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CONSULTING GROUP

CHANGING LANDSCAPE OF QUALITY STANDARDS

11/8/2016

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Senior Software Architect

Our Mission:

- Improve healthcare through health information technology (IT)
- Lead the industry through our consulting and volunteer practice

Our Services:

- Software & standard development & implementation
- Terminology, data governance, and education
- Strategic advice for health IT planning, design, and purchasing

Kanwarpreet Sethi

- Co-chair of HL7's Clinical Quality Information workgroup
- Expert in quality measurement standards
- Co-author of HQMF and QRDA
- Senior Software architect

Ground Rules

- Webinar is being recorded
- All attendees are on mute
- Submit questions through the chat feature
- Q&A at the end of the presentation
- Slides and a link to the recording will be posted to: https://www.lantanagroup.com/resources/presentations/

Agenda

- Overview of Clinical Quality Measurement
- Current Quality Standards
- The Need for New Standards
- Future Quality Standards
- Transition and Impact
- Summary and Conclusions

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- **Overview of Clinical Quality Measurement**
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What is a Quality Measure?

- Usually derived from a clinical guideline for care
- Quantifies the standard of care expressed in the guideline
- Defines actions/outcomes that can be compared across providers and populations
- Guides clinicians in providing high quality of care

What is an eMeasure?

- A Clinical Quality Measure (CQM) expressed in a machine computable format such as XML
- AKA **e**lectronic **C**linical **Q**uality **M**easure (**eCQM**)
- Designed to not require manual intervention for data extraction and calculation
- Can originate from a paper measure or can be created from scratch
- Requires work to express logic and codify measure that can be understood unambiguously by a machine

Note: eMeasure and eCQM are used interchangeably

Sample eMeasure Construction

Clinical Guideline:

Patients with ischemic stroke and history of atrial fibrillation or atrial flutter should be prescribed anticoagulants

Quality Measure:

% of patients with history of Afib/Aflutter, with diagnosis of ischemic stroke that were given anticoagulant at discharge

Electronic Quality Measure:

Maps discrete data elements to standard terms

Defines numerator and denominator criteria

Electronic Quality Measure:

% of patients with history of Afib/Aflutter, with diagnosis of ischemic stroke that were given Anticoagulant at discharge

