggregate the results using the specified operator.

Aggregate scores for ratio measures can be more than just the counts of cases in each population. In addition to the identification of measure population(s), ratio measures can define observations on cases falling into various populations and then aggregate these individual observations according to aggregation rules specific to each measure.

In ratio measures, for each population, the measure developer should use individual observations (for example, measurements or calculations) for denominator and numerator cases, and then use them to calculate the aggregate ratio:

Ratio: Aggregate NUMER / Aggregate DENOM

Calculate the aggregate DENOM using individual observations for all cases in the DENOM and not in the DENEX and calculate the aggregate NUMER using individual observations for all cases in the NUMER and not in the NUMEX. For more detailed examples of ratio measure calculations, please reference the MMS Hub Measure Calculations guide, saved as a supplemental material on the MMS Resources and Templates page.

Unlike proportion and continuous variable measures, ratio measures cannot apply stratification requirements unless the numerator and denominator are pulled from the same initial population.

1.4 Hybrid Measures

Hybrid measures are quality measures merging data elements from two or more sources to calculate measure results (for example, EHR and claims data). These measures require updates to both the electronic specifications and claims-based specifications, available on QualityNet. For more information on hybrid measures, please see the hybrid measures subsection of the eCQI Resource Center.

1.5 Program Candidate eCQMs

Program candidate eCQMs are not eligible for CMS quality reporting until CMS proposes and finalizes them through notice-and-comment rulemaking for each applicable program. Program candidate measures can be found on the eCQI Resource Center website in designated Hospital - Inpatient, Hospital - Outpatient, and Eligible Clinician subsections by filtering on the reporting/performance period and "Program Candidate eCQMs."

2. Clinical Quality Language Measure Logic

eCQMs use Clinical Quality Language (CQL) logic and the QDM to harmonize standards between clinical decision support and eCQM reporting. CQL is a clinically focused, high-level query language that can express sophisticated eCQM logic. A significant feature of CQL is its use of libraries, which are collections of CQL definitions or function statements that eCQM and clinical decision support artifact developers can share across and between eCQMs and decision support rules. The use of shared functions and definitions results in greater consistency across eCQMs and enables developers to reuse the same statements.

Several Health Level Seven International (HL7®) implementation guides (IGs) and related resources provide direction on using CQL expressions and QDM data elements in the eCQM via the Health Quality Measures Format (HQMF). The following resources are primary sources for interpreting eCQM representation:

- HL7 Version 3 Implementation Guide: Clinical Quality Language (CQL)-based Health Quality Measure Format (HQMF), Release 1, Standard for Trial Use 4.1—US Realm
- Clinical Quality Language Specification, Release 1 Mixed Normative/Trial-Use (CQL 1.5)
- CQL Formatting and Usage Wiki
- QDM v5.6

Subsections 2.1 through 2.6 provide an overview of this material, including common logic expressions and proper usage.

Visit the CQL page on the eCQI Resource Center for additional information and education.

2.1 Using CQL Logic to Evaluate QDM Elements

A QDM eCQM consists of populations, such as denominator or numerator, that are composed of a combination of QDM data elements and CQL logic to form expressions. These expressions define the criteria for membership in each population based on the intent of the eCQM.

As shown in Figure 2.1, this definition statement establishes the global criteria for an inpatient encounter.

Figure 2.1. Sample Definition Statement

```
◢ Global.Inpatient Encounter
    ["Encounter, Performed": "Encounter Inpatient"] EncounterInpatient
      where EncounterInpatient.relevantPeriod ends during day of "Measurement Period"
```

The first part of this definition statement, enclosed in brackets, references a QDM datatype ("Encounter, Performed") and a value set indicating the specific codes meeting encounter criteria for this eCQM ("Encounter Inpatient"). The combination of a QDM datatype and a value set defines a QDM data element, which describes clinical information. The QDM datatype, such as "Encounter, Performed;" "Procedure, Performed;" or "Medication, Order," provides context for the higher-level clinical concept, or QDM category, of clinical information being referenced, such as encounter, procedure, or medication. Additional data, or attributes, may be necessary to

meet the needs of the eCQM. QDM specifies a set of attributes allowable for each QDM datatype. For example, *dosage* and *supply* are attributes available for "Medication, Order." All QDM datatypes include a *code* attribute with a value set or direct reference code. The logic statements do not explicitly call out the code attribute but invoke it when filtering against the value set. For detailed descriptions of the QDM data model, including all QDM datatypes and related attributes, please refer to QDM v5.6.

This CQL expression also describes the timing elements to determine whether the end of the specified encounter occurred during the measurement period. By referencing this entire expression as a CQL definition, in this case called "Inpatient Encounter," the eCQM can refer to that definition without repeating all the details.

The CQL Formatting and Usage Wiki contains additional information regarding the use of CQL and QDM in Authoring Measures in CQL. Sections 2.2 through 2.5 provide a summary of that content, focusing on interpreting measures written in CQL.

2.2 Understanding CQL Basics

CQL is a high-level query language that serves to write expressions that determine *what* data to return rather than *how* to return them. How to return the data is part of the implementation of an eCQM, and the measured entity can accomplish it in various ways (for example, by queries in a database system or map-reduce processing on an Apache Hadoop® [software utility] cluster). CQL is intentionally silent on many of those details, enabling implementer use of the logic expressed by CQL queries in a broad variety of implementation environments to achieve the same result.

Several basic elements make up CQL expressions:

- Values: Within CQL, the term value refers to a piece of data of some type.
  - Examples: The number `5`, or the quantity `5 'mm[Hg]'`
- Operators: An entity used to perform operations.
  - Examples: `"+"`, `"-"`, `"and"`, `"or"`, `"intersect"`, and `"union"`
- Functions: Prebuilt actions that perform calculations, manipulate data, and return results.
  - Examples: `CalculateAge()` and `First()`
- Identifiers: The names given by a database designer or a system user to database objects.
  - Examples: `"Inpatient Encounter"`

Measure specification logic can combine these basic elements to express criteria and then label them with identifiers so they can either define additional criteria or define a top-level population.

When the members of an eCQM population are patients, measure developers express the criteria as a yes or no test to determine whether the patient is in or out of that population segment. As shown in Figure 2.2, the definition of "Initial Population" for CMS2v14, Preventive Care and Screening: Screening for Depression and Follow-Up Plan is:

Figure 2.2. Example with Boolean Return

```
◢ Initial Population
    "Patient Age 12 Years or Older at Start of Measurement Period"
      and exists ( "Qualifying Encounter During Measurement Period" )
```

For this example, the initial population includes patients whose birthdate indicates they were 12 years of age or older at the start of the measurement period, and the patient has a qualifying encounter.

In patient-based eCQMs, measure developers define each population, such as the initial population, denominator, or numerator, by criteria resulting in a Boolean—yes or no—return; however, there could be other definitions in the eCQM that return lists. "`Qualifying Encounter During Measurement Period`" is one such definition, which returns a list of encounter data. In Figure 2.3, the relevant period indicates the start and end times for the qualifying encounter.

Figure 2.3. Example with List Return

```
◢ Qualifying Encounter During Measurement Period
    ( ["Encounter, Performed": "Encounter to Screen for Depression"]
      union ["Encounter, Performed": "Physical Therapy Evaluation"]
      union ["Encounter, Performed": "Telephone Visits] ) QualifyingEncounter
      where QualifyingEncounter.relevantPeriod during day of "Measurement Period"
```

2.3 Libraries

CQL libraries are collections of CQL expression definitions, functions, and other declarations. Each eCQM contains a primary CQL library defining the criteria used by the populations of the eCQM. The HQMF document references the CQL library, which contains expressions defining measure populations.

Libraries can contain the following:

- Expression definitions, such as "`Inpatient Encounter`"
- Terminologies, such as references to code systems, value sets, direct reference codes, codable concepts, and codes
- Functions, such as "`NormalizeInterval`"

Once an eCQM includes a reference to a library, the eCQM can subsequently reference components of that library throughout the eCQM. In Figure 2.4, the definition for one of the denominator exclusions in CMS108v13, Venous Thromboembolism Prophylaxis, is `Encounter Less Than 2 Days`.

Figure 2.4. Use of Libraries in Definitions

```
◢ Encounter Less Than 2 Days
    VTE."Encounter with Age Range and without VTE Diagnosis or Obstetrical Conditions" QualifyingEncounter
      where Global."LengthInDays" ( QualifyingEncounter.relevantPeriod ) < 2
```

This example defines inpatient hospitalizations with a qualifying encounter when the length of stay is less than two days, referring in the logic to the `Global."LengthInDays"` function. The `Global` in this definition refers to a library used by many of the eCQMs that share definitions and functions such as `LengthinDays`. eCQMs can use definitions and functions contained in the Venous Thromboembolism (VTE) library related to VTE encounters and diagnoses, including the `VTE."Encounter with Age Range and without VTE Diagnosis or Obstetrical Conditions"` definition used in this example.

