



eCQM 101 - Getting Started with Electronic Clinical Quality Measures (eCQMs) for Quality Reporting Programs Resources

Updated May 2022

eCQM 101 Overview

- What resources are helpful to successfully implement eCQMs?
- What resources are available to help me test the eCQMs?
- Where do I find key resources to help me understand eCQMs?

**What resources are helpful to
successfully implement eCQMs?**

Key eCQM Materials

- [Guide for Reading eCQMs](#) provides a detailed overview of reading eCQMs and eCQM-related documents.
- [eCQM Logic and Implementation Guidance document](#) provides guidance for understanding, using, and implementing eCQMs.
- [Implementation Checklist](#)
- Measure Specific
 - Technical Release Notes
 - Value Sets and Direct Reference Codes in the Value Set Authority Center (VSAC)
 - eCQM Flows

eCQM Implementation Checklist Snippet

eCQM Implementation Checklist

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The Centers for Medicare & Medicaid Services (CMS) requires an [eligible professional](#) (EP), [eligible clinician](#), [eligible hospital](#) (EH) or [critical access hospital](#) (CAH) to use the most current version of the [eCQMs](#) for quality reporting programs.

The [Preparation and Implementation Checklists](#) (PDF) assume that a health care practice/organization has determined which measures to report on. It provides the necessary technical steps [health information technology](#) (IT) developers, implementers and health care organizations must take to update their systems and processes with the eCQM Annual Update for the upcoming reporting and performance periods. The most recent eCQM Annual Update should be applied to your system for use in CMS electronic quality reporting.

Preparation Checklist


















- 1) [Sign up for a Unified Medical Language System](#) (UMLS) [account](#)
- 2) [Sign up for an ONC Project Tracking Jira account](#)
- 3) [Sign up for eCQM page change notifications on the eCQI Resource Center](#)
- 4) [Review the code system versions used in the eCQM specification for the upcoming reporting/performance year](#)
- 5) [Review the standards, tools, and documents used to support the eCQM specification for the upcoming reporting/performance year](#)

Implementation Checklist

- 1) [Access the appropriate eCQM Annual Update](#)

<https://ecqi.healthit.gov/ecqm-implementation-checklist>

Technical Release Notes (TRNs)

<input type="text"/>		Apply
2022 Reporting Period Eligible Hospital / Critical Access Hospital Resources		
For Use 	eCQM Implementation Resources	
2022 Q1-Q4	Implementation Checklist eCQM Annual Update 	
2022 Q1-Q4	Guide for Reading eCQMs v7.0 (PDF) 	
2022 Q1-Q4	Hospital Quality Reporting Table of eCQMs (PDF) 	May 2021
2022 Q1-Q4	eCQM Specifications for Hospital Quality Reporting. (ZIP) 	May 2021
2022 Q1-Q4	eCQM Value Sets  	May 2021
2022 Q1-Q4	eCQM Direct Reference Codes List  	May 2021
2022 Q1-Q4	Binding Parameter Specification (BPS)  	May 2021
2022 Q1-Q4	Binding Parameter Specification (BPS)  	May 2021
2022 Q1-Q4	eCQM Logic and Implementation Guidance v5.0 (PDF) 	May 2021
2022 Q1-Q4	Technical Release Notes (PDF) 	May 2021
2022 Q1-Q4	Technical Release Notes. (ZIP) 	May 2021
2022 Q1-Q4	Standards and tool versions used for reporting period 	May 2021
2022 Q1-Q4	eCQM Flows - Coming Soon	

TRNs outline changes in eCQM specifications as compared with the previous version.

TRNs

Value Set Authority Center

[Welcome](#) [Search Value Sets](#) [Download](#) [Browse Code Systems](#)

VSAC Downloadable Resources

This page contains groups of value sets designated for a particular program usage. You can search the entire repository of published VSAC value sets in the [Search Value Sets](#) tab.

[CMS eCQM & Hybrid Measure Value Sets](#)
[CMS Pre-rulemaking eCQM Value Sets](#)
[C-CDA Value Sets](#)
[CDCREC Roll-up codes](#)

eCQMs will not be eligible for reporting to CMS unless and until they are proposed and finalized through the eCQM process. For more information about eCQMs please visit the [eCQM Resource Center](#).