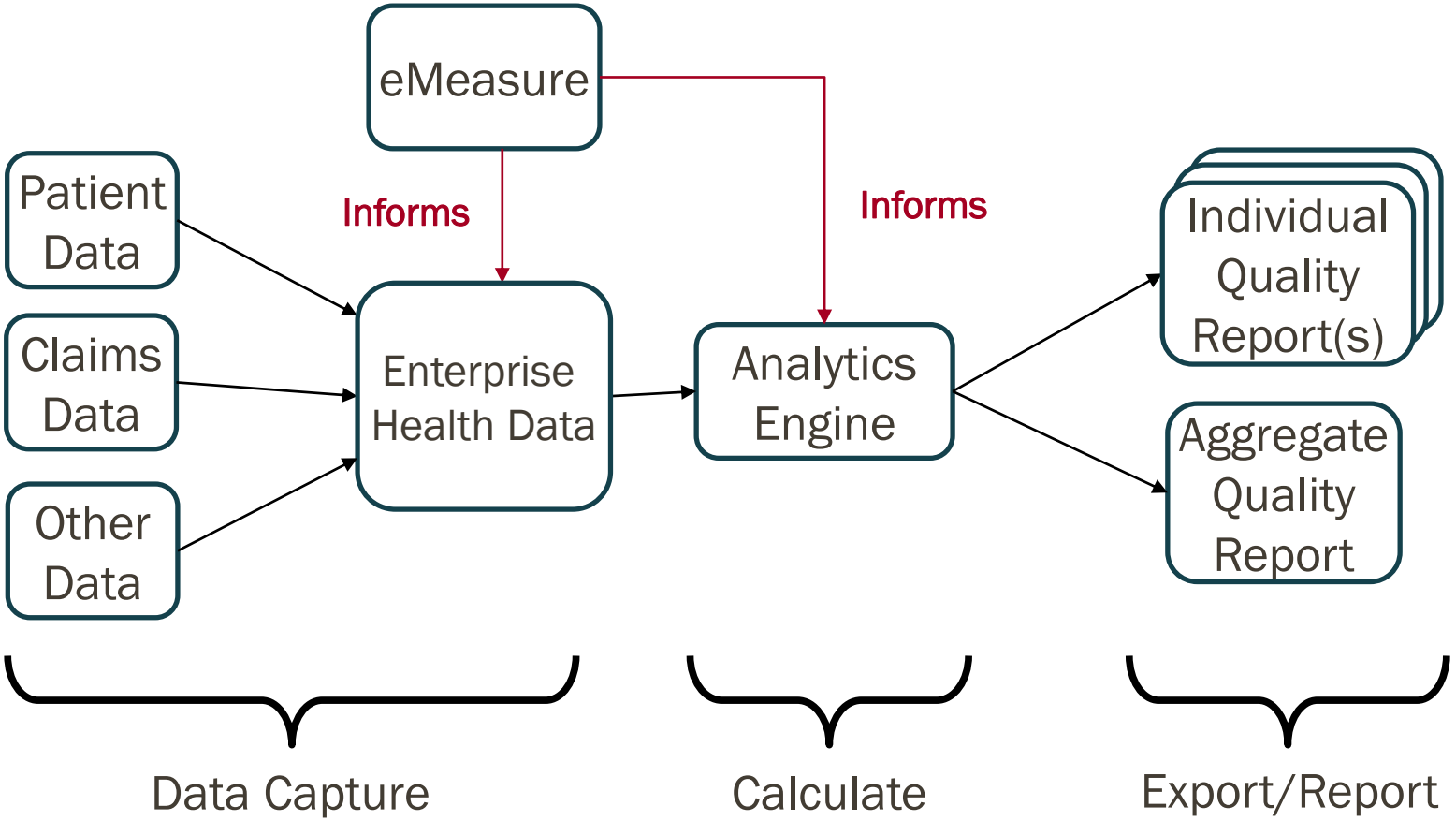
Data Criteria

- Discharge diagnosis: Ischemic stroke
- Hx of: Atrial fibrillation/Atrial flutter
- Discharge medication: Anticoagulant

Population Criteria

- DENOMINATOR
  - **AND**: Discharge diagnosis: Ischemic stroke
  - **AND**: Hx of: Atrial fibrillation/Atrial flutter
- NUMERATOR
  - **AND**: Discharge medication: Anticoagulant

Quality Reporting Process



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- **Current Quality Standards**
  - eCQM Definition Standards
  - eCQM Reporting Standards
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Standards Landscape

eCQM Definition	**Current**	**Future**
eCQM Reporting	**Current**	**Future**

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Health Quality Measures Format

HL7 HQMF:

- Intl. Standard for eCQMs
- Machine readable
- Formalizes:
  - Metadata
  - Data Elements
  - Logic

```
<QualityMeasureDocument>
    HQMF Header

    HQMF Body
     <section>
       <title>Population criteria</title>
       <text>
       <entry>Initial Patient Pop</entry>
       <entry>Denominator</entry>
       <entry>Numerator</entry>
       …
     </section>
     <section>
       <title>Data criteria</title>
       <text>
       <entry>
       …
     </section>
        …
</QualityMeasureDocument>
```


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Quality Data Model

- Quality Data Model (QDM) is a Domain Analysis Model
- Specifies datatypes and expressions for eMeasures
- Examples of Datatypes:
  - Encounters
  - Medications
  - Procedures
  - Lab Tests
- Examples of Expressions:
  - AND
  - OR
  - NOT
  - Satisfies Any/All
  - Timing operations (During, Overlap, Starts before etc.)

Example: QDM Datatypes and Expressions

Initial Population =

- AND: Age >= 23 year(s) at: "Measurement Period"
- AND: Age < 64 year(s) at: "Measurement Period"
- AND: "Patient Characteristic Sex: Female"
- AND: Union of:
  - "Encounter, Performed: Office Visit"
  - "Encounter, Performed: Face-to-Face Interaction"
  - "Encounter, Performed: Preventive Care Services - Established Office Visit, 18 and Up"
  - "Encounter, Performed: Preventive Care Services-Initial Office Visit, 18 and Up"
  - "Encounter, Performed: Home Healthcare Services"
  - during "Measurement Period"

Denominator =

- AND: Initial Population

Denominator Exclusions =

- OR: "Procedure, Performed: Hysterectomy with No Residual Cervix" ends before end of "Measurement Period"

Numerator =

- AND: "Laboratory Test, Performed: Pap Test (result)" <= 2 year(s) ends before end of "Measurement Period"

Example: QDM Datatypes

Initial Population =

- AND: Age >= 23 year(s) at: "Measurement Period"
- AND: Age < 64 year(s) at: "Measurement Period"
- AND: **"Patient Characteristic Sex: Female"**
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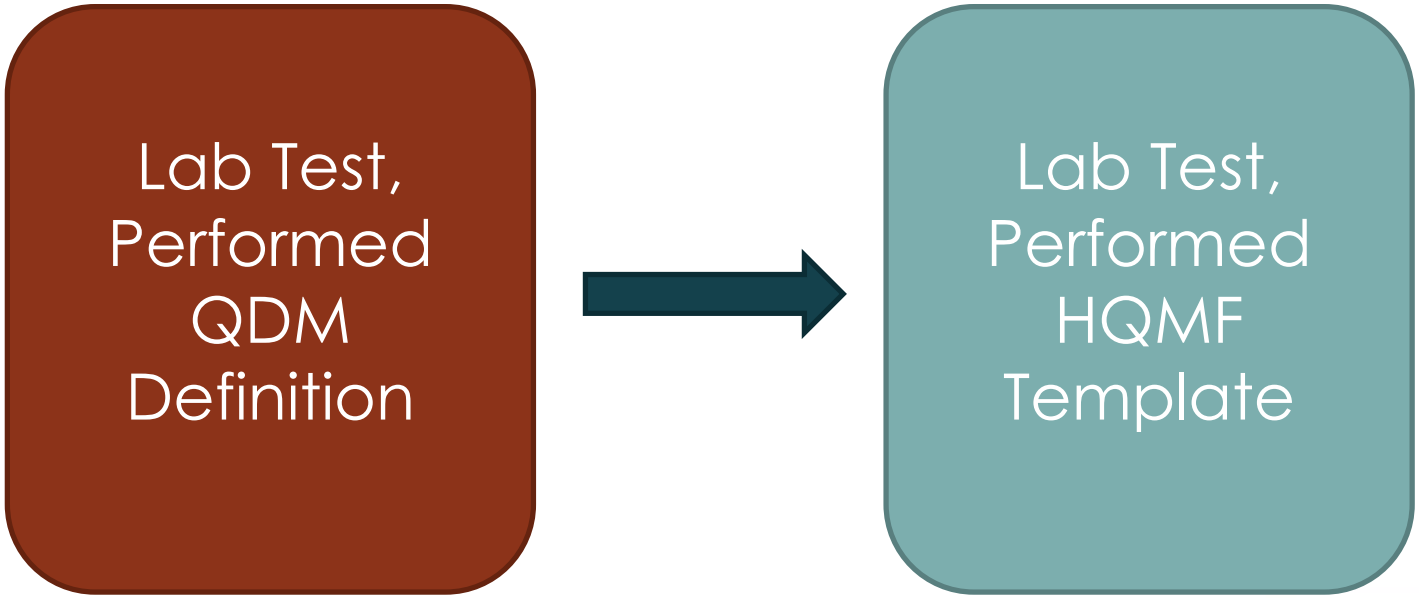
- AND: "Laboratory Test, Performed: Pap Test (result)" **<= 2 year(s) ends before end of** "Measurement Period"

