

eCQM Transition from Quality Data Model to Quality Improvement Core

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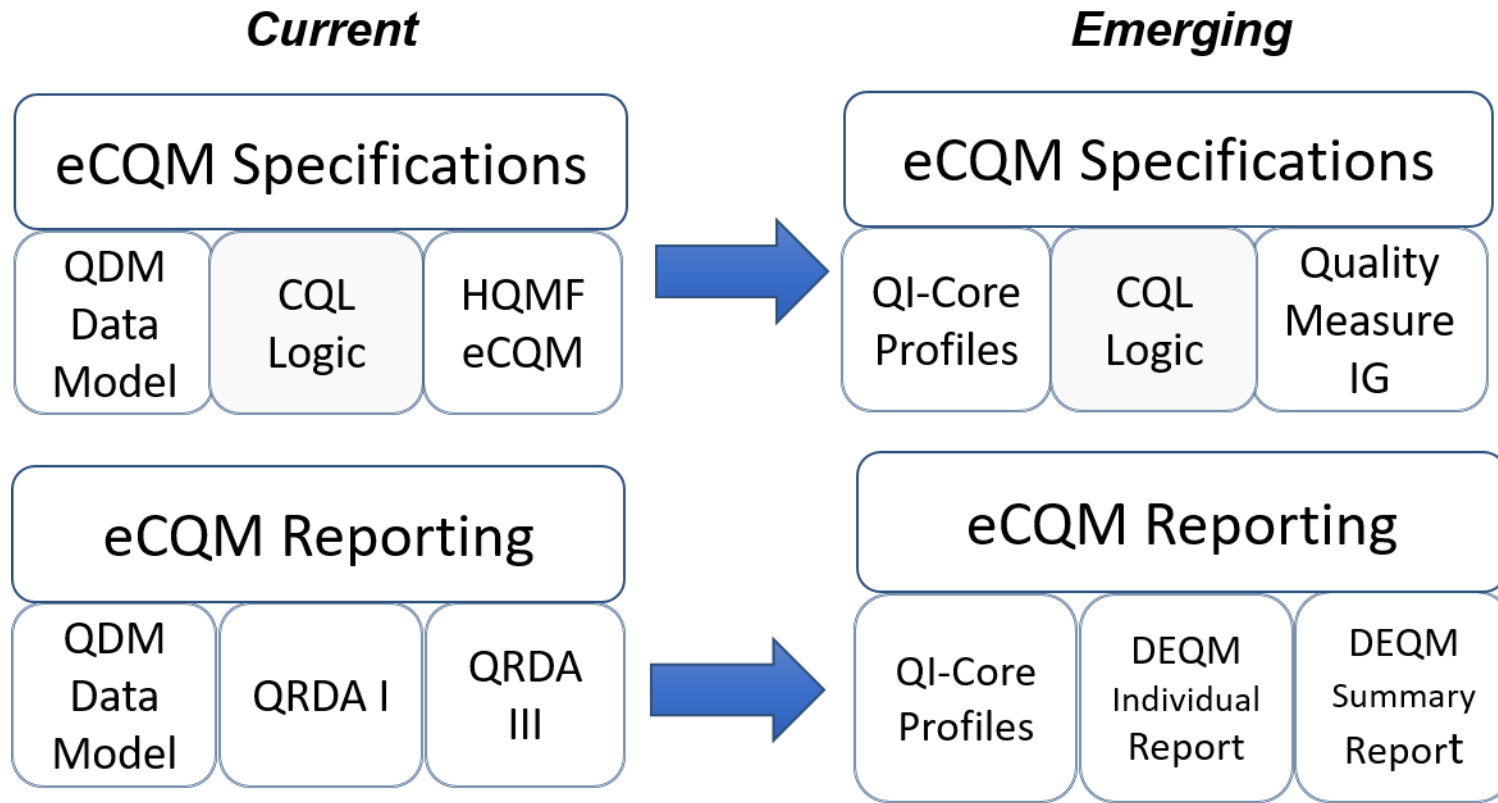
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Agenda

- Welcome
- Quality Improvement (QI-Core) for electronic clinical quality measures (eCQMs)
- Quality Data Model (QDM) vs QI-Core
- QDM to QI-Core mapping
- QDM versus QI-Core data element examples
- Available resources
- Opportunities to get involved