- ▶ 2022 Reporting/Performance Period of eCQM & Hybrid Measure Value Sets
- ▶ 2021 Reporting/Performance Period of eCQM & Hybrid Measure Value Sets
- ▶ 2020 Reporting/Performance Period eCQM Value Sets
- ▶ 2019 Reporting/Performance Period eCQM Value Sets
- ▶ 2018 Reporting/Performance Period eCQM Value Sets
- ▶ 2017 Reporting/Performance Period eCQM Value Sets
- ▶ 2016 Reporting/Performance Period eCQM Value Sets
- ▶ 2015 Reporting/Performance Period eCQM Value Sets
- ▶ 2014 Reporting/Performance Period eCQM Value Sets

<https://vsac.nlm.nih.gov/valueset/expansions?pr=all#download-tab>

VSAC houses the value sets and Direct Reference Codes used by eCQMs and is maintained by the National Library of Medicine (NLM). You must have a free UMLS license to access value set details.

2022 Reporting/Performance Period eCQM Value Sets, Direct Reference Codes, and More

Available Downloads	Sorted by CMS ID*	Sorted by Value Set Name*	Sorted by Quality Data Model Category*
eCQM Value Sets for Eligible Hospitals Published May 06, 2021	Excel (xlsx) SVS (xml)	Excel (xlsx) SVS (xml) SVS (text)	Excel (xlsx)
eCQM Value Sets for Eligible Professionals and Eligible Clinicians Published May 06, 2021	Excel (xlsx) SVS (xml)	Excel (xlsx)	
All eCQM Value Sets (Eligible Professionals, Clinicians and Hospitals) Published May 06, 2021	Excel (xlsx) SVS (xml)	Excel (xlsx)	
Binding Parameter Specification for eCQM Value Sets Published May 06, 2021 ?	Excel (xlsx)		
Retired/Legacy Codes Currently in eCQM Value Sets Published May 06, 2021 ?	Excel (xlsx)		
Code System Versions Currently in eCQM Value Sets Published May 06, 2021 ?	Excel (xlsx)		
Direct Reference Codes Specified within eCQM HQMF files Published May 06, 2021 ?	Excel (xlsx)		

A **Value Set** is a list of specific values, terms, and their codes, used to describe clinical and administrative concepts used in eCQMs

A **Direct Reference Code (DRC)** is a specific code that is referenced directly in the eCQM logic to describe a data element or one of its attributes. DRC metadata include the description of the code, the code system from which the code is derived, and the version of that code system.

Value Set Snippet

Value Set Information

Expansion Versions: Latest

Export Value Set Results

Metadata

Description

Grouping Members

Name:
Antithrombotic Therapy

Code System:
RXNORM

Value Set Definition

Definition Type:
Grouping

Expansion Details

Expansion Profile
Most Recent Code System Versions in VSAC View

OID:
2.16.840.1.113762.1.4.1110.62

Steward: Contact
The Joint Commission

Definition Version: ?
20210409

This update was generated by VSAC to align with code changes published by the code system of one or more member value sets.

Value Set Members

Expanded Code List

View Toggle Clear

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Code	Descriptor	Code System	Version	Code System OID
1037045	dabigatran etexilate 150 MG Oral Capsule	RXNORM	2021-07	2.16.840.1.113883.6.88
1037179	dabigatran etexilate 75 MG Oral Capsule	RXNORM	2021-07	2.16.840.1.113883.6.88
1092398	aspirin 500 MG / diphenhydramine hydrochloride 25 MG Oral Tablet	RXNORM	2021-07	2.16.840.1.113883.6.88
1114198	rivaroxaban 10 MG Oral Tablet	RXNORM	2021-07	2.16.840.1.113883.6.88
1232082	rivaroxaban 15 MG Oral Tablet	RXNORM	2021-07	2.16.840.1.113883.6.88
1232086	rivaroxaban 20 MG Oral Tablet	RXNORM	2021-07	2.16.840.1.113883.6.88

Snippet from National Library of Medicine (NLM) Value Set Authority Center (VSAC): <https://vsac.nlm.nih.gov/>

