Centers for Medicare & Medicaid Services

Guide for Reading Electronic Clinical Quality Measures (eCQMs)

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Table of Contents

Tables

Figures

1. Introduction

An electronic clinical quality measure (eCQM) is a measure specified in a standard format that uses data electronically extracted from electronic health records (EHRs) and/or health information technology (IT) systems to measure health care quality. Ideally, the data is captured in structured form during the process of patient care. The Centers for Medicare & Medicaid Services (CMS), which uses eCQMs in quality reporting and incentive programs, is working to reduce the burden of collecting and reporting health care quality performance data by drawing on the capabilities of health IT systems and EHRs.

1.1 Using This Guide

This Guide seeks to help measured entities, including clinicians and hospitals, quality analysts, eCQM implementers, and health IT vendors understand eCQMs and their related documents. The Guide provides background on Quality Data Model (QDM) eCQM packages and an overview of the human-readable format of eCQMs.[1] Please note that most eCQM examples provided throughout this Guide draw from the eCQM specifications posted for the 2025 reporting/performance period. Exceptions to this practice are the examples in Tables 3.1 and 3.2 and Figure A.1, which draw from eCQM specifications posted for the 2026 reporting/performance period to show the updated formatting and naming conventions used in Measure Authoring Development Integrated Environment (MADiE) output files.

For information on how to develop an eCQM, please refer to the Blueprint content on the CMS Measures Management System (MMS) Hub and the supplemental materials on the MMS Resources and Templates page. For more information on implementing an eCQM, please refer to the eCQM Logic and Implementation Guidance document on the Electronic Clinical Quality Improvement (eCQI) Resource Center's Eligible Clinician eCQMs, Hospital - Inpatient eCQMs, or Hospital - Outpatient eCQMs Resources tables. For more information on understanding harmonization efforts across the eCQMs, please refer to the Quality Data Model (QDM)-based Clinical Quality Language (CQL) Style Guide on the eCQI Resource Center CQL Tools & Resources page.

[1] Further information on Fast Healthcare Interoperability Resources (FHIR) eCQM packages can be located on the eCQI Resource Center.

2. eCQM Building Blocks—Standards and Tools

2.1 Standards

Measure developers use several standards to identify data, define the data elements used in eCQMs, and express the timing and relationships between them. Visit the eCQI Resource Center to learn more about standards.

2.1.1 Health Quality Measure Format

Health Quality Measure Format (HQMF) is a Health Level Seven International® (HL7) standard format for documenting the content and structure of an eCQM.[2] Intended to represent eCQMs used in a health care setting, HQMF is an Extensible Markup Language (XML) document describing how to compute an eCQM. The HQMF provides consistency and unambiguous interpretation through standardization of an eCQM's structure, metadata, definitions, and logic. More information on the HQMF is available on the eCQI Resource Center.

2.1.2 Quality Data Model

The QDM is the information model measure developers use to define the data necessary to describe the eCQM components, such as the numerator and denominator for a proportion measure. To create an eCQM, developers must define data elements consistently based on the QDM. The Blueprint content on the CMS MMS Hub outlines this process. The eCQI Resource Center provides more information about the QDM. The next subsection provides a brief overview of some of the key elements of the QDM that can help in reading and interpreting eCQMs.

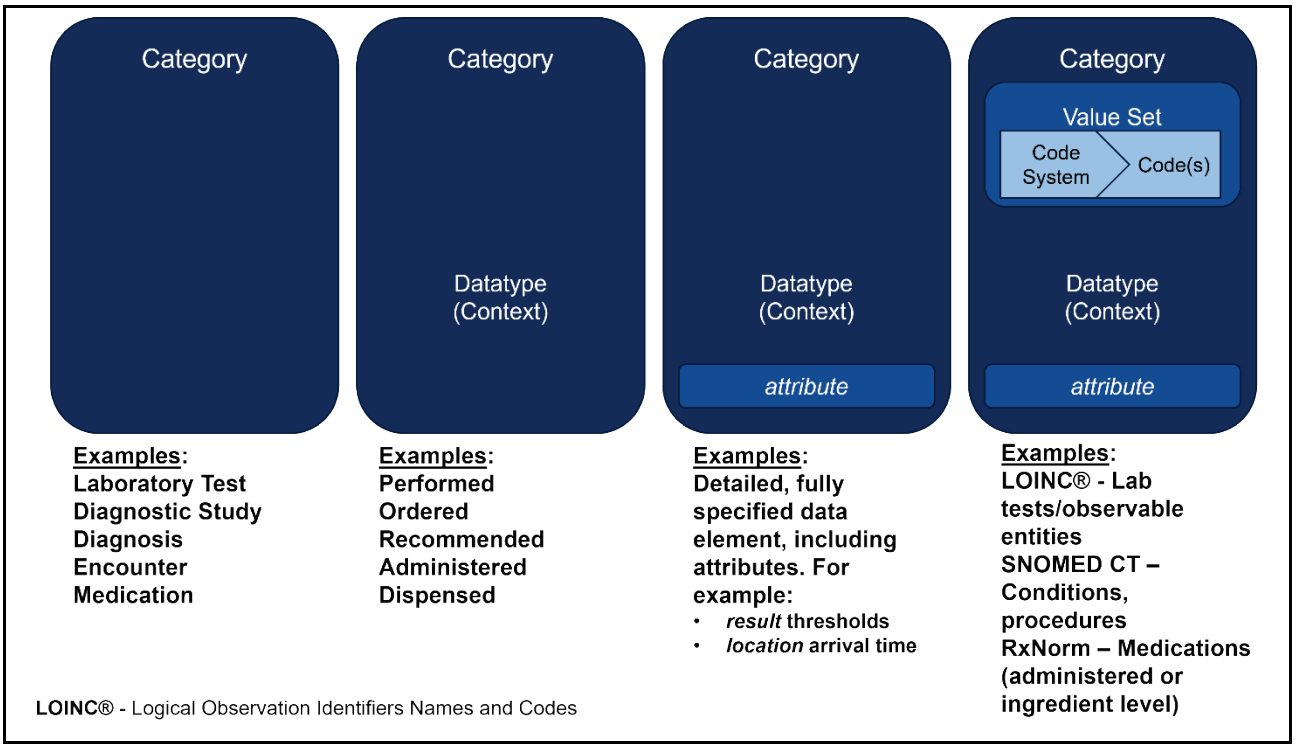
2.1.2.1 QDM Data Element

The QDM uses a specific structure to define a data element. Figure 2.1 shows the structure of a QDM data element:

1. QDM category is the class or group of information a quality measure can address, for example, Diagnosis, Medication, Procedure, or Laboratory Test.
2. QDM datatype provides the context, or status, desired with respect to the QDM category. For example, a request for a laboratory test, "Laboratory Test, Ordered" is distinguished from a completed test, "Laboratory Test, Performed."
3. QDM attributes represent information about a QDM data element (or metadata) that must exist in data retrieved from the EHR or health IT systems to calculate the eCQM results.
    - Attributes include concepts such as start and stop times, results, and locations. Each QDM datatype has a specific set of attributes acceptable for use in an eCQM.
4. Combining the QDM datatype with a value set or direct reference code (DRC) makes a QDM data element (for example, ["Laboratory Test, Performed": "HIV Lab Tests"]).

[2] HL7 is a nonprofit organization that develops standards accredited by the American National Standards Institute (ANSI).