QDM-Based HQMF Standard

- Contains HQMF XML equivalent for QDM datatypes
- Provides the machine readable version of QDM for querying purposes
- Represent the data queries that will be executed



Standards Landscape

eCQM Definition	**Current**	**Future**
	HQMF	
	QDM Data Model	
	QDM Logic	
eCQM Reporting	**Current**	**Future**

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Quality Reporting Document Architecture

QRDA is a Clinical Document Architecture (CDA)-based standard for reporting patient quality data for one or more quality measures

QRDA Category I (Single-patient Report)

- Individual patient-level report

*QRDA Category II (Patient List Report) **

- *Multi-patient report*

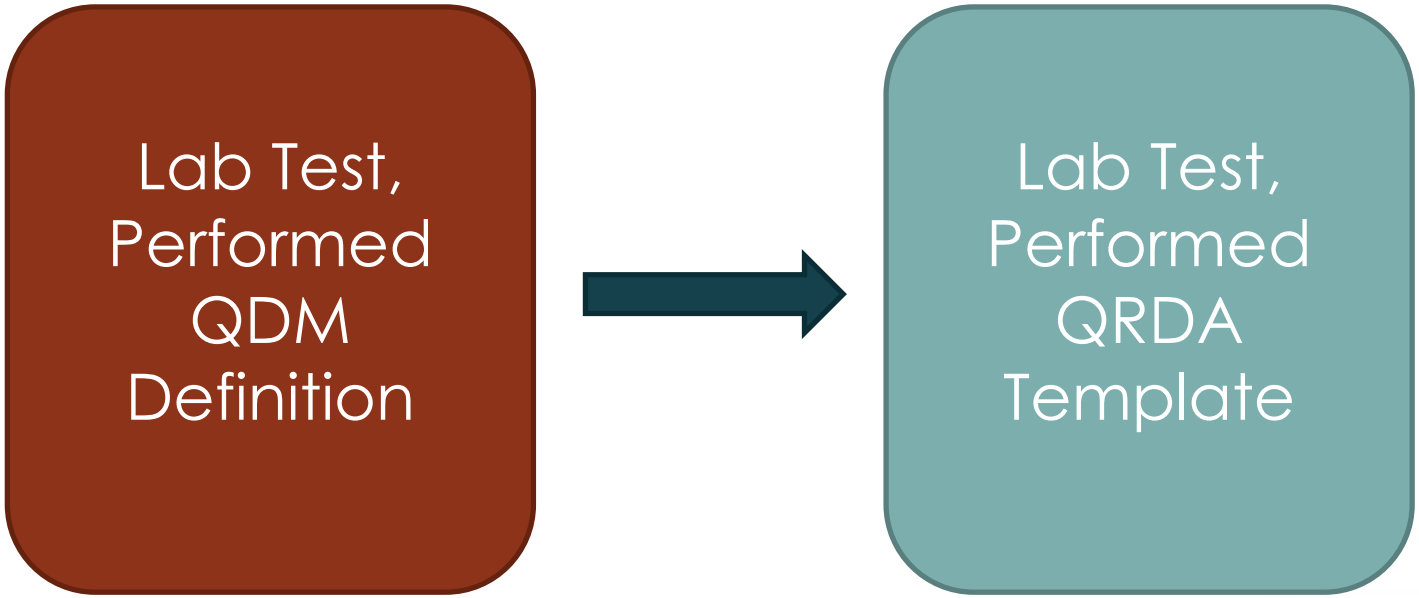
QRDA Category III (Aggregate Report)