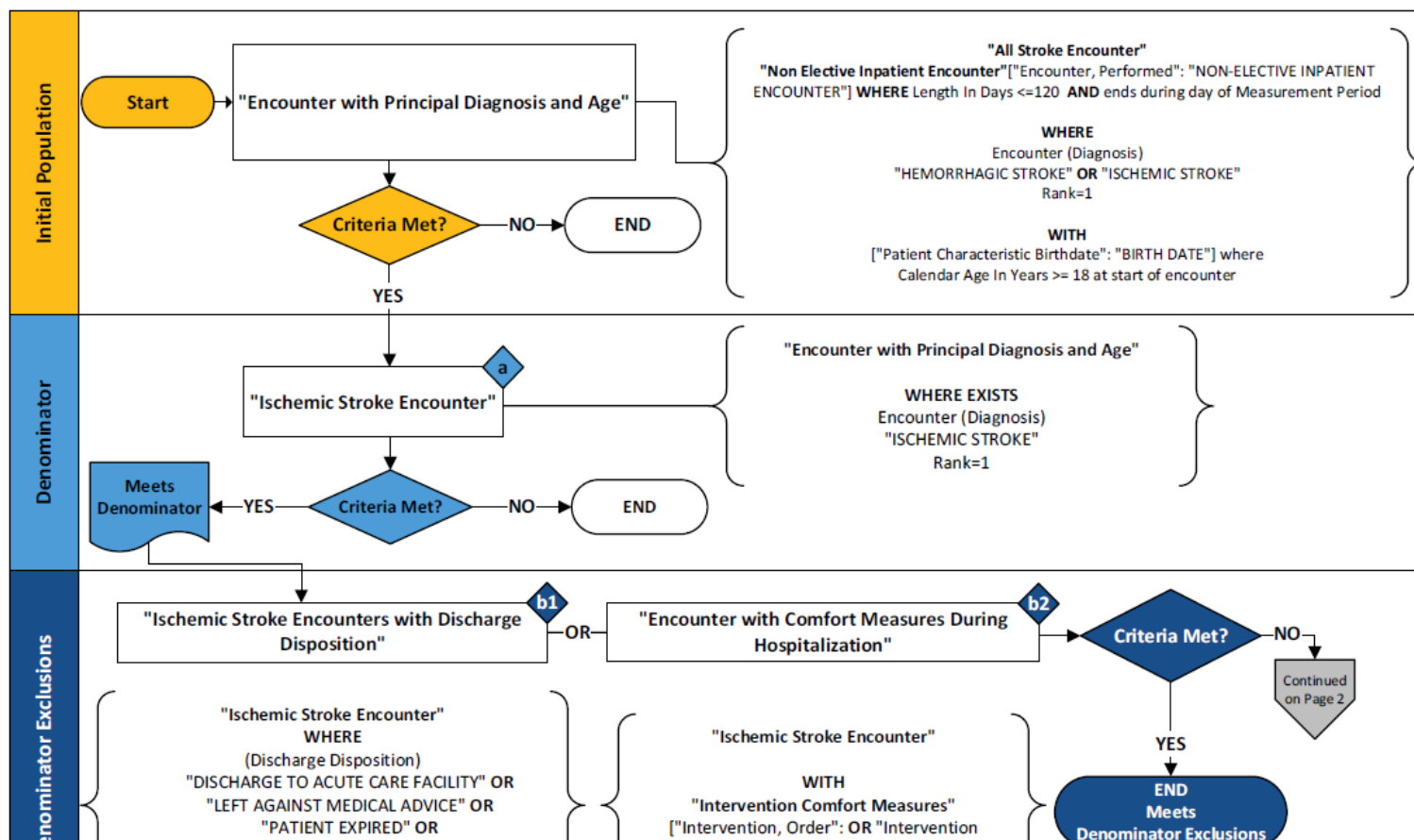
eCQM Flow Snippet: Discharged on Antithrombotic Therapy

eCQM Flows provide an overview of the population criteria components and their inclusion or exclusions into the eCQM's numerator.

2022 eCQM Flow – CMS104v10: Discharged on Antithrombotic Therapy (STK-02)*

*This flow diagram represents an overview of population criteria requirements. Please refer to the eCQM measure specification for a complete list of definitions, direct reference codes, data or timing elements included in this measure and required for submission.

Measure Flow Diagram



What resources are available to help me test the eCQMs?