Figure 2.1. QDM Data Element Structure: Building a QDM Data Element Using QDM Categories, Context (Datatype), Attributes, and Value Sets or Direct Reference Codes[3]

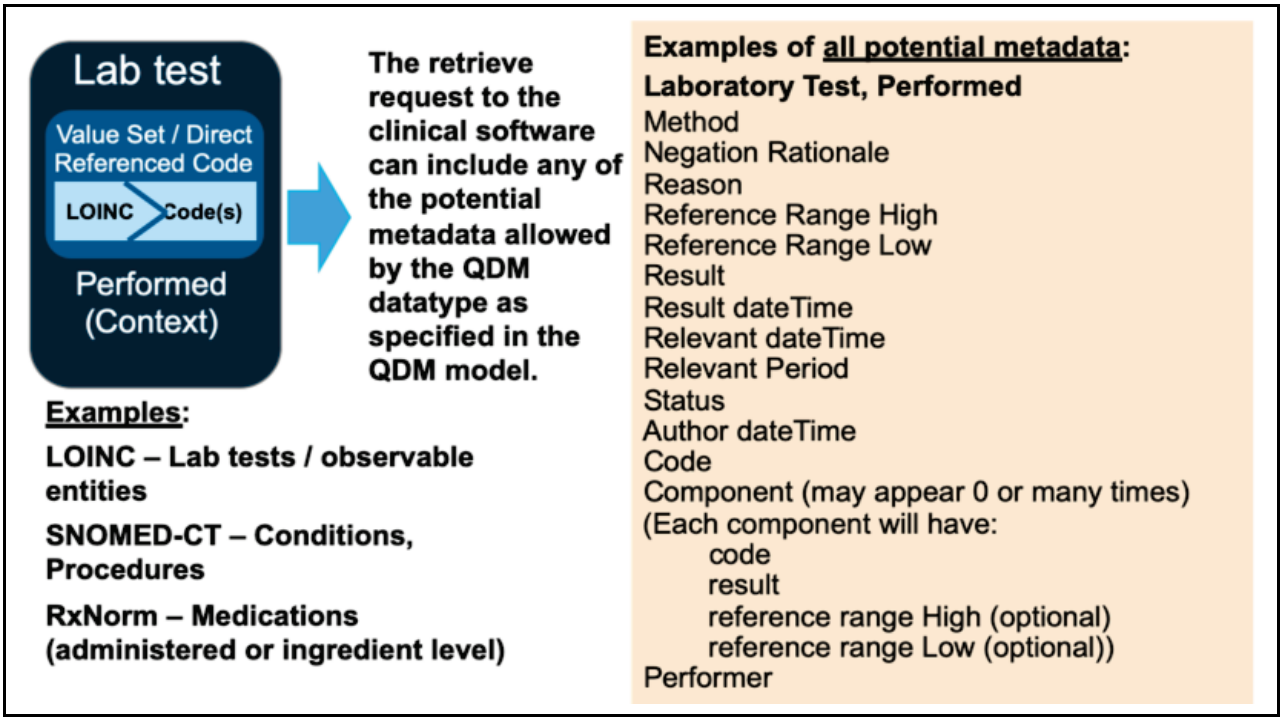


For complete technical details about the QDM, such as definitions of all QDM datatypes and attributes, please refer to the QDM version 5.6 specification. For information on versions to use in each reporting/performance period, please visit the eCQI Resource Center eCQM Standards and Tools Versions page.

An eCQM specified with CQL logic expressions lists the QDM data elements in the Data Criteria (QDM Data Elements) section and their respective value sets or DRCs in the Terminology section. Value sets or DRCs used for QDM attributes appear only in the Terminology section of the eCQM. Note the human-readable HyperText Markup Language (HTML) file includes both the eCQM's QDM data elements and the attributes. However, the HQMF XML file shows only the QDM data elements without the attributes. The HTML and CQL files include both the QDM data elements and their respective attributes. Figure 2.2 shows how measure developers use QDM components with a CQL-based eCQM.

[3] Adapted from Centers for Medicare & Medicaid Services. "Quality Data Model, Version 5.6: QDM Data Element Structure." Section 2.5, January 2021, p. 7. https://ecqi.healthit.gov/sites/default/files/QDM-v5.6-508.pdf.

Figure 2.2. Description of a Laboratory Test[4]



2.1.3 CQL

CQL is an HL7 normative standard[5] defining a high-level, clinically focused language used to specify eCQM criteria and clinical decision support rules. The language is understandable to humans but structured enough for implementers to process electronically, streamlining the implementation of eCQMs. CQL provides a common expression standard for eCQMs and clinical decision support. More information on CQL is available on the eCQI Resource Center.

2.2 Tools

2.2.1 MADiE

MADiE is a software tool that provides integrated measure authoring and testing functionalities. MADiE supports editing and testing of QDM measures. As of June 2024, all eCQM authoring and testing occurs in the MADiE tool. To learn how to use the MADiE tool, please refer to the MADiE User Guide on the MADiE Training & Resources page.

Some eCQM package files for previous reporting/performance years that were published through the now-decommissioned Measure Authoring Tool may use different naming conventions than

[4] Adapted from Centers for Medicare & Medicaid Services. "Quality Data Model, Version 5.6: Description of "Laboratory Test, Performed" Attributes with CQL for QDM 5.6." Section 2.5, January 2021, p. 8. https://ecqi.healthit.gov/sites/default/files/QDM-v5.6-508.pdf.

[5] A normative standard is a relatively stable standard developed by the ANSI to maintain backward compatibility with new versions. Backward compatibility means implementing the new standard will not break the applications using the standard. For additional information, see https://confluence.hl7.org/display/HL7/Understanding+the+Standards+Process.

those used for the eCQM package files published through MADiE. The same applies for naming conventions within eCQM packages. This guide uses MADiE naming conventions.

2.2.2 Value Set Authority Center

The Value Set Authority Center (VSAC) is a central repository for the official versions of value sets and DRCs included in eCQMs. Value sets are lists of codes and corresponding terms drawn from standard clinical vocabularies, defining clinical and administrative concepts, such as diagnoses, clinical visits, and patient characteristics. Examples of standard clinical vocabularies used to create value sets are Current Procedural Terminology (CPT), International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM), Systemized Nomenclature of Medicine – Clinical Terms (SNOMED CT), and Logical Observation Identifiers Names and Codes® (LOINC). The National Library of Medicine maintains the VSAC, provides downloadable access to the value sets, and updates versions of the terminology code systems used in CMS quality programs at least once each year. Access to eCQM value sets in VSAC requires a free Unified Medical Language System® license.

2.2.2.1 Value Sets

A value set is a specific set of codes and their descriptors that define a clinical or administrative concept. Value sets contain the codes expected to appear (or be available via cross-code system mapping) in the clinical record or administrative data.[6] Each value set has an assigned numeric object identifier (OID). In the human-readable HTML document, value sets have both a name (*value_set_name*) and an identifier (*value_set_OID*). In CQL, the use of a value set in an eCQM is indicated by square brackets. The following example depicts the use of a value set within CQL:

```
exists ["Diagnosis": "Diabetes"]
```

Here, Diabetes is the *value_set_name,* and the *value_set_OID* is 2.16.840.1.113883.3.464.1003.103.12.1001. This value set is an example of a grouping value set that contains several other extensional value sets of differing code systems. Measure developers create, manage, and distribute value sets used in eCQMs in the VSAC.

The VSAC provides several options for downloading value set information.

- The VSAC Download tab includes three download options for each reporting/performance period: Sorted by CMS ID, Sorted by Value Set Name, and Sorted by QDM Category. These workbooks provide additional detail about each value set, including code system OIDs and versions. Please note that in files sorted by CMS ID and value set name, column F (QDM Category) is blank for value sets used only for QDM attributes, because an attribute may be used by more than one QDM category. The download sorted by QDM category does not contain any value sets used only for QDM attributes.

[6] If cross-code system mapping is conducted, implementers should maintain documentation in case of a CMS audit.

- The Search Value Sets tab in the VSAC is an additional method for browsing and downloading eCQM value sets that are filtered by program. On this tab, users can download Excel spreadsheets containing metadata and contents.
- Users can retrieve eCQM value sets programmatically with the VSAC Sharing Value Sets Application Programming Interface (VSAC SVS API) using the release parameter and correct release name corresponding with the desired eCQM publication date listed on the VSAC Download tab.