For more information on libraries, refer to the Using Libraries to Share Logic section (Chapter 2—Author's Guide) of the CQL specification.

2.4 Queries

A central construct in CQL is the query, a specific type of expression enabling easy and precise expression of relationships between data. Queries in CQL are clause based, which means they use different types of clauses depending on what operations the logic performs on the data.

The general structure of a CQL query:

<source> <alias>

<with or without clauses>

<where clause>

<return clause>

<sort clause>

Because all the clauses are optional, the simplest query is just a source and an alias:

```
"Outpatient Encounters" Encounter
```

Here, the source is a reference to `"Outpatient Encounters,"` which is an expression returning a list of encounters. `Encounter` is the alias. The alias allows reference to the elements of the source anywhere within the query. Because this simple query does not have any clauses, it simply returns the same result as the source.

2.4.1 Where Clause

The `where` keyword introduces a `where` clause, which enables the user to filter the results of the source, as shown in Figure 2.5 from CMS124v13, Cervical Cancer Screening.

Figure 2.5. Where Clause

◢ Qualifying Encounters

```
( ["Encounter, Performed": "Office Visit"]
      union ["Encounter, Performed": "Preventive Care Services Established Office Visit, 18 and Up"]
      union ["Encounter, Performed": "Preventive Care Services Initial Office Visit, 18 and Up"]
      union ["Encounter, Performed": "Home Healthcare Services"]
      union ["Encounter, Performed": "Telephone Visits"]
      union ["Encounter, Performed": "Virtual Encounter"] ) ValidEncounters
      where ValidEncounters.relevantPeriod during day of "Measurement Period"
```

This query returns only those encounters from the source whose `relevantPeriod` is during the `Measurement Period`. The `where` clause enables measure developers to specify any condition in terms of the aliases introduced in the query, such as `ValidEncounters` in this case. Every encounter performed in the `union` query source evaluates the condition in the `where` clause, and the result then includes only those encounters for which the condition evaluates to true.

2.4.2 Relationships – With and Without Clauses

Describing relationships between data is so common in quality measurement that CQL provides special constructs to make expressing these relationships simple by using `with` and `without` keywords. The `with` keyword can serve to describe cases that measured entities should consider only if a related data item is present. The example query, as shown in Figure 2.6 from CMS146v13, Appropriate Testing for Pharyngitis, limits the emergency department (ED) or ambulatory encounters to return only those starting three days or less on or before the day that the measured entity ordered the antibiotic. The `such that` clause describes the condition of the relationship, which is expressed in terms of the aliases `EDOrAmbulatoryVisit` for the main source of the query and `AntibioticOrdered`.

Figure 2.6. With Clause Example

◢ Encounter With Antibiotic Ordered Within Three Days

```
"Qualifying Encounter" EDOrAmbulatoryVisit
   with ["Medication, Order": "Antibiotic Medications for Pharyngitis"] AntibioticOrdered
                such that ( start of EDOrAmbulatoryVisit.relevantPeriod ) 3 days or less on or before day of
AntibioticOrdered.authorDateTime
```

The `without` keyword can serve to describe cases that measured entities should consider only if a particular data item is *not* present. As shown in Figure 2.7, the numerator definition in CMS154v13, Appropriate Treatment for Upper Respiratory Infection (URI) is:

Figure 2.7. Without Clause Example

◢ Numerator

```
"Encounter with Upper Respiratory Infection" EncounterWithURI
  without ["Medication, Order": "Antibiotic Medications for Upper Respiratory Infection"] OrderedAntibiotic
    such that OrderedAntibiotic.authorDatetime 3 days or less on or after start of
EncounterWithURI.relevantPeriod
  return EncounterWithURI
```

This query limits the encounters returned to only those that did *not* have a medication order for an antibiotic medication for upper respiratory infection. Similar to the `with` clause, the `without` clause uses `such that` to describe the condition of the relationship.

2.5 Timing Calculations

Assessing the relative timing of events within a patient's electronic medical record is an essential part of computing eCQMs. To enable the unambiguous interpretation of the eCQMs, it is necessary to clearly define computation of time intervals. A simple expression such as "the treatment must occur within 3 days of the diagnosis" has many possible interpretations, including

that the treatment must occur within 72 hours of the diagnosis or that the treatment must happen within 3 business days of the diagnosis.

The International Organization for Standardization 8601:2004 defines data elements and interchange formats for the representation of dates and times, including time intervals. A full list of definitions related to timing is part of the Clinical Quality Language Specification, Release 1 Mixed Normative/Trial-Use (CQL 1.5).

To determine the length of time between two dates, CQL provides two approaches: duration, the number of whole periods between two dates, and difference, the number of period boundaries crossed between two dates. The expression of each period represents a time unit, such as hours, days, or months. These approaches provide options to correctly express timing relationships for implementation of measures. For example, in hospital - inpatient and hospital - outpatient eCQMs, the recommended timing pattern for initial population criteria is an encounter that "ends during day of "Measurement Period.'" The use of 'ends' provides a single point of time comparison within the measurement period so the receiving systems can provide reports on a quarterly basis, while 'day of' specifies day precision to avoid time zone offset and millisecond issues. In contrast, dateTime precision would result in applying a time zone offset adjustment, for example.

Appendix B of this document includes more information on time intervals and examples, as does Appendix H of the CQL specification.

2.5.1 Duration

CQL provides specificity when calculating duration. Conceptually, the calculation is performed considering two dates on a timeline and counting the number of whole periods (for example, years, days, hours) fitting on the timeline between the two dates. CQL considers this calculation to be as fine grained as necessary to meet this intent of the measure. Only the available data limits the precision of the calculation.

2.5.2 Difference

Difference calculations are achieved by truncating the date or time values at the next level of precision and then performing the corresponding duration calculation on the truncated values.

To illustrate the difference:

Date 1: 2021-12-31

Date 2: 2022-01-01

Duration In Years: Years between Date 1 and Date 2 = 0

Difference In Years: Difference in Years between Date 1 and Date 2 = 1

The Duration In Years expression returns zero because a full year has not passed between the two dates, but the Difference In Years expression returns 1 because the one-year boundary was crossed between the two truncated dates—2021 and 2022. Please note that the difference boundary at day precision (that is, date) is midnight.

2.5.3 Intervals

CQL supports intervals of numbers and date or time values using a standard mathematical notation to indicate open and closed. Brackets indicate a closed endpoint, and parentheses indicate an open endpoint. An open interval boundary excludes the endpoint and a closed interval boundary includes it. For example, `Interval[5, 10)` includes the point 5 but excludes the point 10.

Intervals use a set of comparison operators such as `A during B`, `A overlaps B`, or `A includes B`. Precise relationships between intervals use natural language timing phrases such as `A starts before start B` or `A starts 1 day or less after end B`.

The unit expressing a time interval or its duration could depend on the necessary level of accuracy for the purposes of measurement. Measure developers select the time unit to use according to the level of granularity required to meet the intent of the measure.

3. Data Elements and Value Sets

eCQMs build data elements from the datatypes and attributes in the QDM. Additional reference material can be found at QDM - Quality Data Model section of the eCQI Resource Center.

3.1 eCQM Data Element Repository

The eCQM Data Element Repository (DERep) provides additional clarification for all data elements associated with published and tested eCQMs used in CMS quality reporting programs, along with the definitions and clinical focus for each data element. An end user can filter information by data element, eCQM, QDM attribute, QDM category, QDM datatype, or QDM entities.

3.2 Value Set Location and Tools

Value sets are lists of unique coded identifiers with names, called descriptors, for groupings of clinical and administrative concepts selected from standard code systems. They serve to define a set of concepts (for example, diabetes or clinical visit), identifying selected populations and satisfying measure criteria in eCQMs. Value sets can be found at the Value Set Authority Center (VSAC), which is maintained by the National Library of Medicine (NLM) in collaboration with CMS. The VSAC provides downloadable access to all official versions of value set content contained in the eCQM specifications. The value sets used in eCQMs and available in the VSAC can either directly contain code system members or reference other value sets, as in a grouping value set. The VSAC also provides value set authoring capabilities for registered value set authors and updates value set content based on each new version of the underlying code systems, such as Current Procedural Terminology (CPT), International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM), Systematized Nomenclature of Medicine–Clinical Terms (SNOMED CT), or Logical Observation Identifiers Names and Codes (LOINC) used in value sets.

The NLM has an application programming interface (API) to the VSAC content in addition to a web interface. The API documentation is available on the VSAC on the VSAC API Resources page.