Bonnie: An eCQM Testing Tool

BONNIE

A tool for testing electronic clinical quality measures

[LOGIN](#)
[Register](#)

[USER GUIDE](#) [USER GROUP](#) [API GUIDE](#) [REPORT BUG](#)

You must have a [HARP](#) (HCQIS Access and Roles Profile) account to access

streamlined and efficient




pretesting for eCQMs

developer empowerment



provides specific feedback on the behavior of the CQM logic

quality reporting



supports the CMS Quality Reporting Programs

Bonnie is a tool for testing electronic clinical quality measures (eCQMs) designed to support streamlined and efficient pre-testing of eCQMs, particularly those used in the CMS Quality Reporting Programs.

CURRENT VERSION 5.0.0

The version 5.0.0 release of Bonnie adds support for testing measures using CQL 1.5 and the QDM 5.6 model

CAPABILITIES V5.0.0

- Composite Measure Support
- Hybrid Measure Support
- Display CQL Definition Results
- VSAC Profile and Release Selection
- Custom Measurement Period
- Bonnie API
- CQL 1.5 Support
- QDM 5.6 Model Support

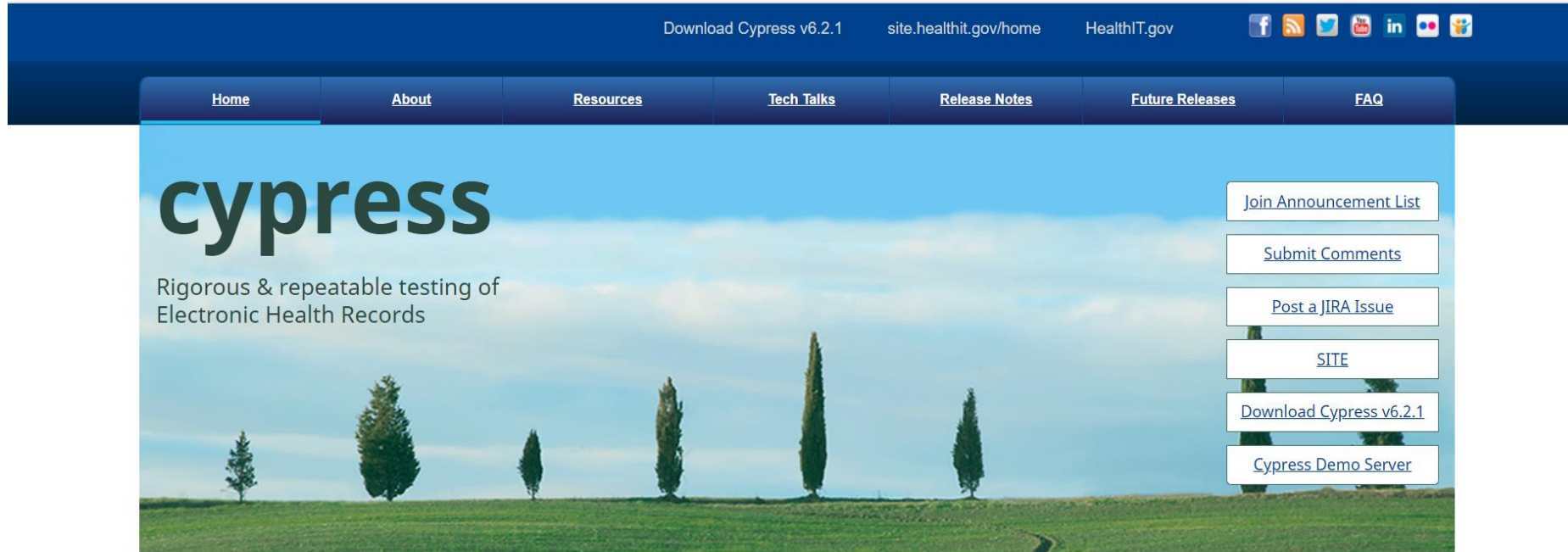
Information on what this version supports

<https://bonnie.healthit.gov/>

Bonnie: An eCQM Testing Tool (Cont'd)

- Bonnie is a software tool that allows eCQM developers to test and verify the behavior of their eCQM logic.
- The Bonnie application allows measure developers to independently load measures they have constructed using the Measure Authoring Tool (MAT) and helps measure developers execute the measure logic against the constructed patient test deck and evaluate whether the logic aligns with the intent of the measure.
- There are three instances of Bonnie available
 - Bonnie QDM - supports current QDM version of QDM-based eCQMs
 - Bonnie Prior- supported previous QDM versions of QDM-based eCQMs
 - Bonnie FHIR - supports FHIR-based eCQMs

Cypress Testing Tool



What is Cypress?