2.2.2.2 Direct Reference Codes

If a single code—rather than a collection of codes in a value set—can define a clinical or administrative concept, the eCQM expression embeds the code directly into the CQL logic statements. This method of expression is called a direct reference code, or DRC. The Terminology section of the HQMF lists DRCs and the OIDs of the code systems from which the codes derive (for example, SNOMED CT or LOINC). As Figure 2.3 shows, the Terminology section for CMS154v13, Appropriate Treatment for Upper Respiratory Infection (URI), contains five DRCs.

Figure 2.3. Direct Reference Codes in CMS154v13

- code "Discharge to healthcare facility for hospice care (procedure)" ("SNOMEDCT Code (428371000124100)")
- code "Discharge to home for hospice care (procedure)" ("SNOMEDCT Code (428361000124107)")
- code "Hospice care [Minimum Data Set]" ("LOINC Code (45755-6)")
- code "Unlisted preventive medicine service" ("CPT Code (99429)")
- code "Yes (qualifier value)" ("SNOMEDCT Code (373066001)")

Note that the value set workbooks available on the Download tab of the VSAC, discussed in Section 2.2.2.1, do not include the DRCs used in measures. To obtain a separate listing of DRCs, users must select "Direct Reference Codes Specified within eCQM HQMF files Published *Month DD, YYYY*" on the Download tab of the VSAC under each reporting/performance period dropdown.

2.2.2.3 Versioning Value Sets

Value set stewards and measure developers update the VSAC regularly. All value set versions contained in the VSAC have a publication date (format: YYYYMMDD) as shown in these examples:

- 20240506
- 20240507

Users can view this version identification system by reviewing the eCQM on the VSAC website or on the exported Excel spreadsheet. They can also view the value set definition versions in Search Value Sets of the Value Set Details tab in VSAC.

Value set stewards and measure developers maintain value sets by removing or adding codes. If measure developers modify value sets while the purpose and intent remain the same, the value set version will change within the VSAC, but the OID will not. When measure developers modify value sets, and the purpose and intent of the value set change, the measure developer will assign a new OID to the value set.

3. eCQM Package

3.1 eCQM Package Naming Conventions

Measure developers create an eCQM in MADiE and export it as an eCQM package. Each eCQM package contains the following components:

- **Human-readable HTML file (.html):** File providing the eCQM content in a human-readable format directly in a web browser.
- **HQMF XML file (.xml):** File providing the description of the eCQM data and population criteria that is intended for machine processing. The format of this document includes a header and a body. The header provides metadata about the eCQM. The body contains key eCQM sections such as population criteria, data criteria, supplemental data elements, terminology, functions, and risk adjustment variables. The HQMF points to the CQL library and associated Expression Logical Model (ELM) files.
- **CQL file (.cql):** File providing the expression logic for data criteria, population criteria, and supplemental data elements. It describes the computable content in the eCQM that contains libraries that can be reused or shared between eCQMs and possibly other artifacts, such as decision support rules. In eCQM packages exported from MADiE, CQL files are located in a separate folder named "cql."
- **ELM file (.xml, .json):** File providing a machine-readable representation of the eCQM's logic in XML or JavaScript Object Notation (JSON) formats. The ELM file is intended for machine processing and provides the information necessary to automatically retrieve data from an EHR. In eCQM packages exported from MADiE, ELM files are located in a separate folder named "resources."

3.1.1 CQL Library

Libraries are the basic units of sharing CQL and consist of a foundation of CQL statements used within an eCQM. Every eCQM has a primary CQL library. The primary CQL library, referenced from HQMF, might reference other CQL libraries, such as shared libraries, that are often used in other eCQMs. The measure package includes these CQL and ELM files, which provide CQL source and ELM rendering for collections of CQL expressions used across eCQMs. The measure package also includes the JSON format of the ELM. There are several format versions of the CQL libraries, so local implementers can use the versions most appropriate to their software and data analysis tools.

3.1.2 Measure Packaging by Setting

CMS publishes multiple eCQM specification zip files annually. Each file contains the eCQMs for a specific reporting or performance period. The file names use the first year of the performance or reporting period (format: YYYY) and then setting, as shown in these examples:

- 2026-Hospital-IP-eCQM.zip
- 2026-Hospital-IP-Hybrid-eCQM.zip
- 2026-Hospital-OP-eCQM.zip
- 2026-EligibleClinician-eCQM.zip

3.1.3 CMS eCQM ID

During its development in MADiE, each eCQM receives a unique CMS eCQM ID. The header of the measure's human-readable HTML file contains the CMS ID and the eCQM Version Number. Measure developers create the CMS eCQM ID by prefacing the CMS ID with "CMS" followed by "v" and the major version number. For example, the CMS eCQM ID of the 2026 reporting period hospital - inpatient eCQM, Safe Use of Opioids - Concurrent Prescribing, is **CMS506v8**, as shown in Table 3.1.

Table 3.1. CMS eCQM Identifier

eCQM information	Value
eCQM Title	Safe Use of Opioids - Concurrent Prescribing
CMS ID	506
eCQM Major Version Number	8
CMS eCQM ID	CMS506v8

3.1.4 eCQM Zip File and Folder

An eCQM package is published as a zip file. The published zip file contains the HTML, HQMF XML, CQL, and ELM (JSON and XML) files discussed in Section 3.1. The package contains separate CQL and ELM (JSON and XML) files for each CQL library. The eCQM package is named according to the CMS eCQM ID, using the eCQM full version number, which contains the major version number, minor version number, and patch number (for example, CMS506-v8.2.000-QDM.zip).

3.1.5 Individual eCQM File Components

Table 3.2 shows example file names for eCQMs posted on the eCQI Resource Center. The eCQM specification zip, HTML, and HQMF XML file names refer to the CMS eCQM ID with the eCQM full version number. The CQL, ELM XML, and ELM JSON file names refer to the CMS eCQM ID from MADiE as well as a shortened version of eCQM title and the eCQM full version number.

Table 3.2. eCQM-Specific eCQM File Formats

File type	Standard file names	Example file names
Zip	{"CMS" + CMS ID} – {"v" + eCQM full version number} – QDM.zip	CMS506-v8.2.000-QDM.zip
HTML	{"CMS" + CMS ID} – {"v" + eCQM full version number} – QDM.html	CMS506-v8.2.000-QDM.html
HQMF XML	{"CMS" + CMS ID} – {"v" + eCQM full version number} – QDM.xml	CMS506-v8.2.000-QDM.xml
CQL	{"CMS" + CMS ID + shortened eCQM title} – {eCQM full version number}.cql	CMS506SafeUseofOpioids-8.2.000.cql
ELM XML	{"CMS" + CMS ID + shortened eCQM title} – {eCQM full version number}.xml	CMS506SafeUseofOpioids-8.2.000.xml
ELM JSON	{"CMS" + CMS ID + shortened eCQM title} – {eCQM full version number}.json	CMS506SafeUseofOpioids-8.2.000.json

3.2 Download, Extract, and Access eCQM Documents

Users can download and view an eCQM package in two ways:

- Download the eCQM zip file containing all the eCQMs for the relevant setting from the setting's eCQM Resources tab on the eCQI Resource Center
- Go to the *individual* web page associated with an eCQM on the eCQI Resource Center to view and download the specification zip file

Note: To view the XML coding, right-click to open the document with a text reader such as WordPad, Notepad, VS Code, or a third-party XML-reading software. CQL library files open in a text reader. Tools such as VS Code (with CQL plug-in) can provide syntax highlighting of CQL.

A list of eCQM Tools and Resources used in various stages of eCQM development, testing, implementation, and reporting is available on the eCQI Resource Center.