- Aggregate quality report for a given population

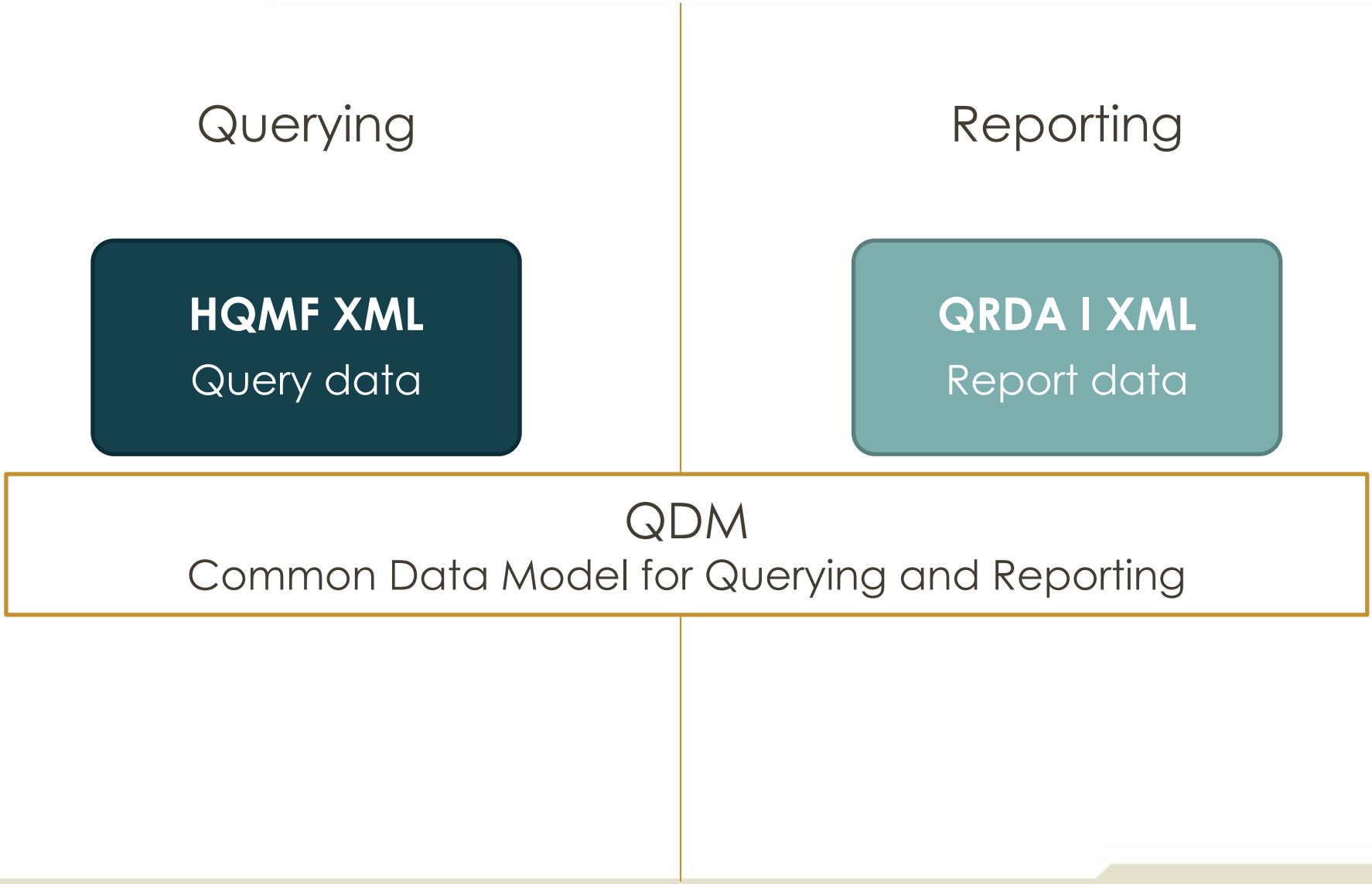
**QRDA Category II was proposed, but never formally created as a standard.*

QDM-Based QRDA Standard

- Contains QRDA XML equivalent for QDM datatypes
- Used to report the QDM data elements that the eCQM is querying for
- Provides the machine readable version of QDM for reporting purposes



Querying and Reporting



Standards Landscape

eCQM Definition	**Current**	**Future**
	HQMF	
	QDM Data Model	
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eCQM Reporting	**Current**	**Future**
	QRDA I	
	QDM Data Model	
	QRDA III	

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Detour: Clinical Decision Support (CDS)

- Usually derived from a clinical guideline
- Provides clinicians with advice and support based on established guidelines of care
- Support is in the form of real-time pop-ups as clinicians provide care
- Help clinicians provide high-quality health care

Sample eMeasure Construction

Clinical Guideline:

Patients with ischemic stroke and history of atrial fibrillation or atrial flutter should be prescribed anticoagulants

Quality Measure:

% of patients with history of Afib/Aflutter, with diagnosis of ischemic stroke that were given anticoagulant at discharge

Sample Decision Support Rule Construction

Clinical Guideline:

Patients with ischemic stroke and history of atrial fibrillation or atrial flutter should be prescribed anticoagulants

Quality Measure:

% of patients with history of Afib/Aflutter, with diagnosis of ischemic stroke that were given anticoagulant at discharge

Decision Support Rule:

IF a patient has a history of Afib/Aflutter, and has a diagnosis of ischemic stroke **THEN** give anticoagulant at discharge

Disconnect between CDS and CQM

Clinical Guideline:

Patients with ischemic stroke and history of atrial fibrillation or atrial flutter should be prescribed anticoagulants