Cypress is the rigorous and repeatable testing tool of Electronic Health Records (EHR) and EHR modules in calculating eCQMs used by CMS's Quality Reporting Programs. The Cypress tool is open source and freely available for use or adoption by the health IT community

Objective

The objective of Cypress is to enable repeatable and rigorous testing of an EHR's ability to accurately calculate eCQMs. Cypress has been recognized by ONC as the official eCQM testing tool for use in CMS quality reporting programs electronic Clinical Quality Measure certification.

Bi-Weekly Tech Talks

NEW DIAL-IN INFORMATION

As of October 8, 2019, the Tech Talk dial-in information has changed. See below:

1. Go to

<https://www.healthit.gov/cypress/>

Cypress Testing Tool (Cont'd)

- Cypress is an open-source testing tool used by vendors to certify their electronic health records (EHRs) and health information technology (IT) modules for calculating eCQMs. Cypress is an official testing tool for the Office of the National Coordinator for Health IT (ONC) EHR Certification Program.
- Testing involves Cypress generating synthetic patient records for the subset of published eCQMs selected for certification and testing the ability of the EHR systems and health IT modules to accurately record, import, calculate, filter, and report eCQMs.
- Cypress integrated the Cypress Validation Utility + Calculation Check (CVU+) into the Cypress application. The CVU+ facilitates real world testing, providing health IT vendors the ability to perform tests using their own test patients.
- For measured entities submitting QRDA files - The CVU+ also supports validation with the CMS QRDA IGs and performs eCQM calculation with measure logic highlighting.

Where do I find key resources to help me understand eCQMs?

eCQI Resource Center

<https://ecqi.healthit.gov>

ECQI
RESOURCE CENTER

Electronic Clinical
Quality Measures

Resources -
Standards, Tools, &
Resources

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eCQI, CDS, FAQs
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Enter keywords

Q

Electronic Clinical Quality
Improvement (eCQI) Resource Center

The "one-stop shop" for stakeholders
engaged in electronic quality improvement

Eligible Clinician eCQMs >

Eligible Hospital / Critical Access Hospital eCQMs >

EC ECQMS

Eligible Clinician eCQMs

EC Pre-Rulemaking eCQMs

EH/CAH ECQMS

Eligible Hospital / Critical Access
Hospital eCQMs

EH/CAH Pre-Rulemaking eCQMs

OQR - Outpatient eCQMs

Hybrid Measures

NEW TO ECQMS?

Get Started with eCQMs

eCQM Lifecycle

MEASURE COLLABORATION

Measure Collaboration (MC)
Workspace

eCQM Data Element Repository
(DERep)

PERFORMANCE/REPORTING


- Any -

FIND AN eCQM

Enter a Measure Title or CMS ID (Up to 10 results displayed initially)


Find an eCQM

Featured Resources




Get Started with eCQMs

New to eCQMs? Learn the basics about
eCQMs, development, certification, and
resources to get started.



Educational Resources

Educational resources available
for eCQMs and eCQI,
Tools, CQL, FHIR, QDM, and QRDA.



eCQM Standards

Key standards for the electronic
transmission of health information used to
support eCQMs.

The eCQI
Resource Center
is the 'one-stop
shop' for the
most current
resources to
support
electronic
quality
improvement.

May 2022

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eCQI Resource Center – eCQI Tools and Resources Library



eCQI Tools & Key Resources

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The eCOM tools and resources provide a foundation for the development, testing, certification, publication, implementation, reporting, and continuous evaluation of quality measures and their improvement. You can refine the tool list by selecting a category of interest and/or a role that best describes your needs, or you can also click a specific tool from the list below to view additional details.

Filter Tools & Resources

By Title	By Category	By Role	
<input type="text"/>	<input type="text" value="- Any -"/>	<input type="text" value="- Any -"/>	<input type="button" value="Apply"/>

Atom Text Editor

[Atom Text Editor](#)

Category: Development

Who Uses Tool: Health IT Developer/Vendor, Measure Developer/Steward

Description:

Atom is an open source text editor. The 'Language-CQL' plug-in has functionality for [Clinical Quality Language \(CQL\)](#) syntax highlighting and [Fast Healthcare Interoperability Resources \(FHIR\)](#) model validation. This free text editor is also capable of performing measure evaluation and testing for eCOMs using the open source [CQL Evaluation Engine](#). Additional information is contained in the [Atom User Instructions](#).