The VSAC also links to downloadable value set content used in current and previous eCQM release sets. These downloads are in both Excel and sharing value sets-compliant Extensible Markup Language (XML) for all hospital - inpatient, hospital - outpatient, and eligible clinician value sets.

The downloadable files include a column indicating the QDM category represented by each value set. For value sets used exclusively to express QDM attributes, the QDM category column is blank because more than one QDM category may use an attribute.

The value set spreadsheets do not include the direct reference codes used in eCQMs. To obtain a separate listing of those codes, users must select the "Direct Reference Codes Specified within eCQM HQMF files Published *Month DD, YYYY*."

The VSAC provides three additional resources:

- The binding parameter specification documents the information used to create the value set expansions made available for an annual release or addendum. The binding parameter specification contains the code system version, the value set definition version, and the expansion profile information used to create each of the value set expansions included in the annual release, sorted by measure and QDM datatype.
- A list of retired and legacy codes in eCQM value sets published in a value set release.
- A list of the code system versions used in eCQM value sets published in a value set release.

Access to value set details in VSAC requires a free Unified Medical Language System® Metathesaurus License. Any use of value sets must be consistent with the licensing requirements and copyright protections covered by this license.

3.3 Direct Reference Codes

A direct reference code specifies QDM data elements in measure logic rather than creating single-code value sets. The use of direct reference codes prevents using an alternative identifier for a code system concept and eliminates additional implementation work to unpack the value set. These codes display directly within the measure logic and in the Terminology section of the HQMF. Some value sets containing only one code, however, are appropriate in the following circumstances:

- When authoring a value set, only one code exists but there is a reasonable expectation the measure developer may consider additional codes added to the terminology to represent the intent of the value set.
- A value set initially contained multiple codes, but all except one was retired by the code system or systems. Because the measure might have to allow look-back, the value set remains valid with only one active code.

As shown in Figures 3.1 and 3.2, direct reference codes are found in CMS124v13, Cervical Cancer Screening, in which individual codes within the CQL logic reference discharge to home for hospice care, discharge to healthcare facility for hospice care, hospice care assessment, and a yes response to an assessment. The measure's Terminology section lists each of these codes.

Figure 3.1. Direct Reference Codes

```
◢ Hospice.Has Hospice Services
    exists ( ["Encounter, Performed": "Encounter Inpatient"] InpatientEncounter
       where ( InpatientEncounter.dischargeDisposition ~ "Discharge to home for hospice care
(procedure)"
          or InpatientEncounter.dischargeDisposition ~ "Discharge to healthcare facility for hospice care
(procedure)"
       )
        and InpatientEncounter.relevantPeriod ends during day of "Measurement Period"
    )
     or exists ( ["Encounter, Performed": "Hospice Encounter"] HospiceEncounter
        where HospiceEncounter.relevantPeriod overlaps day of "Measurement Period"
     )
     or exists ( ["Assessment, Performed": "Hospice care [Minimum Data Set]"] HospiceAssessment
        where HospiceAssessment.result ~ "Yes (qualifier value)"
          and Global."NormalizeInterval" ( HospiceAssessment.relevantDatetime,
HospiceAssessment.relevantPeriod ) overlaps day of "Measurement Period"
     )
     or exists ( ["Intervention, Order": "Hospice Care Ambulatory"] HospiceOrder
        where HospiceOrder.authorDatetime during day of "Measurement Period"
     )
     or exists ( ["Intervention, Performed": "Hospice Care Ambulatory"] HospicePerformed
        where Global."NormalizeInterval" ( HospicePerformed.relevantDatetime,
HospicePerformed.relevantPeriod ) overlaps day of "Measurement Period"
     )
    or exists ( ["Diagnosis": "Hospice Diagnosis"] HospiceCareDiagnosis
        where HospiceCareDiagnosis.prevalencePeriod overlaps day of "Measurement Period"
     )
```

Figure 3.2. Terminology Aligned with Direct Reference Codes from Figure 3.1

Terminology

- code "Discharge to healthcare facility for hospice care (procedure)" ("SNOMEDCT Code (428371000124100)")
- code "Discharge to home for hospice care (procedure)" ("SNOMEDCT Code (428361000124107)")
- code "Functional Assessment of Chronic Illness Therapy — Palliative Care Questionnaire (FACIT-Pal)" ("LOINC Code (71007-9)")
- code "Hospice care [Minimum Data Set]" ("LOINC Code (45755-6)")
- code "Yes (qualifier value)" ("SNOMEDCT Code (373066001)")

3.4 QDM Category and Code System

CMS's Measures Management System (MMS) Hub published a recommended vocabularies document with the ONC-Health Information Technology Standards Committee with recommended code systems for each QDM category.[4] Measure developers link data elements to a value set, grouping value set, or a direct reference code, complying with these recommendations when authoring measures. Downloadable resources of value sets by QDM datatype are also available on the VSAC on the Download tab.

Some measures combine different options, or definitions, to express instances of a single QDM datatype within the logic. As shown in Figure 3.3, qualifying encounters exist in the initial population for CMS131v13, Diabetes: Eye Exam.

[4] The committee made these recommendations in 2012 and 2015 using program information and language current at the time, and the recommendations are consistent with the Interoperability Standards Advisory.

Figure 3.3. Definition Using Multiple Data Elements to Address Terminology Requirements

```
◢ Qualifying Encounters
    ( ["Encounter, Performed": "Office Visit"]
      union ["Encounter, Performed": "Annual Wellness Visit"]
      union ["Encounter, Performed": "Preventive Care Services Established Office Visit, 18 and Up"]
      union ["Encounter, Performed": "Preventive Care Serviced Initial Office Visit, 18 and Up"]
      union ["Encounter, Performed": "Home Healthcare Services"]
      union ["Encounter, Performed": "Ophthalmological Services"]
      union ["Encounter, Performed": "Telephone Visits"] ) ValidEncounters
      where ValidEncounters.relevantPeriod during day of "Measurement Period"
```

In this example, the seven encounters all use the same QDM datatype (`Encounter, Performed`), and each binds a grouping value set using a single code system and the logic (`union`) to express these encounter types meet the measure criteria. Together, these seven encounters provide codes covering the recommended code system, SNOMED CT, as well as the native capture terminologies (formerly referred to as 'transition code systems'), CPT and Healthcare Common Procedure Coding System (HCPCS).

CMS encourages users of the eCQMs updated for 2026 reporting or performance to suggest additions and deletions to data elements, both within value sets and between code systems. Users can submit their suggestions via the ASTP/ONC Project Tracking System (Jira) QDM Issue Tracker.

3.5 Drug Representations Used in Value Sets

Value sets referring to specific non-vaccine, prescribable medications use generalized drug concepts, such as RxNorm Semantic Clinical Drugs [SCDs]. Health information technology (IT) vendors or measured entities report the drug entities in patient data using the generalized drug concepts included in the defined value sets. These concur with CMS's guidance regarding the preferred use of generalized drug concepts. eCQM implementers should use the relationships found in RxNorm to support mapping between specific drug entities found in patient records to those found in the provided value sets. If mapping is conducted, implementers should maintain documentation in case of a CMS audit. Administered vaccines are currently represented in value sets using Clinical Vaccine Formulation (CVX) codes.

3.6 Discharge Medications

The use of "`Medication, Discharge`" has a very specific meaning in hospital – inpatient eCQMs. This designation refers to medications reconciled in the clinical environment and documented on the patient's discharge medication list. "`Medication, Discharge`" **events are not equivalent to medications that happen to be active at the time of discharge.** Discharge medications represent those medications the patient should be taking in the next setting of care, generally used for discharges to home. These discharge medications will be the same as the subsequent home medication list resulting from medication reconciliation in the ambulatory patient medical record. This reconciled medication list is very likely to be different from the ambulatory medication list existing before admission to the hospital since the discharge medication list will account for new clinical considerations identified during the hospitalization.

Figure 3.4 is an example of measure logic for "`Medication, Discharge`" in CMS104v13, Discharged on Antithrombotic Therapy, in which the numerator logic contains

["Medication, Discharge": "Antithrombotic Therapy for Ischemic Stroke"] and refers to the presence of an antithrombotic therapy on the discharge medication list of the ischemic stroke encounter.

Figure 3.4. Discharge Medication Example

Numerator

TJC."Ischemic Stroke Encounter" IschemicStrokeEncounter
with ["Medication, Discharge": "Antithrombotic Therapy for Ischemic Stroke"] DischargeAntithrombotic
such that DischargeAntithrombotic.authorDatetime during IschemicStrokeEncounter.relevantPeriod

Health IT vendors and measured entities generating Quality Reporting Document Architecture (QRDA) Category I output will have to generate "Medication, Discharge" events for all medications on the discharge list with appropriate time stamps to enable the correct function of measure logic.