4. Understanding an eCQM Human-Readable HTML File

The eCQM human-readable format in HTML contains a header and body.

4.1 Header

The header of an eCQM provides important general information and metadata about the eCQM. It identifies the eCQM's developer and steward, its measurement period, and other details including but not limited to clinical rationale and measure intent. Appendix A includes definitions of the header component and an example of an eCQM header.

4.2 Body

The body is derived from the formal eCQM specification (CQL and HQMF). It is expected that the header narrative and the formal eCQM specification are consistent and in alignment.

- **Population criteria:** A representation of the CQL definitions specifying the populations for the eCQM. These CQL definitions typically include the set of characteristics for a given eCQM that could include information on specific age groups, diagnoses, procedures, encounters, and timing relationships (for example, the inclusion periods during which the procedures must have occurred). Population criteria might include the initial population, denominator, denominator exclusions, numerator, numerator exclusions, denominator exceptions, measure population, measure population exclusions, measure observation, and stratification. For definitions of these populations, please refer to Section 4.2.1.
- **Definitions:** Additional CQL definitions or expression logic that the population definitions might reference. A CQL definition is the basic unit of logic within the CQL library.
- **Functions:** CQL expressions performing a calculation frequently found in eCQMs to return a value. For example, measure developers usually express age calculations as functions.
- **Terminology:** A list of the value sets and DRCs used in the eCQM.
- **Data criteria (QDM data elements):** A list containing the QDM datatypes and value set names or DRC descriptions used in the eCQM. These are the building blocks used to assemble the population criteria of an eCQM.
- **Supplemental data elements:** Specific information that EHRs or health IT systems retrieve for each patient reported in the eCQM, such as race, ethnicity, payer, and sex. Measure developers may also specify additional supplemental data elements to request data for risk adjustment or population health analytics.
- **Risk adjustment variables:** Outcome eCQMs might require risk adjustment to account for the complexity of patient conditions that could affect the ability to achieve outcomes. Measure developers specify risk adjustment variables to identify these patients. Statistical models may also use the variables to revise eCQM scores based on these patient characteristics.

4.2.1 Population Criteria and Definitions

Population criteria represent eCQM characteristics for a measure, such as information on specific age groups, diagnoses, procedures, medications, and timing relationships. Population criteria consist of definitions. These concepts are described in the definition section within the human-readable format of the eCQM.

Populations by measure category (that is, ratio, proportion, and continuous variable) vary. More information on each measure category's required and permitted populations is available on the MMS Hub Measure Specification page under the Specifications by Measure Category tab.

A measure may define the following populations:[7]

- **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 rate, proportion, or 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. Continuous variable measures do not have a denominator, but instead define a measure population.
- **Denominator exclusions (DENEX):** In proportion measures, a patient or episode that measured entities remove from the denominator before determining if numerator criteria are met. In ratio measures, because the denominator and numerator are distinct, episodes that meet the denominator exclusions criteria will be excluded only from the denominator population.
- **Numerator (NUMER):** The upper portion of a fraction used to calculate a rate, proportion, or ratio. 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) or initial population (for ratio measures). A 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.

[7] Except for measure population and measure population exclusions, all definitions are available on the eCQI Resource Center website at https://ecqi.healthit.gov/glossary.

- **Numerator exclusions (NUMEX):** Defines an instance that measured entities should not include in the numerator data. Measure developers use numerator exclusions only in ratio and proportion measures.
- **Measure population (MSRPOPL):** Used only in continuous variable measures, 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):** Used only in continuous variable measures, a subset of the measure population the measure observation calculations do not use.
- **Measure observations:** Used only in ratio and continuous variable measures, measure observations describe how to evaluate performance—for example, the sum of denominator-eligible hospitalization days during the measurement period. Measure observations may be associated with the Denominator (Denominator Observations) or Numerator (Numerator Observations) in ratio measures.

For example, Figure 4.1 defines the initial population of CMS122v13, Diabetes: Glycemic Status Assessment Greater Than 9%:

- Patients 18 to 75 years of age by the end of the measurement period with a visit during the measurement period
- Patients who have a diagnosis of diabetes identified any time up to the end of the measurement period

Figure 4.1. Initial Population Criteria in CMS122v13

```
Initial Population
    AgeInYearsAt(date from
      end of "Measurement Period"
    )in Interval[18, 75]
      and exists ( "Qualifying Encounters" )
      and exists ( ["Diagnosis": "Diabetes"] Diabetes
          where Diabetes.prevalencePeriod overlaps day of "Measurement Period"
      )
```

Note that in the example shown in Figure 4.1, CQL uses common linking operators and timing phrases such as “exists.” Common linking operators and timing phrases found within CQL expressions include the following:

> and, not, or, is, is not, starts/ends, during, before, on or before/after, same or before/after, with/without, overlaps, count, sort, null, is true/false, greater/less, same as, equal, exists, intersects, sort, first/last, return, let, where, union, intersect, except, includes

Definitions. The CQL expression also uses definitions, which are common clauses of data elements and their interrelationships. The definition title, displayed in quotation marks, is a human-readable name enabling the eCQM to reference expressions without having to repeat all the logic each time. Each eCQM has a definition section containing a definition title followed by the expression logic used to characterize it.

Figure 4.2 shows a simple definition of "Initial Population," describing all patients included in the denominator. As noted in Figure 4.1, the definition of "Initial Population" specifies the content of the definition of "Initial Population."

Figure 4.2. Example of Population Criteria Definition

◢ Denominator
"Initial Population"

Note the definition of "Initial Population" includes other definitions such as "Qualifying Encounters" (see Figure 4.1). The user should review the definition section of the specification to determine what each definition includes. In the human-readable HQMF, definitions are in alphabetical order by the definition name.

Aliases. Aliases are words or easily understood abbreviations that help describe logic statements and are meant to reduce their complexity. A measure developer can assign an alias to an expression in CQL and reference that same concept elsewhere in the query using the alias, reducing complexity rather than repeating the entire expression each time it is needed. In Figure 4.3, using an example from CMS826v2, Hospital Harm - Pressure Injury, the eCQM adds the alias "SkinExam" to the QDM data element ["Physical Exam, Performed": "Physical findings of Skin"]. As a result, when the eCQM expresses how to relate the timing of the skin exams in this query, it can use the alias instead of repeating the entire expression to which it refers.

Attributes. QDM defines a set of allowable attributes for each QDM datatype. An attribute provides specific details about a QDM data element, such as timing, results, and locations. In Figure 4.3, "Physical Exam, Performed" is the QDM datatype, and it includes several attributes, including the *relevantPeriod* timing. QDM defines *relevantPeriod* as the time between the start of an action to the end of an action, also known as a time interval. The CQL references attributes using a period between the alias for the QDM data element and its attribute.

Figure 4.3. Example of QDM Data Element Expressed in CQL

```
with ["Physical Exam, Performed": "Physical findings of Skin"] SkinExam
    such that Global."NormalizeInterval" ( SkinExam.relevantDatetime, SkinExam.relevantPeriod )
    starts 72 hours or less on or after start of Global."HospitalizationWithObservation" (
    EncounterInpatient )
      and Global."NormalizeInterval" ( SkinExam.relevantDatetime, SkinExam.relevantPeriod ) starts
      during Global."HospitalizationWithObservation" ( EncounterInpatient )
```

Figure 4.4, also from CMS826v2, Hospital Harm - Pressure Injury, presents the final example of the completed QDM data element in the Data Criteria (QDM Data Elements) section of the eCQM, which lists the DRC or value set the QDM datatype requires. The QDM data element ["Physical Exam, Performed": "Physical findings of Skin"] uses the "Physical findings of Skin" DRC. Subsection 2.2.2 provides a high-level description of the VSAC, which contains all the eCQM value sets and DRCs.