Evolution of eCQM Standards

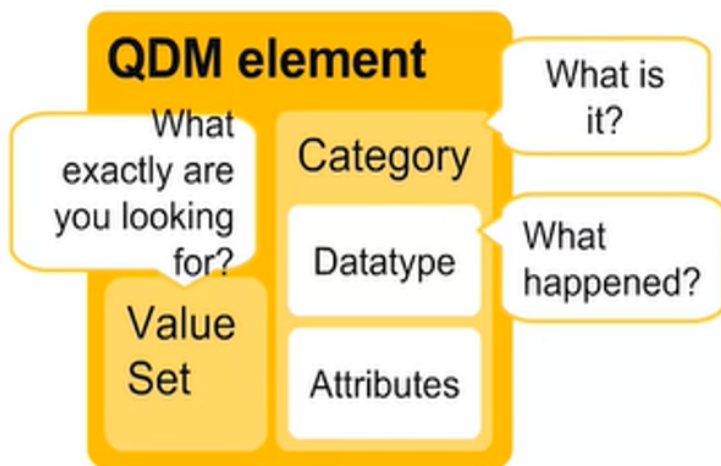


Goal is to align quality measurement standards for eCQM development and reporting using Fast Healthcare Interoperability Resources® (FHIR)

- QI-Core replaces QDM for clinical data elements
- Quality Measure Implementation Guide (IG) replaces HQMF for eCQM structure
- DEQM IG for Individual and Summary replaces QRDA I and III

CQL – Clinical Quality Language | HQMF- Health Quality Measure Format | QRDA- Quality Reporting Document Architecture | DEQM – Data Exchange for Quality Measures

QDM Category vs QI-Core Profile



Name	Flags	Card.	Type	Description & Constraints
Encounter		0..*	USCoreEncounterProfile	
request-statusReason	S	0..1	CodeableConcept	Reason for current status URL: http://hl7.org/fhir/StructureDefinition/request-statusReason Binding: (unbound) (example)
qicore-encounter-procedure	S	0..*	(Complex)	Encounter Procedure Extension URL: http://hl7.org/fhir/us/qicore/StructureDefinition/qicore-encounter-procedure
status		1..1	code	
class	S	1..1	Coding	
type	S	1..*	CodeableConcept	
priority		0..1	CodeableConcept	Binding: SNOMED CT Priorities Codes (preferred)
subject	S	1..1	Reference(QICorePatient)	
basedOn		0..*	Reference(QICoreServiceRequest)	
participant	S	0..*	BackboneElement	
individual	S	0..1	Reference(QICorePractitioner)	
period	S	0..1	Period	
length	S	0..1	Duration	
reasonCode	S	0..*	CodeableConcept	
diagnosis	S	0..*	BackboneElement	
qicore-encounter-diagnosisPresentOnAdmission	S	1..1	CodeableConcept	onAdmission URL: http://hl7.org/fhir/us/qicore/StructureDefinition/qicore-encounter-diagnosisPresentOnAdmission Binding: ExampleDiagnosisOnAdmissionCodes (required)
condition	S	1..1	Reference(QICoreCondition QICoreProcedure)	
use	S	0..1	CodeableConcept	
rank	S	0..1	positiveInt	
hospitalization	S	0..1	BackboneElement	
origin		0..1	Reference(QICoreLocation)	
admitSource	S	0..1	CodeableConcept	
reAdmission	S	0..1	CodeableConcept	
destination		0..1	Reference(QICoreLocation)	
dischargeDisposition	S	0..1	CodeableConcept	
location	S	0..*	BackboneElement	
location	S	1..1	Reference(QICoreLocation)	
period		0..1	Period	
serviceProvider	S	0..1	Reference(QICoreOrganization)	
partOf		0..1	Reference(QICoreEncounter)	

QI-Core Profile Identifies

- all attributes (called elements in FHIR)
- that must be supported (red **S** flag) by implementers
- required value sets specified in Description & Constraints column

Comparing QDM and QI-Core

- QDM

- Data model containing information needed for quality measurement
- Currently used to represent eCQM data elements
- Maintained by CMS for use in eCQMs
- Updated by QDM User Group