3.7 Allergies to Medications and Other Substances

Allergy value sets referenced in eCQMs contain appropriate codes from RxNorm aligned with ingredient-level concepts. Users can use RxNorm relationships to link ingredients to the specific drug entities that could occur in patients' records. eCQMs generally express reactions that may occur, such as rash or wheezing, using appropriate SNOMED CT codes representing the condition.

This means that value sets used by eCQMs to identify medication allergens for the QDM datatype "Allergy/Intolerance" use RxNorm ingredient-type concepts. These concepts only identify the ingredient and not the form or strength, and they have the RxNorm term type consistent with ingredient-level identifiers. If the EHR does not record patient allergy and intolerance data using an RxNorm ingredient-type concept, measured entities will have to use RxNorm relationships to identify the correct ingredient concept for the drug concept used in the EHR.

eCQM developers can add SNOMED CT drug class concepts to represent medication allergens. If a drug class concept is appropriate for use in the measure, the following should apply:

- eCQM specifications will only include SNOMED CT drug class concepts when a general drug class concept is expected to be found in patient records as an indication that the patient is considered allergic to all drugs in the class.
- Implementers should keep in mind that when using a drug class concept to represent a measure exclusion or exception, the patient should receive no drug in the class for expected therapy.
- eCQM specifications will include review of all defined drugs in the class when choosing to include the SNOMED CT drug class concept and will define an RxNorm allergy value set with the specific ingredient (IN) and precise ingredient (PIN) term types drug ingredients representing the drug class.
- Some value sets group both the RxNorm ingredient-type allergy value set and the SNOMED CT drug class allergy value set into one grouping value set referenced by the eCQM.

- Value sets used to identify nonmedication allergy-inducing entities use concepts found in the SNOMED CT substance semantic types.

3.8 Principal Diagnosis in Inpatient Encounters

In EHRs, the principal diagnosis is defined as the condition established to be chiefly responsible for the admission of a patient to the hospital for care according to the Uniform Hospital Discharge Data Set definition.

QDM v5.6 adds the attribute *rank* with an integer value. A principal diagnosis is the encounter-related billing diagnosis with a *rank* of 1. For example, CMS108v13: Venous Thromboembolism Prophylaxis, is depicted in Figure 3.5.

Figure 3.5. Principal Diagnosis Example

```
Encounter With Principal Diagnosis of Mental Disorder or Stroke
    VTE."Encounter With Age Range and Without VTE Diagnosis or Obstetrical Conditions" Qualifying Encounter
      where exists ( QualifyingEncounter.diagnoses EncounterDiagnoses
        where EncounterDiagnoses.rank = 1
          and ( EncounterDiagnoses.code in "Mental Health Diagnoses"
              or EncounterDiagnoses.code in "Hemorrhagic Stroke"
              or EncounterDiagnoses.code in "Ischemic Stroke"
          )
      )
```

eCQM requests for all encounter-related diagnoses, regardless of rank, use the encounter attribute `diagnosis`. Note that, by definition, a principal diagnosis must be present at the time of the initiation of the encounter. The attribute `diagnosis` does not specify the exact timing relationship. Therefore, to express the timing relationship of a specific diagnosis with an encounter, the eCQM must use the QDM datatype `"Diagnosis"` to associate with the `"Encounter, Performed"`, that is, onset at the start or end of the episode of care. The admission or discharge diagnoses recorded by the measured entity should not substitute for the principal diagnosis unless it is concordant with the principal diagnosis as defined by CMS.

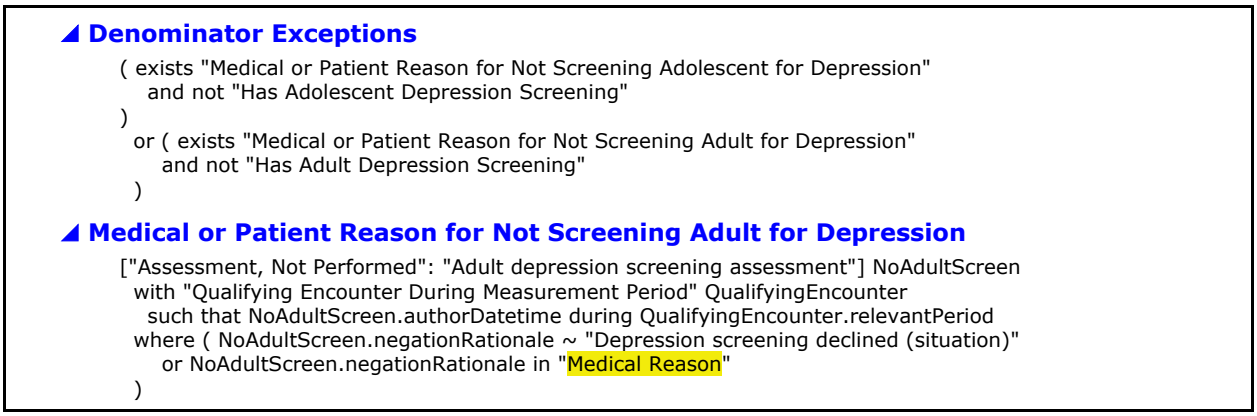
3.9 Medical Reason, Patient Reason, System Reason

Capturing evidence in EHRs of an intentional decision to refrain from performing an activity and the rationale can be challenging. Some eCQMs seek to retrieve evidence using the QDM attribute, *negationRationale*. eCQMs use value sets to specify medical reason, patient reason, and/or system reason why a particular performance activity did not happen. For example, a medical reason for exception may include a rare but relevant comorbidity that could not be anticipated by the measure developer to create an explicit exclusion based on the condition. A patient reason for exception from denominator criteria may include religious preference.

If a patient or episode meets a measure's denominator exception criteria, the measured entity must translate the specific reason for the exception to a code from the value set or the direct reference code that is used to specify the measure's denominator exception criteria. The measured entity should retain supporting documentation of the specific reason that the patient or episode met the denominator exception criteria, as CMS may expect the measured entity to demonstrate relevant justification if audited.

For example, CMS2v14: Preventive Care and Screening: Screening for Depression and Follow-Up Plan excepts patients from the denominator who are not screened for depression based on a medical reason, as depicted in Figure 3.6.

Figure 3.6. Denominator Exception Example



If a patient met this measure's denominator exception criteria of not being screened for depression based on a medical reason, the measured entity would need to only report a code from the "Medical Reason" (OID: 2.16.840.1.113883.3.526.3.1007) value set, such as "Procedure not indicated (situation)." The measured entity should confirm, however, that there is a legitimate medical reason for exception and should document specific information on the medical reason in case of a CMS audit.

3.10 Activities That Were "Not Done"

Measure developers may use a negation attribute to identify situations in which an expected action did not occur (for example, the measured entity did not place or administer an order or did not observe a finding for a documented reason). The approach in CQL logic requires negation against the entire value set by providing a nullFlavor code and the value set object identifier (OID) in a QRDA Category I file to indicate "not done."

Thus, measured entities should not arbitrarily select one specific action referenced by a value set to indicate the action not taken but should instead indicate they did not take *any* actions referenced in the value set. This approach applies to all QDM datatypes using *negationRationale* to describe activities "not done for a reason" and when the eCQM specification for "not done" references a value set instead of a direct reference code. It does not change the expression of negation in the HQMF, but it does require using an HL7 nullFlavor code instead of a specific code from the value set associated with these activities in the QRDA Category I file.

The intent of the nullFlavor in this context is to specify that the measured entity intentionally did not do *all* the activities in the value set. It is not appropriate for a measured entity to certify that a clinician did not perform an activity using negation unless the measured entity intentionally did not order or perform the activity in question and documented a justification.

Figure 3.7 shows an example of "not done" in CQL from CMS108v13, Venous Thromboembolism Prophylaxis.