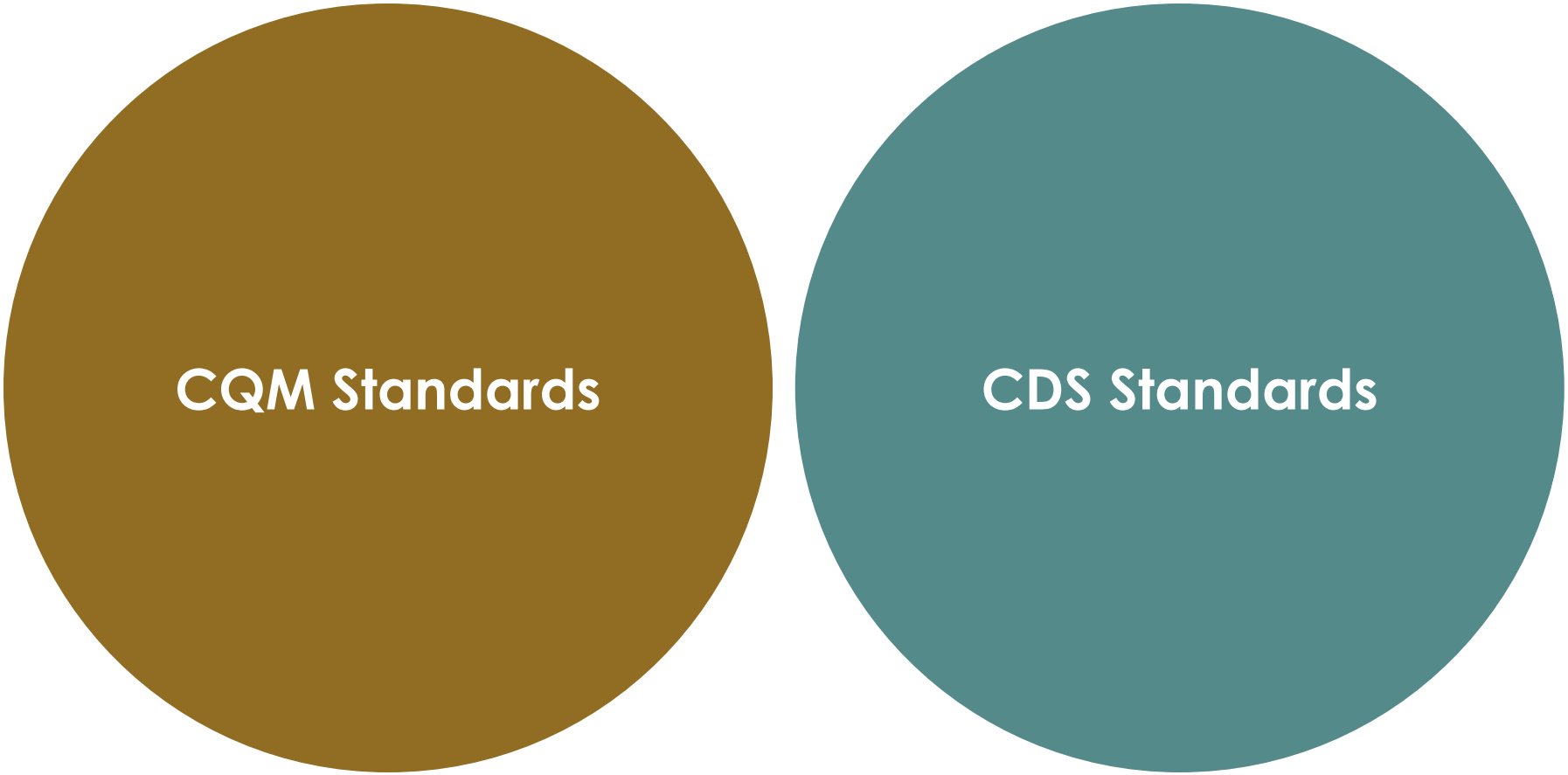
Quality Measure:

% of **patients with history of** **/Aflutter**, with **diagnosis of ischemic stro** **coagulant at discharge**