Figure 4.4. Example of QDM Data Element Listed in Data Criteria (QDM Data Elements) Section

Data Criteria (QDM Data Elements)

- "Physical Exam, Performed: Physical findings of Skin" using "Physical findings of Skin (LOINC Code 8709-8)"

4.2.2 Functions

Functions are CQL expressions that perform a calculation frequently found in eCQMs. Rather than repeating common calculations in each eCQM, a measure developer can express the logic to access a library of functions and include selected functions as part of the eCQM logic. CQL expressions contain functions that perform a variety of calculations. For example, as Figure 4.5 shows, to avoid restating logic to include all use cases for date time points around a data element in each eCQM, the measure developer uses the function "NormalizeInterval" from a global shared library.

Figure 4.5. Example of CQL Function

```
◢ Numerator
    exists ["Intervention, Performed": "Counseling for Nutrition"] NutritionCounseling
      where Global."NormalizeInterval" ( NutritionCounseling.relevantDatetime,
    NutritionCounseling.relevantPeriod ) during "Measurement Period"
```

Some functions are global functions and exist in the global shared library so that they can be easily used across eCQMs. Figure 4.6 depicts the "NormalizeInterval" function as an example of a global calendar function from the global shared library.

Figure 4.6. Example of CQL Global Function

```
◢ Global.NormalizeInterval(pointInTime DateTime, period Interval<DateTime>)
    if pointInTime is not null then Interval[pointInTime, pointInTime]
      else if period is not null then period
      else null as Interval<DateTime>
```

4.2.2.1 Libraries

Measure authors can share definitions or functions across eCQMs via shared libraries. Sharing can occur locally—that is, for use across several eCQMs—or globally through the global shared library for use across all eCQMs. Figure 4.6 shows the referenced function of "Global.NormalizeInterval()" from the global shared library, CQMCommonQDM. Figure 4.7 shows the referenced definition of "Hospice.Has Hospice Services," which determines whether the patient is receiving hospice care, from the local shared HospiceQDM library.

Figure 4.7. Example of Population Criteria Using a Definition from a Local Shared Library

```
◢ 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"
            )
```

4.2.3 Terminology and Data Criteria (QDM Data Elements)

The Terminology section provides a complete list of value sets and DRCs used in an eCQM, including the value set name with its unique OID. For DRCs, the list contains the code, code system version, and the OID of the code system that each DRC uses.

The Data Criteria (QDM Data Elements) section shows how to assemble the population criteria of an eCQM. Data criteria consist of QDM data elements and the values or value sets that define them. The Data Criteria (QDM Data Elements) section of the human-readable HTML file lists alphabetically all unique QDM data elements, with corresponding value sets, that an eCQM uses.

QDM also defines additional information about a data element that an eCQM might contain, referred to as attributes. All QDM datatypes have a code attribute that an eCQM expression must bind to the terminology, either a value set or a DRC. eCQMs represent other QDM attributes in a "where" clause to further narrow the instances of QDM data elements within a population. For example, a *relevantPeriod* attribute could provide the time interval for a hospital admission and discharge. CQL logic can assess whether this *relevantPeriod* is within the measurement period.

CQL expressions reference the attributes of QDM data elements to further refine and restrict the criteria. Sometimes these criteria involve quantities, such as restricting lab results to a certain threshold. In other cases, the attributes reference values or codes, such as indicating that the *negationRationale* must be a value from the "Patient Refusal" value set. When the CQL uses values to reference attributes, the value sets display in the Terminology section and not in the Data Criteria (QDM Data Elements) section, which is limited to values or value sets referenced with QDM datatypes. Attributes include concepts such as *result, negationRationale,* and *severity*, all of which provide further context for the data element expressed with the QDM datatype.

For example, CMS138v13, Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention, includes all patients receiving a tobacco screening in its numerator. To identify a tobacco screening, the logic looks for an assessment performed during the measurement period. The result is a QDM data element of ["Assessment, Performed": "Tobacco Use Screening"]. Figure 4.8 shows an example of this CQL expression.

Figure 4.8. Example of a CQL Expression for a Tobacco Screening

Most Recent Tobacco Use Screening Indicates Tobacco User

```
( Last(["Assessment, Performed": "Tobacco Use Screening"] TobaccoUseScreening
    where Global."NormalizeInterval"(TobaccoUseScreening.relevantDatetime,
TobaccoUseScreening.relevantPeriod)during day of "Measurement Period"
    sort by start of Global."NormalizeInterval"(relevantDatetime, relevantPeriod)
)) MostRecentTobaccoUseScreening
  where MostRecentTobaccoUseScreening.result in "Tobacco User"
```

The *result* attribute references a value set "Tobacco User." However, the Data Criteria (QDM Data Elements) section does not include the value set reference, because the *result* attribute (and associated value set) is not in the CQL retrieve filter. In this case, a measured entity can consider the Data Criteria (QDM Data Elements) section as criteria used in the retrieve filter. The value set reference appears only in the eCQM Terminology section.

4.2.4 Supplemental Data Elements

All CMS eCQMs include a supplemental data element section. This section requests that a measured entity retrieve specific information for each patient reported in the eCQM. The report recipient can use this information for risk adjustment or population analytics, but the supplemental elements are not included in the calculation as part of the basic measure logic. Figure 4.9 shows an example of the supplemental data element section with the four elements that CMS requires (ethnicity, payer, race, and sex). Individual eCQMs might include additional supplemental data elements. For example, hybrid measures and risk-adjusted measures identify the list of additional patient data that is required in the Supplemental Data Element section of the eCQM.

Figure 4.9. Supplemental Data Element Section of an eCQM

Supplemental Data Elements

SDE Ethnicity

["Patient Characteristic Ethnicity": "Ethnicity"]

SDE Payer

["Patient Characteristic Payer": "Payer Type"]

SDE Race

["Patient Characteristic Race": "Race"]

SDE Sex

["Patient Characteristic Sex": "Federal Administrative Sex"]

4.2.5 Reporting Stratification

Measure developers might define reporting strata; that is, variable groupings a measured entity should include in the eCQM report. For example, they might report different rates by age or by type of intensive care unit in a facility.

The eCQM human-readable document (HTML) always includes a Stratification section. If an eCQM does not have reporting strata defined, the section displays "None" by default. If an eCQM contains reporting stratifications, the section lists each of the reporting strata under its own heading, as shown in Figure 4.10 (example from the eligible clinician measure CMS155v13, Weight Assessment and Counseling for Nutrition and Physical Activity for Children/Adolescents).

Figure 4.10. Reporting Stratification

(a) Stratification Section in Header

Stratification	Report a total score, and each of the following strata: Stratum 1 - Patients age 3–11 years at the end of the measurement period Stratum 2 - Patients age 12–17 years at the end of the measurement period

(b) Stratification Section in CQL Logic Definitions

Stratification 1

```
AgeInYearsAt(date from
  end of "Measurement Period"
)in Interval[3, 11]
```

Stratification 2

```
AgeInYearsAt(date from
  end of "Measurement Period"
)in Interval[12, 17]
```

4.2.6 Risk Adjustment Variables

Outcome measures might require risk adjustment to account for the complexity of patient conditions that could affect the outcomes. Risk adjustment variables serve to identify these patients. An eCQM report receiver may use variables in statistical models to revise eCQM scores to reflect these patient characteristics. The eCQM will express risk adjustment variables and measured entities will ensure retrieval of such elements from existing clinical data. The measure developer will include risk adjustment methodology as an attachment or link in the eCQM header to describe how to adjust scores using the variables. Data that measured entities use as risk adjustment variables are submitted to the receiving system in a manner similar to supplemental data elements noted in Section 4.2.4.

4.2.7 Measure Observations

Only ratio and continuous variable measures use measure observations. Measure observations describe how to evaluate performance—for example, the sum of denominator-eligible hospitalization days during the measurement period. Measure observations may also be associated with the numerator or denominator.