Figure 3.7. Example of "Not Done" in CQL

```
◢ No Mechanical or Pharmacological VTE Prophylaxis Due to Patient Refusal
    ( "No VTE Prophylaxis Medication Administered or Ordered"
        union "No Mechanical VTE Prophylaxis Performed or Ordered" ) NoVTEProphylaxis
        where NoVTEProphylaxis.negationRationale in "Patient Refusal"

◢ No VTE Prophylaxis Medication Administered or Ordered
    ["Medication, Not Administered": "Low Dose Unfractionated Heparin for VTE Prophylaxis"]
        union ["Medication, Not Administered": "Low Molecular Weight Heparin for VTE Prophlyaxis"]
        union ["Medication, Not Administered": "Injectable Factor Xa Inhibitor for VTE Prophylaxis"]
        union ["Medication, Not Administered": "Warfarin"]
        union ["Medication, Not Administered": "Rivaroxaban for VTE Prophylaxis"]
        union ["Medication, Not Ordered": "Low Dose Unfractionated Heparin for VTE Prophylaxis"]
        union ["Medication, Not Ordered": "Low Molecular Weight Heparin for VTE Prophlyaxis"]
        union ["Medication, Not Ordered": "Injectable Factor Xa Inhibitor for VTE Prophylaxis"]
        union ["Medication, Not Ordered": "Warfarin"]
        union ["Medication, Not Ordered": "Rivaroxaban for VTE Prophylaxis"]
```

Figure 3.8 shows a corresponding QRDA I negation instance example for "Medication, Not Administered: Low Molecular Weight Heparin for VTE Prophylaxis" due to patient refusal.

Figure 3.8. Corresponding QRDA I: Example of a Negation Instance "Not Done"

```
<!—Medication, Not Administered": "Low Molecular Weight Heparin for VTE Prophylaxis" →
<!—negationRationale in "Patient Refusal" →
<substanceAdministration classCode="SBADM" moodCode="EVN" negationInd="true" >
 ...
 <consumable>
   <manufacturedProduct classCode="MANU">
     ...
     <manufacturedMaterial>
        <code nullFlavor="NA" sdtc:valueSet="2.16.840.1.113883.3.117.1.7.1.219">
          <originalText>None of value set: Low Molecular Weight Heparin for VTE
Prophylaxis</originalText>
        </code>
     </manufacturedMaterial>
   </manufacturedProduct>
 </consumable>
 <author>
   <templateId root="2.16.840.1.113883.10.20.24.3.155" extension="2019-12-01"/>
   <time value="20251101060000"/>
   ...
 </author>
 <entryRelationship typeCode="RSON">
   <observation classCode="OBS" moodCode="EVN">
     …
     <code code= »77301-0 » codeSystem= »2.16.840.1.113883.6.1 » displayName= »reason »
codeSystemName= »LOINC »/>
     <value code="105480006" displayName="Refusal of treatment by patient (situation)"
       codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" xsi:type="CD"/>
   </observation>
 </entryRelationship>
</substanceAdministration>
```

Measured entities using these concepts must have a documented reason for patient exceptions in their EHRs and must demonstrate the relevant justification if audited by CMS.

A direct reference code could also serve to specify QDM elements in measure logic rather than creating value sets. For "not done" eCQM logic specified using value sets, use the same approach described previously when the item is "not done." To specify "not done" eCQM logic using a direct reference code, the measured entity should directly negate the direct reference code itself. For calendar year 2026 reporting, the 2026 CMS QRDA IG and the HL7 QRDA 1 Category 1 Standard for Trial Use (STU) 5.3 with errata provide additional guidance on how to use null values to describe activities that were "not done" using value sets, and how to report "not done" if using a direct reference code.

3.11 Entities

Entities represent concepts that can serve to specify details about the patient, a person related to the patient, a practitioner, an organization, or a location. They are not QDM datatypes or attributes. An eCQM can use these entities to provide further information required for an individual or organization to meet the eCQM's criteria.[5]

- Patient refers to an individual receiving health care services.
- Related person is someone involved in the care of a patient but not the direct target of care; this entity includes an identifier and a relationship, (for example, mother to a newborn infant).
- Practitioner is a person with formal responsibility to provide health care with an ability to reference an identifier, role, qualification, or specialty.
- Organization is a grouping of people or organizations with a common purpose and includes identifier and datatype attributes.
- Location is information about a physical place and includes identifier and *locationType* attributes.

Full definitions of the five entities and their attributes as well as technical details are available in QDM v5.6. Information on which versions to use in each reporting or performance period are available at the eCQI Resource Center eCQM Standards and Tools Versions.

3.12 Supplemental Value Sets

Supplemental value sets are used in eCQMs to capture categories such as race, ethnicity, sex, and payer that are not essential to the functioning of the measure.

[5] For additional information, go to QDM v5.6.

3.12.1 Race and Ethnicity

The eCQM specifications limit the reporting of patient race to the Centers for Disease Control and Prevention's (CDC's) value set "Race" (OID: 2.16.840.1.114222.4.11.836):

Code	Description
1002-5	American Indian or Alaska Native
2028-9	Asian
2054-5	Black or African American
2076-8	Native Hawaiian or Other Pacific Islander
2106-3	White
2131-1	Other Race

To report an individual patient with a single race category in QRDA Category I, measured entities report one of the five U.S. Office of Management and Budget race category codes (1002-5, 2028-9, 2054-5, 2076-8, and 2106-3) in raceCode. To report an individual patient with more than one race category, the measured entity reports one race in raceCode and additional races using sdtc:raceCode. In accordance with the standard, all the race codes placed here are equivalent in priority. Users should not use QRDA Category I, *Other Race* 2131-1, because null values are not appropriate to represent missing patient race information, as described below.

For QRDA Category III files, users should identify a patient with multiple races using raceCode category 2131-1 *Other Race*. This enables measured entities to report patients with multiple races in an aggregate document without creating multiple entries for a single patient with multiple races. Only QRDA Category III files should use the raceCode 2131-1 *Other Race* to express a raceCode category.

Similarly, the specifications limit the reporting of ethnicity to the CDC value set "Ethnicity" (OID: 2.16.840.1.114222.4.11.837):

Code	Description
2135-2	Hispanic or Latino
2186-5	Not Hispanic or Latino

The 2024 Health Data, Technology, and Interoperability: Certification Program Updates, Algorithm Transparency, and Information Sharing (HTI-1) rule requires health IT developers certified under the Health IT Certification Program to do the following:

§170.315 (a)(5) *Patient demographics and observations*

> Enable a user to record, change, and access patient demographic and observations data including race, ethnicity, preferred language, sex…name to use…and date of birth.
>
> §170.315 (a)(5)(A) *Race and ethnicity*
>
> (*1*) Enable each one of a patient's races to be recorded in accordance with, at a minimum, the standard specified in §170.207(f)(3) and whether a patient declines to specify race.

> (*2*) Enable each one of a patient's ethnicities to be recorded in accordance with, at a minimum, the standard specified in §170.207(f)(3) and whether a patient declines to specify ethnicity.

Notably, the CDC value sets for race and ethnicity do not contain code(s) for patient declined. To communicate that a demographic element is unknown or the patient declined to provide the information for race and ethnicity, use the built-in nullFlavor feature of QRDA. The nullFlavor feature works for race, ethnicity, preferred language, and other cases in which the QRDA calls for a value from a value set and allows the nullFlavor as specified by the standard.

Generally, QRDA represents race as:

```
<raceCode code="2106-3"
displayName="White"codeSystem="2.16.840.1.113883.6.238"/>
```

When the value is unknown, use the nullFlavor UNK for "Unknown:"

```
<raceCode nullFlavor="UNK"/>
```

When the patient declines to specify, use the nullFlavor ASKU for "Asked but Unknown:"

```
<raceCode nullFlavor="ASKU"/>
```

3.12.2 Sex

eCQMs identify a patient's sex using SNOMED CT codes from the "Federal Administrative Sex" (OID: 2.16.840.1.113762.1.4.1021.121) value set. For reporting/performance year 2026, this extensional value set contains the following values:

Code	Description
248152002	Female (finding)
248153007	Male (finding)

Please see the 2026 CMS QRDA I IG for more detailed guidance on how to report values for this supplemental data element.

3.13 ICD-9 and ICD-10 Codes in Value Sets

3.13.1 Use of Nonclinical or Administrative Code Systems

Specifications for eCQMs include terminologies in value sets derived from clinical vocabulary standards and those originally specified for administrative purposes, such as billing and payment or mortality data. As an example, diagnosis value sets contain terms in the standard vocabulary (SNOMED CT) and the native capture terminologies (ICD-9-CM and ICD-10-CM/PCS). A complete list of value sets and direct reference codes used in eCQMs is available for download from the VSAC.

CMS formally retired the use of the ICD-9-CM code system for billing and reporting purposes. eCQMs may continue to use ICD-9-CM codes, however, to represent historical data and/or data

permitted by CMS per a consensus-based decision across the eCQM interested parties, federal agencies, and partners.

eCQM implementers should carefully review technical release notes and value sets posted to the eCQI Resource Center to determine the areas in which value set changes might affect their ability to capture data for the 2026 reporting and performance period and adjust accordingly.

3.14 Display of Human-Readable HQMF

The measure specification package file contains the human-readable HTML file of an eCQM. Users can also view the human-readable display directly on the eCQM page for a specific eCQM on the eCQI Resource Center.