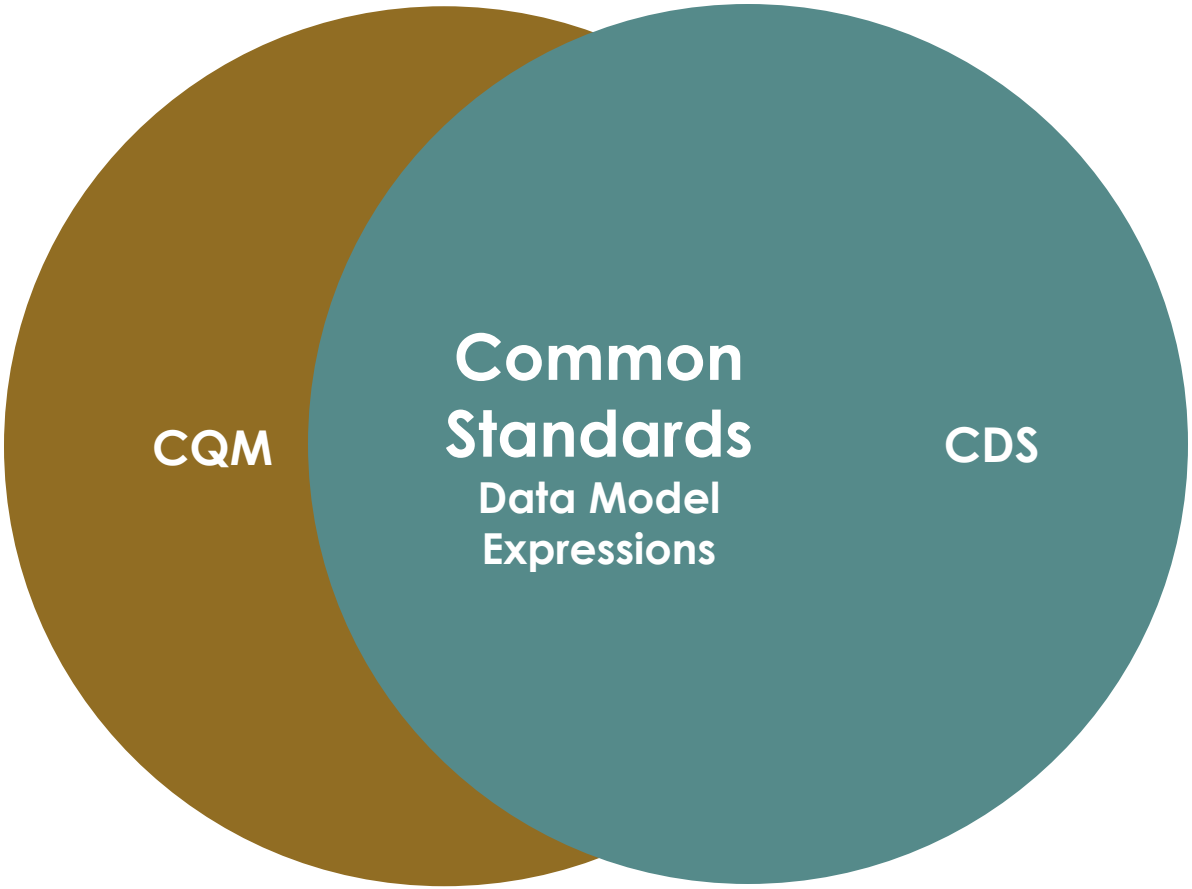
Decision Suppo

IF a **patient has a history** **Afib/Aflutter**, and has a **diagnosis of ischemic stroke THEN** give **anticoagulant at discharge**

Different Standards for CQM and CDS



Goal: Shared Standards



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Other Influences

Current standards based on HL7 Version 3

- Minimal cohesiveness between current standards
- HL7 V3 is complex and lacks executability
- V3 messaging never adopted in the US

Industry rapidly shifting towards HL7 FHIR

- **FHIR** = **F**ast **H**ealth **I**nteroperable **R**esources
- Simpler, implementer friendly syntax
- Supports common model, syntax across API and Reports

Need for shareable, executable artifacts

- Reduce implementer and developer burden
- Reduce maintenance and repetition
- Increase accuracy of logic authoring

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Common Data Model

- Quality Improvement and Clinical Knowledge (QUICK)
- Replaces QDM Data

Common Expression Language

- Clinical Quality Language (CQL)
- Replaces QDM Logic

Common FHIR Backbone

FHIR Measure Resource

- Represents an eCQM in FHIR
- Replaces HQMF

FHIR Measure Report Resource

- Represents quality reports in FHIR
- Replaces QRDA

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FHIR Measure Resource

Represents an eCQM in FHIR syntax

It contains:

- Metadata of the measure
- The data elements need by the eCQM
- The logic of the calculation

Compared to current standards:

- Replaces HQMF
- Benefits from FHIR syntax (simpler, easier to implement)
- Supports an operation to execute the measure

A logical model that represents clinical data, used by:

- eCQMs
- CDS Rules
- Other knowledge artifacts

Compared to current standards:

- Replaces QDM Data Elements
- Harmonizes data models used by CDS and CQM
- Unlike the QDM, contains data elements only (no logic)

An expression language to write logic, used by:

- Clinical Quality Measures
- Decision Support Rules
- Other clinical knowledge artifacts

Compared to current standards:

- Replaces QDM logic expressions
- Supports logic reuse and sharing
- Data model agnostic
- Provides both author-friendly and machine-friendly syntax
- Automatic transformation to machine-friendly syntax
- No need for manual mapping (unlike QDM/HQMF)

Standards Landscape

eCQM Definition	**Current**	**Future**
	HQMF	FHIR eCQM
	QDM Data Model	QUICK Data Model
	QDM Logic	CQL
eCQM Reporting	**Current**	**Future**
	QRDA I	
	QDM Data Model	
	QRDA III	

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FHIR Measure Report

Represents a quality measure report in FHIR syntax:

- Patient level quality report (individual)
- Summary level quality report (aggregate)
- Collection of patient level reports

Compared to current standards:

- Replaces QRDA I and QRDA III
- Benefits from FHIR syntax (simpler, easier to implement)
- Combines both patient level and aggregate level reports

Collection of FHIR representations of the QUICK model

- QUICK data elements have an equivalent in Qi-Core (where possible)
- Machine readable version of QUICK for reporting purposes

Compared to current standards:

- Replaces QDM-based QRDA Standard
- Benefits from FHIR syntax (simpler, easier to implement)
- Automatic transformation between QUICK and Qi-Core.
- No need for manual mapping (different from QDM/QRDA)

Querying and Reporting

Querying

Reporting

FHIR + CQL
Query data

FHIR + Qi-Core
Report data

QUICK
Common Data Model for Querying and Reporting

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Standards Landscape

	Current	Future
eCQM Definition	HQMF	FHIR eCQM
	QDM Data Model	QUICK Data Model
	QDM Logic	CQL
eCQM Reporting	**Current**	**Future**
	QRDA I	Qi-Core, FHIR Measure Report
	QDM Data Model	QUICK Data Model
	QRDA III	FHIR Measure Report