Bonnie QDM

[Bonnie QDM](#)

Category: Development, Testing

Who Uses Tool: Health IT Developer/Vendor, Measure Developer/Steward

Description:

Bonnie is a software tool that allows [eCOM](#) developers to test and verify the behavior of their eCOM logic. The [Bonnie QDM](#) application allows [measure developers](#) to load [Quality Data Model \(QDM\)](#) based measures they have constructed using the [Measure Authoring Tool](#).

<https://ecqi.healthit.gov/ecqi-tools-key-resources?qt-teste=2>

eCQI Resource Center - eCQM Educational Resources

eCQM and eCQI Educational Resources



Get Started with eCQM/eCQI

General resources from a variety of sources and presentations

eCQM Tools

Resources available on eCQM tools such as Bonnie, Cypress, and the Measure Authoring Tool (MAT)

CQL

Resources available on the Clinical Quality Language (CQL) standard

FHIR

Resources available on the Fast Healthcare Interoperability Resources® (FHIR) standard

QDM

Resources available on the Quality Data Model (QDM) standard

QRDA

Resources available on the Quality Reporting Document Architecture (QRDA) standard

<https://ecqi.healthit.gov/ecqm-and-ecqi-education-resources>

eCQI Glossary

R

eCQMs
Electronic Clinical
Quality Measures

Resources
Standards, Tools, &
Resources

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eCQI, CDS, FAQs
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Agile development

Agile development is a term used to describe iterative software development in order to shorten the software development lifecycle. Agile development teams execute the entire software development lifecycle in smaller increments, usually called sprints, typically 1-4 weeks long. Agile development is often contrasted with traditional or waterfall development, where larger projects are planned up front and executed against that plan. Agile development is an iterative approach to development with regular feedback loops or intervals. These iterations allow diversion of a team to and productive in another part of a project while resolving a problem or issue in another part. Microsoft. (2021, May 12). [What is agile?](#)

Alignment

Measure alignment includes using the same quality measures and value sets across settings and within multiple programs when possible. Alignment is achieved when a set of measures works well across settings or programs to produce meaningful information without creating extra work for those responsible for the measurement.

Analytic model or framework

An analytic model for developing clinical practice guidelines is a visual representation of a causal pathway showing the linkages between how the proposed key research question(s) and intervention(s) under consideration as reflected in the PICOTS (P-Patient population; I- Intervention; C- Comparator; O- Outcome; T- Timing; S- Setting) framework and to their intended outcomes that require confirmation by evidence review to support related recommendations. The linkages in the model represent critical logical premises and presumed relationships among intermediate, surrogate, and ultimate health outcomes related to a specified clinical question. Woolf, S., Schünemann, H. J., Eccles, M. P., Grimshaw, J. M., Shekelle, P. (2012). Developing clinical practice guidelines: types of evidence and outcomes; values and economics, synthesis, grading, and presentation and deriving recommendations. *Implementation Science*, 7(61). <https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-7-61>

<https://ecqi.healthit.gov/glossary>

Additional Information

- Companion eCQM 101 Presentations
 - [Introduction](#)
 - [Specifics](#)
- [eCQI Resource Center](#)
- [Ask questions or provide website feedback](#)

Acronyms

Acronym	Definition
CMS	Centers for Medicare & Medicaid Services
CVU	Cypress Validation Utility
DRC	Direct Reference Code
eCQI	Electronic Clinical Quality Improvement
eCQM	Electronic Clinical Quality Measure
EHR	Electronic Health Record
FHIR	Fast Healthcare Interoperability Resources
HARP	HCQIS Access and Roles Profile
HCQIS	Health Care Quality Information Systems
IG	Implementation Guide
MAT	Measure Authoring Tool
NLM	National Library of Medicine

Acronyms (Cont'd)

Acronym	Definition
ONC	Office of the National Coordinator for Health Information Technology
QDM	Quality Data Model
QRDA	Quality Reporting Document Architecture
TRN	Technical Release Note
UMLS	Unified Medical Language System
VSAC	Value Set Authority Center