Figure 4.11 shows an example of measure observation logic referencing the "DenominatorObservations" function located in the Functions section of CMS871v4, Hospital Harm - Severe Hyperglycemia.

Figure 4.11. Measure Observation Example

```
DenominatorObservations(QualifyingEncounter "Encounter, Performed")
  singleton from ( "Days with Hyperglycemic Events" EncounterWithEventDays
        where EncounterWithEventDays.encounter = QualifyingEncounter
        return Count(EncounterWithEventDays.eligibleEventDays)
    )
```

5. Connect for Assistance

For questions related to eCQM implementation specifications, logic, data elements, standards, or tools, use the eCQM Issue Tracker in the Assistant Secretary for Technology Policy/Office of the National Coordinator for Health IT (ASTP/ONC) Project Tracking System (Jira) on the ASTP/ONC Project Tracking System website.

Version History

Version	Date	Author/owner	Description of change
4.0	May 4, 2018	CMS	Initial updated draft for comments
5.0	May 2019	CMS	Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout. Revised text based on input from interested parties and external reviewers. Added Section 2.2.3.2, Direct Reference Codes.
6.0	May 2020	CMS	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 2021	CMS	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 2022	CMS	Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout. Revised text based on input from interested parties and external reviewers.
9.0	May 2023	CMS	Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout. Revised text based on input from interested parties and external reviewers.
10.0	May 2024	CMS	Updated measure examples, figures, hyperlinks, and versions of standards referenced throughout. Updated ratio measure specific information. Updated to active voice. Revised text based on input from interested parties and external reviewers.
11.0	May 2025	CMS	Updated measure examples, figures, hyperlinks, and versions of standards throughout. Updated definitions to align with those on the MMS Hub. Updated tooling references from MAT and Bonnie to MADiE.

Appendix A. Sample eCQM Header

This appendix presents header component definitions in the order shown in the sample header in Figure A.1, which appears after this list of definitions.

eCQM Title: The title of the eCQM.

CMS ID: MADiE automatically generates a unique CMS ID number.

eCQM Version Number: A number used to indicate the version of the eCQM. The combination of the CMS ID and the major version portion of the eCQM version number creates the CMS eCQM ID.

CBE Number: The eCQM header includes a consensus-based entity (CBE) number if the eCQM has received endorsement. Users may cross-reference the assigned CBE number with the CBE's Submission Tool and Repository (STAR) Measure Database to verify measure endorsement status.

GUID: Represents the globally unique identifier (GUID) for an eCQM. MADiE automatically generates this field. The GUID does not change from year to year when eCQM specifications are updated. Please note that the HQMF uses the tag "setld" for what the human readable HTML labels as "GUID."

Measurement Period: The time period for which the eCQM applies.

Measure Steward: The measure steward is an individual or organization that owns a measure and is responsible for overseeing its continued maintenance under a specific program. The measure steward is often the same as the measure developer for a given measure, but that is not always the case. When the measure steward and measure developer of a measure are distinct entities, the steward is responsible for approving, rejecting, or publishing changes submitted by the developer. Measure stewards also serve as the point of contact for parties interested in a given measure (e.g., a medical specialty society or federal health agency). Please note that the HQMF refers to the measure steward as "custodian" and the measure developer as "author."

Measure Developer: The measure developer is an individual or organization that is responsible for the development, implementation, and maintenance of a measure, which involves creating, editing, and submitting measures to stewards for approval.

Endorsed By: The organization that endorsed the eCQM through a consensus-based process.

Description: A general description of the eCQM's intent.

Copyright: Identifies the organization or organizations that own the intellectual property that the eCQM or its contents represent.

Disclaimer: Disclaimer information for the eCQM.

Measure Scoring: Indicates how a measured entity should perform the calculation for the eCQM (for example, proportion, continuous variable, or ratio).

Measure Type: Indicates what the eCQM is measuring, such as a structure, process, or outcome. The MMS Hub Glossary contains definitions of the different measure types.

Stratification: Describes the strata that a measured entity should use to evaluate the eCQM. There are several bases for stratification, including different age groupings within the population described in the eCQM; a specific condition, discharge location, or both; and different locations within a facility.

Risk Adjustment: The method of adjusting for clinical severity and conditions present at the start of care that can influence patient outcomes for making valid comparisons of outcome measures across measured entities. Risk adjustment indicates whether an eCQM is subject to a statistical process for reducing, removing, or clarifying the influences of confounding factors to allow more useful comparisons.

Rate Aggregation: Describes how to combine information calculated based on logic in each of several populations into one summarized result. It can also describe how to risk adjust the data based on supplemental data elements described in the eCQM.

Rationale: Succinct statement of the need for the eCQM. Usually includes statements pertaining to importance criteria, such as impact, gap in care, and evidence.

Clinical Recommendation Statement: Summary of relevant clinical guidelines or other clinical recommendations supporting the eCQM.

Improvement Notation: Information on whether an increase or decrease in score is the preferred result (for example, increased score indicates improvement OR decreased score indicates improvement). A text explanation may also be provided, such as in CMS334v6, Cesarean Birth.

Reference(s): Identifies bibliographic citations or references to clinical practice guidelines, sources of evidence, or other relevant materials supporting the intent and rationale of the eCQM.

Definition: Description of individual terms provided as needed.

Guidance: Enables measure developers to provide additional guidance so implementers can more easily interpret and implement components of the eCQM.

Transmission Format: To be determined (TBD).

Initial Population: Refers to all patients a specific eCQM expects a measured entity to evaluate. The initial population shares a common set of specified characteristics, such as age, diagnoses, diagnostic and procedure codes, and enrollment periods.

Denominator: Describes the population that individual eCQM has evaluated. The target population that the denominator defines can be the same as the initial population or it can be a subset of the initial population to further constrain the population for the measure.

Denominator Exclusions: Refer to criteria resulting in removal from the denominator before calculating the numerator. An exclusion means the numerator event is not applicable. One example is screening mammography for a woman who had a bilateral mastectomy. The goal of denominator exclusion criteria is to have a population or sample with a similar profile in terms of meeting the numerator criteria.

Numerator: Describes the process, condition, event, or outcome that satisfies the eCQM focus or intent.

Numerator Exclusions: Define elements that should not be included in the numerator data. Only proportion and ratio measures include numerator exclusion criteria.

Denominator Exceptions: Refers to criteria resulting in removal from the denominator after calculating the numerator. An exception means the numerator event is applicable but not clinically appropriate. One example is not performing a suicide screening for a patient in an acute medical situation.

Supplemental Data Elements: CMS defines four required Supplemental Data Elements (payer, ethnicity, race, and sex), which are variables used to aggregate data into various subgroups.

Comparing results across strata can identify places where disparities exist or areas in which exposing differences in results is necessary. eCQMs may include additional supplemental data elements required for risk adjustment or other purposes of data aggregation.