4. eCQM Guidance

CMS provides eCQM guidance to help users understand and implement eCQMs. This guidance is available in the human-readable HTML and the eCQM HQMF XML in the measure specification package zip files located on the eCQI Resource Center. On this site, select one of the following three criteria to view program-specific measures, organized by reporting period:

- Eligible Clinician eCQMs
- Hospital - Inpatient eCQMs
- Hospital - Outpatient eCQMs

Guidance is available in the eCQM header, in the inline comments in the eCQM logic itself, and in the technical release notes of each eCQM posted on the eCQI Resource Center. This guidance is critical to the correct implementation of the eCQM. The technical release notes, which describe changes to measures between different versions, are available on the eCQI Resource Center.

5. ASTP/ONC Project Tracking System (Jira)

CMS contractors manage and respond to eCQM interested parties through the ASTP/ONC Project Tracking System (Jira). This system supports feedback and questions that apply to all phases of the eCQM life cycle, including development, approval, implementation, and updates regarding eCQM intent, specifications, certification, standards, and errors. Interested parties should report issues related to eCQMs on Jira, especially questions about eCQM specifications. Interested parties can also ask questions or raise issues about eCQM tools and standards in different projects within Jira. Quality reporting issue trackers found on Jira include the following:

- CMS Hybrid Measures—CMS hybrid measure issues and questions
- CQL Issue Tracker—CQL development, implementation, and standards issues
- CYPRESS Issue Tracker—Certification testing tool test cases and implementation issues
- eCQM Issue Tracker—eCQM implementation and value sets issues
- eCQM Known Issues —Implementation information on eCQMs with known technical issues for which a solution is under development but not yet available in a published eCQM specification
- MADiE Issue Tracker—eCQM development and testing tool issues
- QDM Issue Tracker—QDM development and implementation issues
- QRDA Issue Tracker—QRDA implementation issues
- QDM Known Issues —Guidance for eCQM developers and implementers on interpreting QDM attributes located on the CQL Formatting and Usage Wiki (not in Jira)
- QRDA Known Issues Dashboard—Implementation information for QRDA IGs or supporting documents with known technical issues for which a solution is under development but not yet published
- USCDI+ Quality—Feedback on draft USCDI+ Quality data element list

A user must create an account to submit, watch, or comment on an issue. Before reporting a new issue, eCQM interested parties should first search the applicable Jira project to determine whether a similar question has been previously submitted and addressed. If someone previously reported a similar issue, interested parties can follow the issue and receive updates.

When reporting a new issue, interested parties should fill out the ticket completely, selecting a title summarizing the issue, describing the issue in the description field, including the measure name and version number when applicable, and selecting an appropriate issue type. CMS encourages interested parties to add attachments—though never any that include protected health information—to facilitate a quick and accurate response. If interested parties enter insufficient information, the assignee will be unable to provide a response until the interested party updates the ticket. If the interested party does not provide clarifying information within 10 business days of submitting the initial inquiry, the administrator will close the ticket. Once the assignee provides a solution, the assignee will update the ticket to a status of "Closed." Please note, there may be delays in responding to issues requiring feedback from more than one team or assignee.

If a response is insufficient to answer an issue, the interested party may add a comment to the existing issue and explicitly state how the previous answer did not adequately address the issue, citing any previous ticket numbers if applicable. It is appropriate to comment regarding a missing resolution if there has not been any update or response in more than 10 business days and there is no comment from the assignee explaining the delay or when the resolution will be available.

6. CMS Quality Program Helpdesks

Questions regarding CMS quality and value-based purchasing program reporting requirements can be addressed to the following Helpdesks.

Table 6.1. Helpdesk Contact Information for CMS Quality Reporting Programs

CMS Quality Reporting Program	Helpdesk Contact Info
Hospital Inpatient Quality Reporting (IQR) and PPS-Exempt Cancer Hospital Quality Reporting (PCHQR)	Hospital Inpatient Support Team Quality Question and Answer Tool (844) 472-4477
Hospital Outpatient Quality Reporting (OQR) and Rural Emergency Hospital Quality Reporting (REHQR)	Hospital OQR Support Quality Question and Answer Tool (866) 800-8756
Making Primary Care (MCP)	MCP Help Desk 1-888-734-6433, option 6 MCP@cms.hhs.gov
Primary Care First (PCF)	PCF Support 1-888-517-7753 PCF@telligen.com
Quality Payment Program (QPP)	QPP@cms.hhs.gov (866) 288-8292
Medicare Promoting Interoperability (formerly EHR Incentive) Programs QualityNet reporting and data uploads	QNetSupport@cms.hhs.gov (866) 288-8912

Version History

Version	Date	Author/Owner	Description of Change
1.13	May 5, 2017	CMS/ONC (MITRE)	• Updated language in Introduction to include Merit-based Incentive Payment System Eligible Clinician and broadened from specific quality reporting programs to generic • Removed tools, resources, and standards references; now referencing the eCQI Resource Center for this information • Renumbered and updated Table 3, Example Inputs and Results for Overlap
			Section 2: • Updated language in subsections 2.1, 2.2, 2.3, 2.4 • Converted table graphic to image, Figure 1 (Sample Measure Item Count), in subsection 2.2
			Section 3: • Modified introductory paragraph in Section 3 • Removed Tables 1 and 2, Eligible Clinician eCQM Types and Versions and Eligible Hospital eCQM Types and Versions
			Section 4: • Updated language and logic sample in subsections 4.3.1, 4.3.3, 4.6, 5.2, 5.3 • Updated language in subsections 4.3.2, 4.3.4, 4.3.5
			Section 6: • Updated language in subsection 6.1—UHSIK • Updated language in subsection 6.2—QDM Category and Code System • Updated language in subsection 6.5—Allergies to Medications and Other Substances • Updated language in subsection 6.6—Principal Diagnosis in Inpatient Encounters • Updated language in subsection 6.9—Activities That Were “Not Done” • Updated language in subsection 6.10—Newborn/Gestational Age • Updated language in subsection 6.11—Source • Updated language in subsection 6.12—Patient Characteristic Birthdate and Patient Characteristic Expired • Added subsection 6.15.2—The 2016 Value Set Addendum

Version	Date	Author/Owner	Description of Change
			Appendix B • Updated table number for Table 3 Time Interval Definitions and Examples • Updated acronym list
2.0	May 4, 2018	CMS (MITRE)	• Updates and edits resulting in version 2.0 for release
3.0	May 3, 2019	CMS (Mathematica)	• Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout • Revised text based on input from interested parties and external reviewers • Updated acronym list
4.0	May 2020	CMS (Mathematica)	• Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout • Revised text based on input from interested parties and external reviewers • Updated acronym list
5.0	May 2021	CMS (Mathematica)	• Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout • Removed measure tables • Revised text based on input from interested parties and external reviewers • Added section on hybrid measures, Program Candidate measures, and telehealth information • Added reference to eCQM and QRDA Known Issue trackers
6.0	May 2022	CMS (Mathematica)	• Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout • Revised text based on input from interested parties and external reviewers
7.0	May 2023	CMS (Mathematica)	• Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout • Revised text based on input from interested parties and external reviewers
8.0	May 2024	CMS (Mathematica)	• Added section related to ratio measures • Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout • Revised text based on input from interested parties and reviewers • Updated acronym list • Revised all instances of “pre-rulemaking” to “program candidate” • Made revisions for clarity throughout • Moved to active voice • Replaced the term “stakeholders” with “interested parties”

Version	Date	Author/Owner	Description of Change
9.0	May 2025	CMS (Mathematica)	• Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout • Revised text based on input from interested parties and reviewers • Made revisions for clarity throughout • Updated section on ratio measures to align with MMS Hub resources • Removed appendix with specific standards and code systems used in updated eCQMs and directed readers to eCQI Resource Center