- QI-Core

- HL7 Implementation Guide defines FHIR profiles for quality improvement
- Informed by QDM
- Maintained by the HL7 Clinical Quality Information workgroup

QI-Core Profiles and QDM Datatypes

- QI-Core Profiles are constrained by elements such as status and intent.
- One profile may address multiple QDM datatypes.
- MedicationRequest QI-Core Profile represents the QDM datatypes:
 - Immunization, Order
 - Medication, Active
 - Medication, Discharge
 - Refills on a Medication, Dispensed
 - Medication, Order

QI-Core Scope

QI-Core Profile	USCore Profile	Base Resource
QICoreAdverseEvent		AdverseEvent
QICoreAllergyIntolerance	USCoreAllergyIntolerance	AllergyIntolerance
QICoreBodyStructure		BodyStructure
QICoreCarePlan	USCoreCarePlan	CarePlan
QICoreCareTeam	USCoreCareTeam	CareTeam
QICoreClaim		Claim
QICoreCommunication		Communication
QICoreCommunicationNotDone		Communication
QICoreCommunicationRequest		CommunicationRequest
QICoreCondition	USCoreCondition	Condition
QICoreCoverage		Coverage
QICoreDevice		Device
QICoreDeviceNotRequested		DeviceRequest

Contents show derivation of QI-Core Profiles from USCore Profile and/or Base Resources

QDM-QI-Core Map* Example: MedicationRequest

QDM Context	QI-Core R4	Comments
Medication, Discharge	MedicationRequest	
Medication, Discharge active	MedicationRequest.status	Constrain to "active"
	MedicationRequest.statusReason	
QDM Attributes		
code	MedicationRequest.medication[x]	RxNorm
id	MedicationRequest.id	
dosage	MedicationRequest.dosageInstruction.doseAndRate.dose[x]	Range, quantity
supply	MedicationRequest.dispenseRequest.quantity	Amount to be dispensed in one fill
daysSupplied	MedicationRequest.dispenseRequest.expectedSupplyDuration	Duration
frequency	MedicationRequest.dosageInstruction.timing	Timing schedule (e.g., every 8 hours)
refills	MedicationRequest.dispenseRequest.numberOfRepeatsAllowed	Integer
route	MedicationRequest.dosageInstruction.route	
setting	MedicationRequest.category	Constrain category to "Community"
reason	MedicationRequest.reasonCode	The reason for ordering or not ordering the medication

Shows QDM datatypes, mapping to QI-Core Profile, additional notes, and implementer guidance.

* current build version - may change

QDM to QI-Core: Medications on Discharge

Excerpt from CMS104v9, Discharged on Antithrombotic Therapy

▲ Encounter With Pharmacological Contraindications for Antithrombotic Therapy at Discharge

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

Translation of CMS104v9 to FHIR

▲ Pharmacological Contraindications for Antithrombotic Therapy at Discharge

["MedicationRequest": medication in "Pharmacological Contraindications For Antithrombotic Therapy"] Pharmacological
where exists (Pharmacological.category C where FHIRHelpers.ToConcept(C) ~ Global."Community" or FHIRHelpers.ToConcept(C) ~ Global."Discharge")
and Pharmacological.status in { 'active', 'completed' }
and Pharmacological.intent = 'order'

QDM to QI-Core: Laboratory Tests

Excerpt from CMS124v9, Cervical Cancer Screening

▲ Cervical Cytology Within 3 Years

["Laboratory Test, Performed": "Pap Test"] CervicalCytology
where CervicalCytology.relevantDatetime 3 years or less on or before
end of "Measurement Period"
and CervicalCytology.result is not null

Translation of CMS124v9 to FHIR

▲ Cervical Cytology Within 3 Years

[Observation: "Pap Test"] CervicalCytology
where CervicalCytology.value is not null
and CervicalCytology.status in { 'final', 'amended', 'corrected', 'preliminary' }
and Global."Normalize Interval"(CervicalCytology.effective) ends 3 years or less on or before end of "Measurement Period"

