Health IT Enabled Quality Measurement and Improvement: The HL7 Clinical Quality Information Workgroup

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Evolution of Quality Measurement

- For years a paper-based, manual-intensive process
- Electronic claims processing → new ways to perform quality measurement
- EHRs → automating process of extracting, calculating, and reporting quality measures
- National quality initiatives have moved to retool paper-based measures to an electronic format
- Major national programs have adopted and require use of electronic standards for quality measurement reporting (eMeasures or eCQMs) – CMS/Medicare (PQRS, Meaningful Use), Joint Commission, NCQA
- Under 2015 MACRA, CMS to align national quality measurement programs (including MU, PQRS, others) into new Merit-based Incentive Payment System
Who are all the players in the Quality space?

- **Policy Directions on Quality**
  - National Priorities Partnership, National Quality Strategy, CMS, ONC

- **Measure Requesters**
  - External demands of quality measures for accountability (CMS, NCQA, PCPI, Joint Commission)
  - Internal demands for quality measures for improvement (quality improvement programs)

- **Measure Developers**
  - National Quality Forum, Measurement Development Partnership

- **Standards Developers**
  - HL7, IHE, IHTSDO, Others

- **EHR/Tool Developers**
  - EHR vendors, quality reporting tool developers

- **Measure Reporters and Users**
  - Providers, Health Plans, Public Programs, Others
HL7 Clinical Quality Information Workgroup

- HL7 has worked on quality measurement and reporting standards for years
- Mostly done within the Structured Documents Workgroup
- Since 2010, significant work being done to enhance the standards for quality measurement and reporting using data from EHRs
- In 2012, HL7 formed the Clinical Quality Information Workgroup
- It’s mission:
  
  *Create and maintain information technology standards in support of improving health care quality, and to foster collaboration between quality measurement, outcomes and improvement stakeholders.*
HL7 CQI Workgroup

- Broad Participation
  - Providers/Clinicians, Payers, Government Agencies, Accrediting Bodies, Vendors, Measure Developers, Measure Implementers, Quality Improvement Organizations

- Cross-Collaboration
  - With other HL7 Workgroup
    - Clinical Decision Support (CDS), Structure Documents (SD), Patient Care, Electronic Health Record (EHR), Public Health and Emergency Response (PHER), Fast Healthcare Interoperability Resource (FHIR), Others
  - With other industry groups
    - IHE, ISO, IHTSDO, LOINC, S&I Framework’s Clinical Quality Framework, NQF, CMS, NCQA, Joint Commission, Others
Health IT-enabled Quality Measurement and Improvement Ecosystem

RESEARCH
What's ACTUALLY Happening
Why?

GUIDELINES
What SHOULD Happen
What do we want to happen?

CLINICAL DECISION SUPPORT
How to MAKE IT Happen

CLINICAL CARE
Clinician and Patient Workflow

REPORTING
Patient, provider, population, public

- quality
- safety

MEASUREMENT/ANALYTICS
What DID Happen
What is happening now?
Types of Data Re-Use

- Public Health and Population Health Management
- Research
- Quality Improvement
- Financial and Operational Improvement
- CLINICAL CARE
  - Clinician and Patient Workflow

Data Concurrence
# CQI: Shared Standards
Clinical Quality Measurement and Clinical Decision Support

<table>
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<tr>
<th>Electronic Clinical Quality Measures (eCQMs)</th>
<th>Clinical Decision Support (CDS)</th>
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<tr>
<td><strong>Measure Structure</strong></td>
<td><strong>CDS Structure</strong></td>
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<td>• Health Quality Measure Format (HQMF)</td>
<td>• Health eDecisions (HeD)</td>
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<td><strong>Reporting Structure</strong></td>
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<td>• Quality Reporting Document Architecture (QRDA)</td>
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<td>• Single Patient: Category-I</td>
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<tr>
<td><strong>Measure Data</strong></td>
<td><strong>CDS Data</strong></td>
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<td>• Quality Data Model (QDM)*</td>
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<td><strong>Measure Logic</strong></td>
<td><strong>CDS Logic</strong></td>
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* Data Model (QDM) is a conceptual data model managed by CMS
CQI: Shared Standards
Clinical Quality Measurement and Clinical Decision Support