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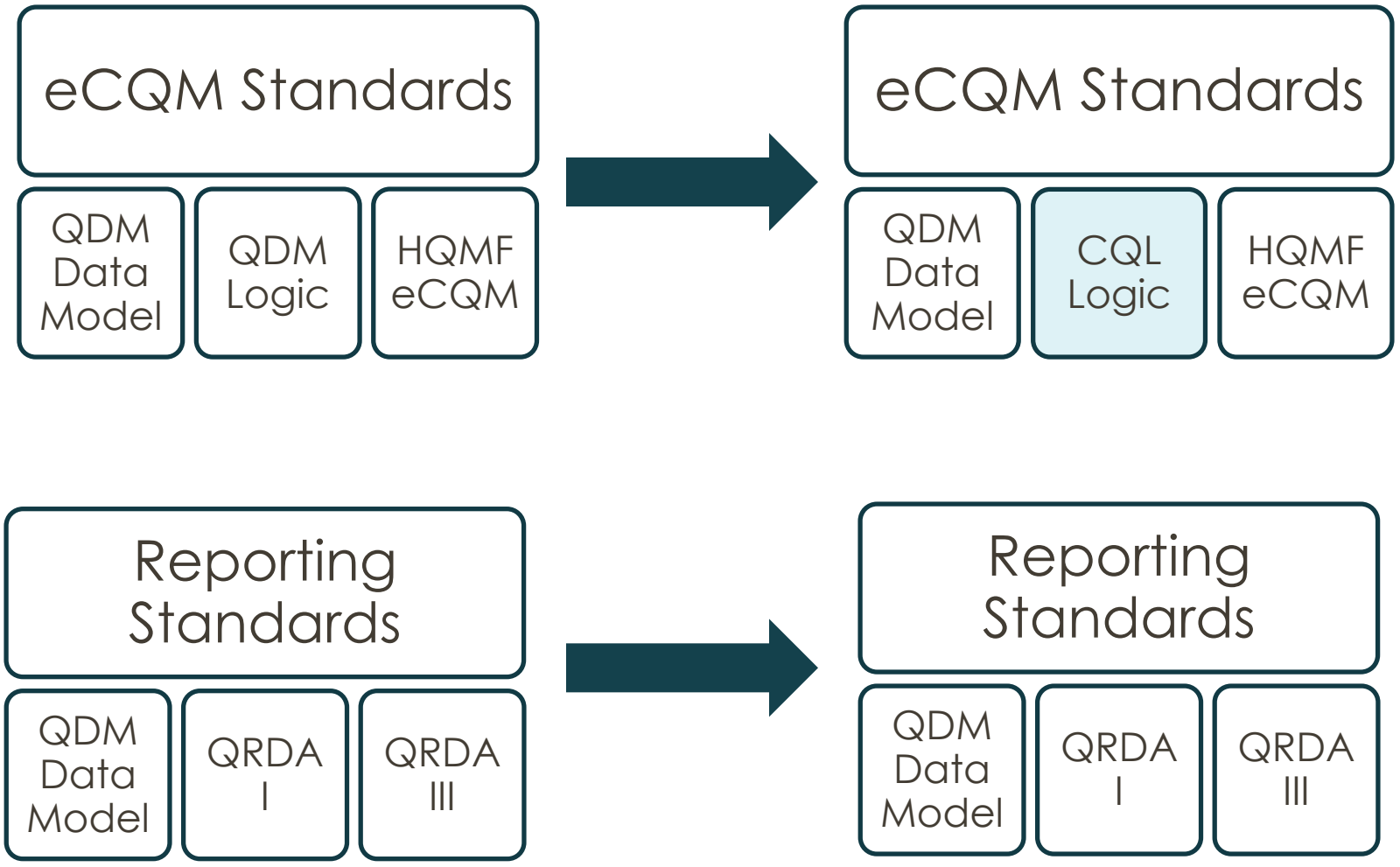
Phase 1 Standards Change



Two stage implementation:

- **Stage 1:** Test CQL from Q3 2016 – Q3 2017
- **Stage 2:** Implement CQL in production, Q3 2017
- Measures using CQL published in Q2 2018 (Annual Update 2018)
- Apply to data collected over Reporting Year 2019
- Report submission Q1 2020

Phase 1: Measure Implementation

Impact	• eCQMs are being rewritten to use CQL logic • Measure developers are learning CQL and new measure authoring paradigm • New human readable format due to CQL syntax • Processing and calculation engines will be ported to CQL

Phase 1: Measure Implementation

Benefits	• Logic reuse and sharing across measures • Reduced measure maintenance burden • Reduced burden for standards developers and maintainers • Simpler, more straightforward logic • True machine computability and execution

Phase 1: Measure Reporting

No Impact	• QRDA I and III still used for Quality Reporting • Quality Reporting has no impact from change to using CQL logic