Figure A.1. eCQM Header for CMS506v8, Safe Use of Opioids - Concurrent Prescribing

eCQM Title	**Safe Use of Opioids - Concurrent Prescribing**		
CMS ID	506	**eCQM Version Number**	8.2.000
CBE Number	3316e	**GUID**	33b40c00-909a-4490-8093-999fbcdc3480
Measurement Period	January 1, 2026 through December 31, 2026		
Measure Steward	Centers for Medicare & Medicaid Services (CMS)		
Measure Developer	Mathematica		
Endorsed By	CMS Consensus Based Entity		
Description	Proportion of inpatient hospitalizations for patients 18 years of age and older prescribed, or continued on, two or more opioids or an opioid and benzodiazepine concurrently at discharge		
Copyright	Limited proprietary coding is contained in the Measure specifications for user convenience. Users of proprietary code sets should obtain all necessary licenses from the owners of the code sets. Mathematica disclaims all liability for use or accuracy of any third-party codes contained in the specifications. CPT(R) contained in the measure specifications is copyright 2004-2024 American Medical Association. LOINC(R) copyright 2004-2024 Regenstrief Institute, Inc. This material contains SNOMED Clinical Terms(R) (SNOMED CT[R]) copyright 2004-2024 International Health Terminology Standards Development Organisation. ICD-10 copyright 2024 World Health Organization. All Rights Reserved.		
Disclaimer	These performance measures are not clinical guidelines, do not establish a standard of medical care, and have not been tested for all potential applications. THE MEASURES AND SPECIFICATION ARE PROVIDED AS IS WITHOUT WARRANTY OF ANY KIND. Due to technical limitations, registered trademarks are indicated by (R) or [R] and unregistered trademarks are indicated by (TM) or [TM].		
Measure Scoring	Proportion		
Measure Type	Process		
Stratification	None		
Risk Adjustment	None		
Rate Aggregation	None		
Rationale	Unintentional opioid overdose fatalities have become a major public health concern in the United States (Rudd, Aleshire, Zibbel, & Gladden, 2016). Reducing the number of unintentional overdoses has become a priority for numerous federal organizations including, but not limited to, the Centers for Disease Control and Prevention (CDC), the Federal Interagency Workgroup for Opioid Adverse Drug Events, and the Substance Abuse and Mental Health Services Administration. Concurrent prescriptions of opioids or opioids and benzodiazepines places patients at a greater risk of unintentional overdose due to the increased risk of respiratory depression (Dowell, Haegerich, & Chou, 2016; Dowell, Ragan,		

	Jones, Baldwin, & Chou, 2022). An analysis of national prescribing patterns shows that more than half of patients who received an opioid prescription in 2009 had filled another opioid prescription within the previous 30 days (National Institute on Drug Abuse, 2011). Studies of multiple claims and prescription databases have shown that between 5%-15% of patients receive concurrent opioid prescriptions and 5%-20% of patients receive concurrent opioid and benzodiazepine prescriptions across various settings (Liu et al., 2013; Mack et al., 2015, Park et al., 2015). Patients who have multiple opioid prescriptions have an increased risk for overdose (Jena et al., 2014). Rates of fatal overdose are ten times higher in patients who are co-dispensed opioid analgesics and benzodiazepines than opioids alone (Dasgupta et al., 2015). The number of opioid overdose deaths involving benzodiazepines increased 14% on average each year from 2006 to 2011, while the number of opioid analgesic overdose deaths not involving benzodiazepines did not change significantly (Jones & McAninch, 2015). Furthermore, concurrent use of benzodiazepines with opioids was prevalent in 31%-51% of fatal overdoses (Dowell, Haegerich, & Chou, 2016). One study found that eliminating concurrent use of opioids and benzodiazepines could reduce the risk of opioid overdose-related emergency department (ED) and inpatient visits by 15% and potentially could have prevented an estimated 2,630 deaths related to opioid painkiller overdoses in 2015 (Sun, Dixit, Humphreys, Darnall, & Mackey, 2017). A study on The Opioid Safety Initiative in the Veterans Health Administration (VHA), which includes an opioid and benzodiazepine concurrent prescribing measure that this measure is based on, was associated with a decrease of 20.67% overall and 0.86% patients per month (781 patients per month) receiving concurrent benzodiazepine with an opioid among all adult VHA patients who filled outpatient opioid prescriptions from October 2012 to September 2014 (Lin, Bohnert, Kerns, Clay, Ganoczy, & Ilgen, 2017). Adopting a measure that calculates the proportion of patients with two or more opioids or opioids and benzodiazepines concurrently has the potential to reduce preventable mortality and reduce the costs associated with adverse events related to opioid use by (1) encouraging providers to identify patients with concurrent prescriptions of opioids or opioids and benzodiazepines and (2) discouraging providers from prescribing two or more opioids or opioids and benzodiazepines concurrently.
Clinical Recommendation Statement	The CDC Clinical Practice Guideline for Prescribing Opioids for Pain — United States, 2022 recommends that clinicians should: - "[Use strategies minimizing] opioid use…for both opioid-naïve and opioid-tolerant patients with acute pain when possible. If patients receiving long-term opioid therapy require additional medication for acute pain, nonopioid medications should be used when possible." - "Use particular caution when prescribing opioid pain medication and benzodiazepines concurrently." - "Review increased risks for respiratory depression when opioids are taken with benzodiazepines, other sedatives, alcohol, nonprescribed or illicit drugs (e.g., heroin), or other opioids (see Recommendations 8 and 11)" - "Closely monitor patients who are unable to taper and who continue on high-dose or otherwise high-risk opioid regimens (e.g., opioids prescribed concurrently with benzodiazepines) and should work with patients to mitigate overdose risk (e.g., by providing overdose education and naloxone) (see Recommendation 8)." - "Discuss information from the PDMP with the patient and confirm that the patient is aware of any additional prescriptions." - "Discuss safety concerns, including increased risk for respiratory depression and overdose, with patients found to be receiving overlapping prescription opioids from multiple clinicians who are not coordinating the patient's care or patients who are receiving medications that increase risk when combined with opioids (e.g., benzodiazepines) (see Recommendation 11), and offer naloxone (see Recommendation 8)."

	- "Discuss safety concerns with other clinicians who are prescribing controlled substances for the patient. Ideally, clinicians should first discuss concerns with the patient and inform them that they plan to coordinate care with their other clinicians to improve the patient's safety." In addition to the 2022 CDC Clinical Practice Guideline for Prescribing Opioids for Pain, opioid prescribing guidelines issued by various state agencies and professional societies for various settings agree with the recommendation to avoid concurrently prescribing opioids (American Academy of Emergency Medicine (AAEM), 2013; and Washington Agency Medical Directors' Group (WAMDG), 2015), and opioids and benzodiazepines (WAMDG, 2015; American Society of Interventional Pain Physicians (ASIPP), 2012;, and New York City Department Of Health and Mental Hygiene (NYC DPOMH), 2013) whenever possible as the combination of these medications may potentiate opioid-induced respiratory depression.
Improvement Notation	Decreased score indicates improvement
Reference	Reference Type: Citation Reference Text: 'American Academy of Emergency Medicine (AAEM). (2013). Emergency department opioid-prescribing guidelines for the treatment of non-cancer-related pain. Retrieved from https://www.aaem.org/UserFiles/file/Emergency-Department-Opoid-Prescribing-Guidelines.pdf'
Reference	Reference Type: Citation Reference Text: 'American Society of Interventional Pain Physicians (ASIPP). (2012). Guidelines for responsible opioid prescribing in chronic non-cancer pain; Part 2-guidance. Retrieved from https://pubmed.ncbi.nlm.nih.gov/22786449/'
Reference	Reference Type: Citation Reference Text: 'Dasgupta, N., Funk, M. J., Proescholdbell, S., Hirsch, A., Ribisl, K. M., & Marshall, S. (2015). Cohort study of the impact of high-dose opioid analgesics on overdose mortality. Pain Medicine. 'https://doi.org/10.1111/pme.12907''
Reference	Reference Type: Citation Reference Text: 'Dowell D., Ragan K., Jones C., Baldwin G., & Chou R. (2022). CDC Clinical Practice Guideline for Prescribing Opioids for Pain — United States, 2022. Morbidity and Mortality Weekly Report (MMWR) Recommendations and Reports, 71(No. RR-3):1–95. DOI: http://dx.doi.org/10.15585/mmwr.rr7103a1'
Reference	Reference Type: Citation Reference Text: 'Dowell, D., Haegerich, T., & Chou, R. (2016). CDC guideline for prescribing opioids for chronic pain—United States, 2016. Morbidity and Mortality Weekly Report (MMWR) Recommendations and Reports, 65(No. RR-1):1-49. 'DOI: https://dx.doi.org/10.15585/mmwr.rr6501e1''
Reference	Reference Type: Citation Reference Text: 'Jena, A. B., Goldman, D., Weaver, L., & Karaca-Mandic, P. (2014). Opioid prescribing by multiple providers in Medicare: Retrospective observational study of insurance claims. BMJ, 348, g1393. DOI: 10.1136/bmj.g1393'
Reference	Reference Type: Citation