Appendix A. Standards and Code Systems

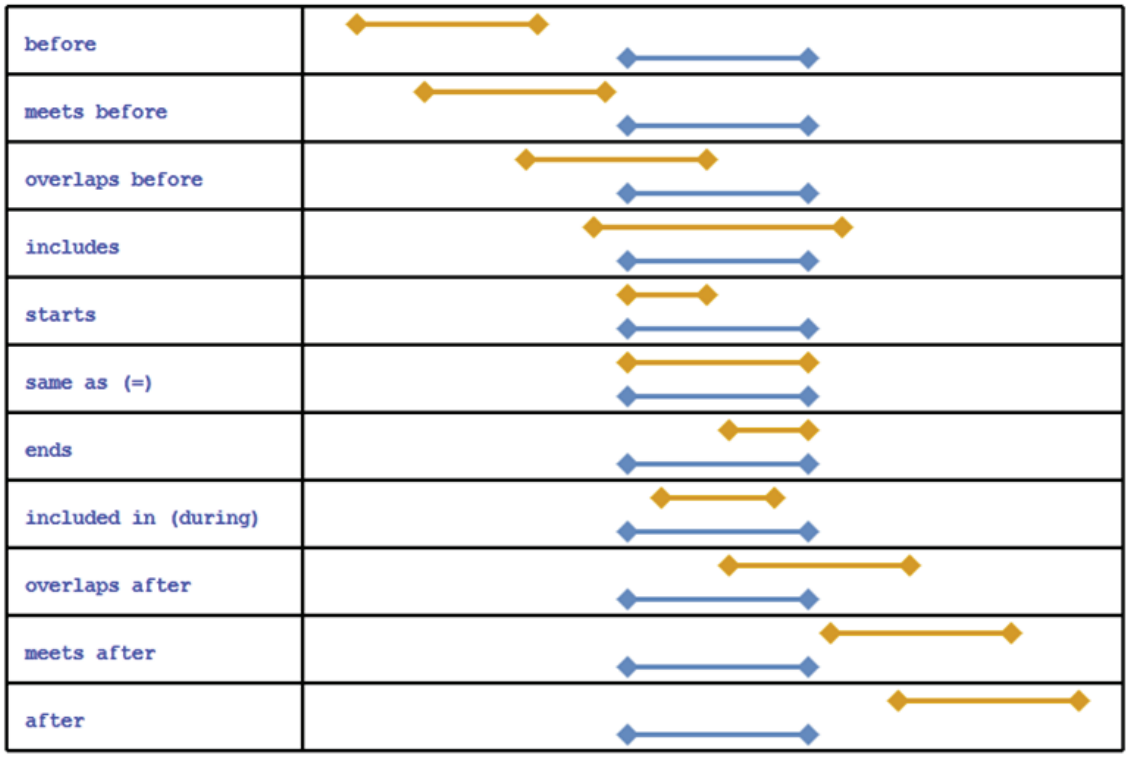
The standards and code systems used in the updated eCQM specifications for the 2026 reporting/performance period can be found on the eCQI Resource Center's Standards and Tools Versions Table or in the eCQMs Annual Update Pre-Publication Document for the 2026 Reporting/Performance Period.

Appendix B. Time Interval Definitions and Examples

Interval Operators

The CQL standard provides a complete set of interval comparison operators (Figure B.1).

Figure B.1. Interval Comparison Operators

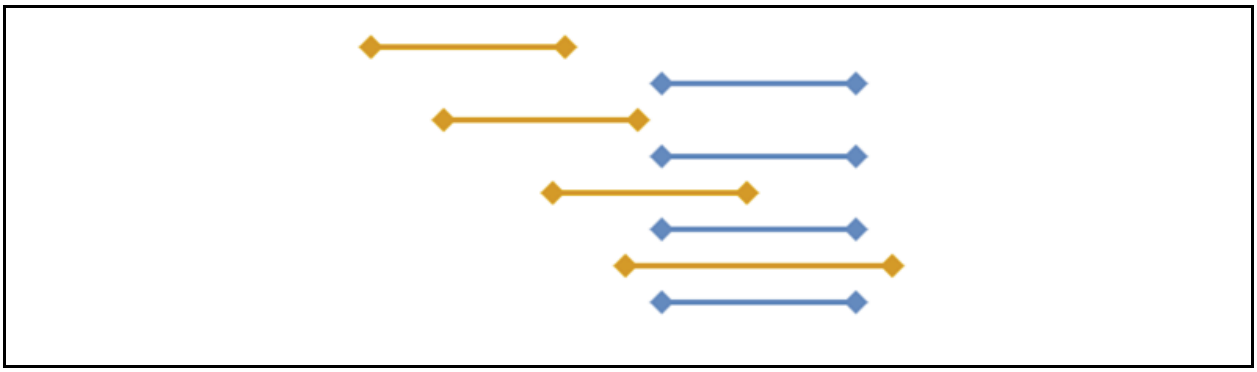


Timing Phrases

The CQL standard also supports timing phrases (Figure B.2) to make it easier to express precise relationships between intervals using natural language. The before and after operators can have a prefix of starts or ends and a suffix of start or ends. For example:

Interval X starts before start Interval Y

Figure B.2. Interval Starts before Start

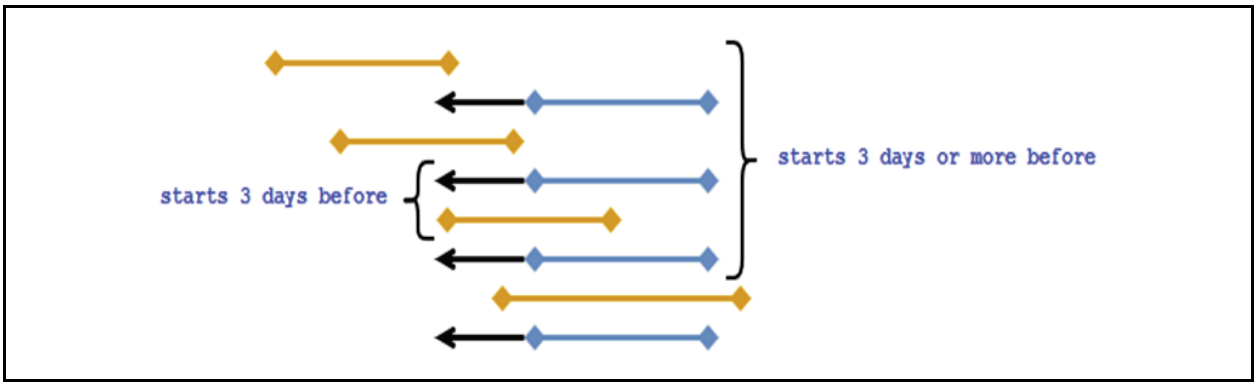


The before and after operators can also take an offset indicating how far away a given relationship should be. The offset can be absolute, indicating the boundary of the interval must be on the offset, or it can be relative, indicating the boundary must be at least on the offset (Figure B.3):

Interval X starts 3 days before start Interval Y

Interval X starts 3 days or more before start Interval Y

Figure B.3. Interval Starts before Start with Offset



You can also specify a range for the boundary relationship using the within…of operator, as shown in Figure B.4:

Interval X starts within 3 days of start Interval Y

Figure B.4. Interval Starts Within

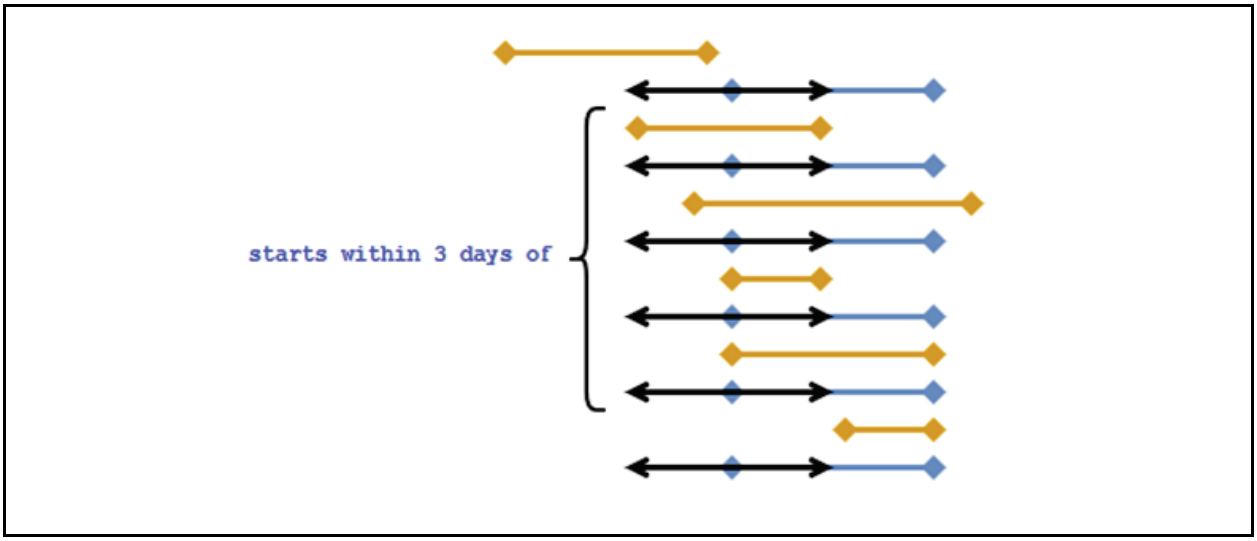


Table B.1. Time Interval Definitions and Examples

Unit	CQL definition	Examples
Year	Defined as the duration of any time interval starting at a certain time of day, at a certain calendar date of the calendar year, and ends at: • The same time of day on the same calendar date of the next calendar year, if it exists OR • The same time of day on the immediately following calendar date of the next calendar year, if the same calendar date of the next calendar year does not exist **Note:** If, in the next calendar year, the same calendar date does not exist, the International Organization for Standardization states the ending calendar day has to be agreed upon. CQL uses this convention.	Month (date 2) < month (date 1): Duration (years) = year (date 2) - year (date 1) - 1 **Example 1:** Date 1: 2012-**03**-10 22:05:09 Date 2: 2013-**02**-18 19:10:03 Duration = year (date 2) - year (date 1) - 1 = 2013 - 2012 - 1 = **0 years** Month (date 2) = month (date 1) and day (date 2) >= day (date 1) Duration (years) = year (date 2) - year (date 1) **Example 2.a:** day (date 1) = day (date 2) Date 1: 2012-03-**10** 22:05:09 Date 2: 2013-03-**10** 22:05:09 Duration = year (date 2) - year (date 1) = 2013 - 2012 = **1 year** **Note*:*** Time of day is important in this calculation. If the time of day of date 2 was less than the time of day for date 1, the duration of the time interval would be 0 years according to the definition.
		Example 2.b: day (date 2) > day (date 1) Date 1: 2012-03-10 22:05:09 Date 2: 2013-03-20 04:01:30 Duration = year (date 2) - year (date 1) = 2013 - 2012 = **1 year** Month (date 2) = month (date 1) and day (date 2) < day (date 1) Duration (years) = year (date 2) - year (date 1) - 1 **Example 3.a:** Date 1: 2012-02-29 Date 2: 2014-02-28 Duration = year (date 2) - year (date 1) - 1 = 2014 - 2012 - 1 = **1 year**
		Month (date 2) > month (date 1) Duration (years) = year (date 2) - year (date 1) **Example 4.a:** Date 1: 2012-*03*-10 11:16:02 Date 2: 2013-*08*-15 21:34:16 Duration = year (date 2) - year (date 1) = 2013 - 2012 - **1 year** **Example 4.b:** Date 1: 2012-*02*-29 10:18:56 Date 2: 2014-*03*-01 19:02:34 Duration = year (date 2) - year (date 1) = 2014 - 2012 = **2 years** **Note*:*** Because there was no February 29 in 2014, the number of years can only change when the date reaches March 1, the first date in 2014 that surpasses the month and day of date 1 (February 29).

Unit	CQL definition	Examples
Month	Defined as the duration of any time interval that starts at a certain time of day at a certain calendar day of the calendar month and ends at: The same time of day at the same calendar day of the ending calendar month, if it exists OR The same time of day at the immediately following calendar date of the ending calendar month, if the same calendar date of the ending month in the ending year does not exist **Note:** If, in the next calendar year, the same calendar date does not exist, the International Organization for Standardization states that the ending calendar day has to be agreed upon. CQL uses this convention.	Day (date 2) >= day (date 1) Duration (months) = (year (date 2) - year (date 1)) * 12 + (month (date 2) - month (date 1)) **Example 1.a:** Date 1: 2012-03-01 14:05:45 Date 2: 2012-03-31 23:01:49 Duration = (year (date 2) - year (date 1)) * 12 + (month (date 2) - (month (date 1)) = (2012 - 2012) * 12 + (3 - 3) = **0 months** **Example 1.b:** Date 1: 2012-03-10 22:05:09 Date 2: 2013-06-30 13:00:23 Duration = (year (date 2) - year (date 1)) * 12 + (month (date 2) - (month date 1)) = (2013 - 2012) * 12 + (6 - 3) = 12 + 3 = **15 months** Day (day 2) < day (date 1) Duration (months) = (year (date 2) - year (date 1)) * 12 + (month (date 2) - month (date 1)) - 1 **Example 2:** Date 1: 2012-03-10 22:05:09 Date 2: 2013-01-09 07:19:33 Duration = (year (date 2) - year (date 1)) * 12 + (month (date 2) - month (date 1)) – 1 = (2013 - 2012) * 12 + (1 - 3) - 1 = 12 - 2 - 1 = **9 months**
Weeks	Defined as a duration of any time interval starting at a certain time of day at a certain calendar day at a certain calendar week and ends at the same time of day at the same calendar day of the ending calendar week. In other words, a complete week is always seven days long.	Duration = [date 2 - date 1 (days)] / 7 **Example 1:** Date 1: 2012-03-10 22:05:09 Date 2: 2012-03-20 07:19:33 Duration = [# days (month (date 1)) - day (date 1) + # days (month (date 1) + 1) + #days (month (date 1) + 2) + ... + # days (month (date 2) - 1) + day (date 2)] / 7 = (20 - 10) / 7 = 10 / 7 = **1 week**
Days	Defined as a duration of any time interval starting at a certain calendar day and ends at the next calendar day (1 second to 23 hours, 59 minutes, and 59 seconds). The duration in days between two dates will generally be given by subtracting the start calendar date from the end calendar date, respecting the time of day between the two dates.	Time (date 2) < time (date 1) Duration = [date 2 - date 1 (days)] - 1 **Example 1:** Date 1: 2012-01-31 12:30:00 Date 2: 2012-02-01 09:00:00 Duration = 02-01 - 01-31 - 1 = **0 days** Time (date 2) >= time (date 1) Duration = date 2 - date 1 (days) **Example 2:** Date 1: 2012-01-31 12:30:00 Date 2: 2012-02-01 14:00:00 Duration = 02-01 - 01-31 = **1 day**

Unit	CQL definition	Examples
Hours	Each hour is 60 minutes. The duration in hours between two dates is the number of minutes between the two dates divided by 60. The unit truncates the result.	**Example 1:** Date 1: 2012-03-01 03:10:00 Date 2: 2012-03-01 05:09:00 Duration = **1 hour** **Example 2:** Date 1: 2012-02-29 23:10:00 Date 2: 2012-03-01 00:10:00 Duration = **1 hour** **Example 3:** Date 1: 2012-03-01 03:10 Date 2: 2012-03-01 04:00 Duration = **0 hours**
Minutes	Each minute is 60 seconds. The duration in minutes between two dates is the number of seconds between the two dates divided by 60. The unit truncates the result.	**Example 1:** Date 1: 2012-03-01 03:10:00 Date 2: 2012-03-01 05:20:00 Duration = **130 minutes** **Example 2:** Date 1: 2012-02-29 23:10:00 Date 2: 2012-03-01 00:20:00 Duration = **70 minutes**

Acronyms

API	application programming interface
ASTP	Assistant Secretary for Technology Policy
CAD	coronary artery disease
CDC	Centers for Disease Control and Prevention
CDCREC	Centers for Disease Control and Prevention Race and Ethnicity Code Set
CDT	Current Dental Terminology
CM	Clinical Modification
CMS	Centers for Medicare & Medicaid Services
CPT	Current Procedural Terminology
CQL	Clinical Quality Language
CVX	Clinical Vaccine Formulation
DENEX	denominator exclusion
DENOM	denominator
DERep	Data Element Repository
DEXCEP	denominator exception
EC	eligible clinician
eCQI	Electronic Clinical Quality Improvement
eCQM	electronic clinical quality measure
ED	emergency department
EHR	electronic health record
HCPCS	Healthcare Common Procedure Coding System
HHS	Department of Health and Human Services
HL7	Health Level Seven International
HQMF	Health Quality Measure Format
HTML	Hypertext Markup Language
HSLOC	Healthcare Service Location Codes
ICD	International Classification of Diseases
IG	implementation guide
IN	ingredient (RxNorm term type)
IP	initial population

IPSD	index prescription start date
IQR	Inpatient Quality Reporting
ISO	International Organization for Standardization
LVEF	left ventricular ejection fraction
LOINC	Logical Observation Identifiers Names and Codes
MADiE	Measure Authoring Development Integrated Environment
MI	myocardial infarction
MIPS	Merit-based Incentive Payment System
MMS	Measures Management System
MSRPOPL	Measure Population
MSRPOPLEX	Measure Population Exclusion
NHSN	National Healthcare Safety Network (CDC)
NLM	National Library of Medicine
NUMER	numerator
NUMEX	numerator exclusion
OID	object identifier
ONC	Office of the National Coordinator for Health Information Technology
OQR	Outpatient Quality Reporting
PIN	precise ingredient (RxNorm term type)
PCS	Procedure Coding System
QDM	Quality Data Model
QPP	Quality Payment Program
QRDA	Quality Reporting Document Architecture
SNOMED CT	Systematized Nomenclature of Medicine Clinical Terms
SOP	Source of Payment
VSAC	Value Set Authority Center
XML	Extensible Markup Language