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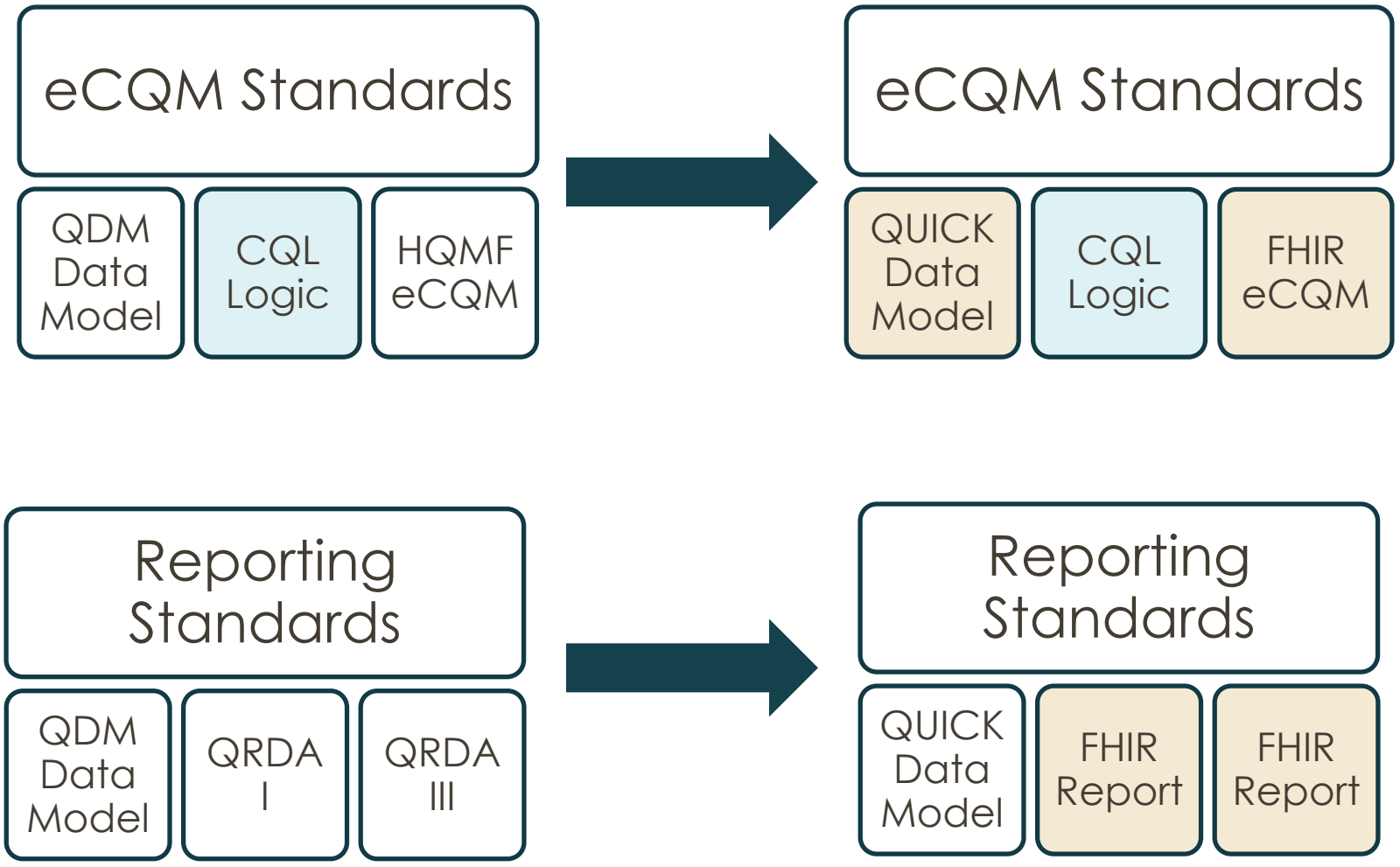
Phase 2 Standards Change



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Phase 2: Timeline

No proposed timeline at this time

Depends on:

- Maturity and adoption rate of FHIR across the industry
- Readiness of FHIR-based quality standards
- Results of Phase 1 implementation
- Implementer fatigue due to Phase 1

Phase 2: Measure Implementation

Impact	• eCQMs will be updated to use the QUICK Data Model and FHIR eCQM Resource • Learning curve to use QUICK vs QDM • Measure processing and calculation engines will need updates

Phase 2: Measure Implementation

Benefits	• Common Data Model will encourage shared logic across measures, decision support rules, others • Possibility of developing a common library of often used logic/data criteria • Further reduces maintenance burden • Reduced burden on standards developers and maintainers • Simpler eCQM structure vs. HQMF • Move to common FHIR based standards consistent with industry shift

Phase 2: Measure Reporting

Impact	• Validation tooling will need updates • Vendor software exports will need to produce FHIR instead of QRDA • Centers of Medicare and Medicaid (CMS) Quality Program reporting guides will require updates • Pre-Submission Validation Application and testing tools will need updates • Certification and related tooling will need updates

Phase 2: Measure Reporting

Benefits	• Simpler measure reporting format vs. QRDA • Reduced data validation burden on agencies like CMS • Reduced burden on standards developers and maintainers • Reduced reporting burden on implementers • Move to common FHIR based standards consistent with industry

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Summary

Current standards for quality are in transition

New standards for quality harmonize CDS and CQM

- Expect a two phased transition to the new standards
  - Phase 1: Move to CQL for Measure Logic
  - Phase 2: Move to QUICK and FHIR for data
- Phase 1 is being implemented currently
- Phase 2 does not have a proposed timeline yet
- Will affect vendors, developers, implementers, and quality reporting agencies

Conclusions

Cost of transition to new standards will be high

Long-term benefits greatly outweigh the initial cost:

- Automate and simplify many currently manual tasks
- Reduces implementation burden and learning curve
- Reduces long term maintenance burden across the board
- Encourages sharing of artifacts across several domains

Stronger tools to improve delivery of healthcare

Centralized Resource for all things related to eCQMs:

http://ecqi.healthit.gov

- Current and future eCQM specifications
- Links to HL7 standards
- Information on CMS reporting programs
- Training videos and webinars

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QUESTIONS?