List of QI-Core Action Not Done Profiles

- QICoreCommunicationNotDone
- QICoreDeviceNotRequested
- QICoreImmunizationNotDone
- QICoreMedicationNotDispensed
- QICoreMedicationAdministrationNotDone
- QICoreMedicationNotDispensed
- QICoreMedicationNotRequested
- QICoreObservationNotDone
- QICoreProcedureNotDone
- QICoreServiceNotRequested

Resources to Get You Started

- Current FHIR Measures on GitHub
- QI-Core current build – will change
Update publication planned for August 2021
- QDM version 5.6
- Electronic Clinical Quality Improvement (eCQI) Resource Center FHIR Education page

Opportunities to Get Involved

- Collaborative learning
 - Cooking with CQL, QDM, and FHIR® Webinars
- Standards advancement
 - HL7 Clinical Quality Information workgroup
 - HL7 FHIR® Connectathons
- eCQI Resource Center FHIR Connect page

Discussion Questions



Key Points of Contact

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Backup Slides

QI-Core Profile compared to US Core Profile

QICoreMedicationRequest

Text Summary	Differential Table	Snapshot Table	All
Name	Flags	Card.	Type
MedicationRequest		0..*	USCoreMedicationRequestProfile
id		0..1	string
status	S	1..1	code
intent		1..1	code
category	S	0..*	CodeableConcept
doNotPerform	S	0..1	boolean
medication[x]	S	1..1	
medicationCodeableConcept			CodeableConcept
medicationReference			Reference(QICoreMedication)
subject	S	1..1	Reference(QICorePatient)
encounter	S	0..1	Reference(QICoreEncounter)
authoredOn	S	1..1	dateTime

USCore MedicationRequest

Text Summary	Differential View	Full View	All
Name	Flags	Card.	Type
MedicationRequest		0..*	MedicationRequest
status	S	1..1	code
intent	S	1..1	code
reported[x]	S	0..1	
reportedBoolean			boolean
reportedReference			Reference(US Core Patient Profile US Core Practitioner Profile US Core Organization Profile)
medication[x]	S	1..1	
medicationCodeableConcept			CodeableConcept
medicationReference			Reference(US Core Medication Profile)

Differential view comparing QI-Core and USCore MedicationRequest. Adds 'Must Support' flags and binds to terminology.

Reading the Profile Differential Table

- A red flag indicates whether an element must be supported if present.
- Cardinality indicates how many observations may or must be reported for the element.
- Type defines the type of data within the element, such as a code or a reference to another profile.

Text Summary				Differential Table				Snapshot Table				All			
Name				Flags				Card.				Type			
MedicationRequest								0..*				USCoreMedicationRequestProfile			
id								0..1				string			
status				S				1..1				code			
intent								1..1				code			
category				S				0..*				CodeableConcept			
doNotPerform				S				0..1				boolean			
medication[x]				S				1..1							
medicationCodeableConcept												CodeableConcept			
medicationReference												Reference(QICoreMedication)			
subject				S				1..1				Reference(QICorePatient)			
encounter				S				0..1				Reference(QICoreEncounter)			
authoredOn				S				1..1				dateTime			

QDM to QI-Core Mapping

- Use QDM to QI-Core Mapping,* which provides detailed mapping of all QDM datatypes and attributes to QI-Core R4 resources, profiles, and elements.
- * current build - may change

QI-Core Extensions

QI-Core Extensions also enable identifying additional concepts:

- Actions “Not Performed”
- Procedures associated with encounters
- Elective procedures
- Conditions present on admission

QI-Core and Reasons “Not Performed”

- Many quality measures ask for reasons specific actions were intentionally not performed.
- QI-Core adds profiles to simplify authoring, avoiding the need to write longer expressions.

```
define "Antithrombotic Not Given at Discharge":  
  ["MedicationRequest": "Antithrombotic Therapy"] NoAntithromboticDischarge  
    where NoAntithromboticDischarge.doNotPerform is true  
      and (singleton from NoAntithromboticDischarge.reasonCode in "Medical Reason"  
        or singleton from NoAntithromboticDischarge.reasonCode in "Patient Refusal")
```

- The "not performed" profiles specify the status (doNotPerform), the action not taken and the intentional reason.

QDM to QI-Core Example

- Example measure, CMS124, Cervical Cancer Screening
 - [GitHub link](#)
 - [Human Readable](#)