	Reference Text: 'Jones, C. M., & McAninch, J. K. (2015). Emergency department visits and overdose deaths from combined use of opioids and benzodiazepines. American Journal of Preventive Medicine, 49(4), 493-501. 'DOI: 10.1016/j.amepre.2015.03.040''
Reference	Reference Type: Citation Reference Text: 'Lin, L. A., Bohnert, A. S. B., Kerns, R. D., Clay, M. A., Ganoczy, D., & Ilgen, M. A. (2017). Impact of the opioid safety initiative on opioid-related prescribing in veterans. Pain, 158(5), 833–839. 'DOI: 10.1097/j.pain.0000000000000837''
Reference	Reference Type: Citation Reference Text: 'Liu, Y., Logan, J., Paulozzi, L., et al. (2013). Potential misuse and inappropriate prescription practices involving opioid analgesics. American Journal of Managed Care, 19(8), 648–665. Retrieved from http://www.ajmc.com/journals/issue/2013/2013-1-vol19-n8/Potential-Misuse-and-Inappropriate-Prescription-Practices-Involving-Opioid-Analgesics/'
Reference	Reference Type: Citation Reference Text: 'Mack, K., Zhang, K., Paulozzi, L., & Jones, C. (2015). Prescription practices involving opioid analgesics among Americans with Medicaid, 2010. Journal of Health Care for the Poor and Underserved, 26(1), 182–198. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4365785'
Reference	Reference Type: Citation Reference Text: 'National Institute on Drug Abuse. (2011). Analysis of opioid prescription practices finds areas of concern. Retrieved from https://www.nih.gov/news-events/news-releases/analysis-opioid-prescription-practices-finds-areas-concern'
Reference	Reference Type: Citation Reference Text: 'New York City (NYC) Department of Health and Mental Hygiene (NYC DOHMH). (2013). Opioid prescribing resource for emergency department. Retrieved from https://www1.nyc.gov/site/doh/providers/health-topics/opioid-prescribing-resources-for-emergency-departments.page'
Reference	Reference Type: Citation Reference Text: 'Park, T. W., Saitz, R., Ganoczy, D., Ilgen, M. A., & Bohnert, A. S. (2015). Benzodiazepine-prescribing patterns and deaths from drug overdose among U.S. veterans receiving opioid analgesics: Case-cohort study. BMJ, 350(h2698). 'DOI: 10.1136/bmj.h2698''
Reference	Reference Type: Citation Reference Text: 'Rudd, R., Aleshire, N., Zibbell, J., & Gladden, M. (2016). Increases in drug and opioid overdose deaths—United States, 2000–2014. Morbidity and Mortality Weekly Report, 64(50), 1378–1382. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6450a3.htm'
Reference	Reference Type: Citation Reference Text: 'Sun, E., Dixit, A., Humphreys, K., Darnall, B., Baker, L., & Mackey, S. (2017). Association between concurrent use of prescription opioids and benzodiazepines and overdose: Retrospective analysis. BMJ, 356(j760). Retrieved from http://www.bmj.com/content/356/bmj.j760'

Reference	Reference Type: Citation Reference Text: 'Washington Agency Medical Directors' Group (WAMDG). (2015). Interagency guideline on prescribing opioids for pain, Part II: Prescribing opioids in the acute and subacute phase. Retrieved from http://www.agencymeddirectors.wa.gov/Files/2015AMDGOpioidGuideline.pdf'
Definition	For the purpose of this measure, the following are defined as: - Opioid: Schedule II, III and IV Opioid Medications that do not include naloxone. - Benzodiazepine: Schedule IV benzodiazepine medications. - Medications for Opioid Use Disorder: Methadone, buprenorphine and buprenorphine in combination with naloxone. - Prescribed: The intent of the measure is to capture opioid and/or benzodiazepine medications continued or ordered at discharge - Numerator criteria: Two or more unique orders for opioids, or an opioid and benzodiazepine at discharge
Guidance	Clinician judgement, clinical appropriateness, or both may indicate concurrent prescribing of two unique opioids or an opioid and benzodiazepine is medically necessary, thus the measure is not expected to have a zero rate. New or continuing opioid and benzodiazepine medications are included with the use of the QDM "Medication, Discharge" datatype. This datatype indicates medications that should be taken by or given to the patient after being discharged from an inpatient encounter, which could include previously or newly prescribed medications. The definition of this datatype is located on eCQI Resource Center. Inpatient hospitalizations with discharge medications of an opioid or benzodiazepine prescription should be included in the initial population. Inpatient hospitalizations with discharge medications of two or more opioids or an opioid and benzodiazepine resulting in concurrent therapy at discharge should be included in the numerator. Each benzodiazepine and opioid included on the medication discharge list is considered a unique prescription. The denominator population includes patients with inpatient hospitalizations and patients from Acute Hospital Care at Home programs, who are treated and billed as inpatients but receive care in their home. This eCQM is an episode-based measure. An episode is defined as each inpatient hospitalization or encounter that ends during the measurement period. This version of the eCQM uses QDM version 5.6. Please refer to the eCQI Resource Center (https://ecqi.healthit.gov/qdm) for more information on the QDM.
Transmission Format	TBD
Initial Population	Inpatient hospitalizations that end during the measurement period, where the patient is 18 years of age and older at the start of the encounter and prescribed one opioid and/or benzodiazepine at discharge
Denominator	Equals Initial Population

Denominator Exclusions	Inpatient hospitalizations where patients have cancer pain that begins prior to or during the encounter or are ordered or are receiving palliative or hospice care (including comfort measures, terminal care, and dying care) during the hospitalization or in an emergency department encounter or observation stay immediately prior to hospitalization, patients receiving medication for opioid use disorder (OUD) with active OUD diagnosis or Opioid Medication Assisted Treatment (MAT), patients with sickle cell disease, patients discharged to another inpatient care facility or left against medical advice, and patients who expire during the inpatient stay
Numerator	Inpatient hospitalizations where the patient is prescribed two or more opioids or an opioid and benzodiazepine at discharge
Numerator Exclusions	None
Denominator Exceptions	None
Supplemental Data Elements	For every patient evaluated by this measure also identify payer, race, ethnicity and sex

Acronyms

ANSI	American National Standards Institute
ASTP	Assistant Secretary for Technology Policy
CBE	consensus-based entity
CMS	Centers for Medicare & Medicaid Services
CPT	Current Procedural Terminology
CQL	Clinical Quality Language
DRC	direct reference code
eCQI	electronic clinical quality improvement
eCQM	electronic clinical quality measure
ED	emergency department
EHR	electronic health records
ELM	Expression Logical Model
GUID	globally unique identifier
Health IT	health information technology
HL7®	Health Level Seven International®
HQMF	Health Quality Measure Format
HTML	Hypertext Markup Language
ICD-10-CM	International Classification of Diseases, Tenth Revision, Clinical Modification
JSON	JavaScript Object Notation
LOINC	Logical Observation Identifiers Names and Codes
MADiE	Measure Authoring Development Integrated Environment
MAT	Measure Authoring Tool
MMS	Measures Management System
OID	object identifier
ONC	Office of the National Coordinator for Health Information Technology
OQR	Outpatient Quality Reporting
QDM	Quality Data Model
SNOMED CT	Systematized Nomenclature of Medicine, Clinical Terms
VSAC	Value Set Authority Center
XML	Extensible Markup Language