**eCQMs**

**Measure Structure**
- HQMF

**Reporting Structure**
- QRDA
  - Single Patient: Category-I
  - Aggregate: Category-III

**Measure Data**
- QDM

**Measure Logic**
- QDM/HQMF

**CDS**

**CDS Structure**
- HeD

**CDS Data**
- vMR

**CDS Logic**
- HeD
CQI: Shared Standards
Clinical Quality Measurement and Clinical Decision Support

Structure – FHIR Clinical Reasoning Module:
Measure, Measure Report and Clinical Decision Support Artifact

- Standard Description of Title, Author, Purpose
  HL7 Common Metadata Standard

- Common Method to Describe Health Data (Data Model)
  HL7 QI Core → US Core (Data Access Framework) Evolving Toward Clinical Information Modeling Initiative

- Common Method to Express Logic
  HL7 Clinical Quality Language (CQL)
Quality Infrastructure - Vision

Quality Content
- Data definition
- Harmonized Data Model (QUICK)
- Values/Value Sets (VSAC)
- Expression Logic (CQL)

Quality Structure
- Clinical Reasoning (FHIR)
  - Measure
  - Clinical Decision Support

EHR Software
- Enable Clinical Improvement
- Capture and Retrieve Data (measure requirements)
- Analyze Data

Measure Report
- Clinical Reasoning (FHIR) or Other Format
  - Individual Report
  - Aggregate Report
Measure Development – HL7 Sequencing Roadmap

2016
- QDM v4.2 & HQMF 2.1
  Develop

2017
- Ballot HQMF R1 Normative
- Testing CQL (DRAFT 5.0) & HQMF 2.1
  Test Development

2018
- Measures using QDM v4.3 & HQMF 2.1
  Develop
- Implement
- Report

2019
- Measures using CQL - QDM 5.0 & HQMF R1 Normative
  Develop
- Implement
- Report

- Ballot QDM-based HQMF IG for QDM 5.0 & HQMF R1 Normative
- Re-Ballot CQL-based HQMF & HQMF R1 Normative

FHIR-based Harmonization Standards (CQF on FHIR, QUICK, etc.)

a – Measure Structure – HQMF (Note: Normative HQMF R1 ballot January 2017)
b – QDM-based HQMF
c – CQL-based HQMF
d – Measure Report – QRDA Category I (individual report), QRDA Category III (aggregate report)

DISCLAIMER
• This timeline represents the anticipated/target dates of incorporation or update of standards used in the annual update of eCQMs
• It is not intended to represent any Federal agency ruling or regulation dates
Evolving Standards / Data Model

CQI Workgroup (CDS Workgroup Co-Sponsor)

QDM (Quality Data Model)

vMR (Virtual Medical Record)

QiDAM [Quality Data Analysis Model (Conceptual Model)]

QI CORE / QUICK [Quality Information for Clinical Knowledge]

US CORE [“Version 1” – Common Clinical Data Set]

Data Access Framework

US Realm Task Force

US CORE represents the base set of data that can be expected to be shared in structured form by all EHRs. Such a Core set needs to evolve over time. QI CORE / QUICK includes additional elements that should, over time, be able to migrate into the US CORE. Such a mechanism must exist.
US CORE “Version 1” is composed of only the Common Clinical Data Set. A full description of the process and “on ramp” to update and evolve US Core will be provided by the US Realm Task Force.
Current Use of CQI Standards and Artifacts

- **HQM/QRDA and CMS QDM:**
  - Used to represent eMeasures (eCQMs) and transmit EHR-based data for CMS health care quality programs
    - EHR Incentive Program (Meaningful Use)
    - Hospital Inpatient Quality Reporting Program
    - Physician Quality Reporting System (PQRS)
    - Comprehensive Primary Care (CPC) Initiative
    - Pioneer ACO Program
  - Starting in 2017, QRDA-I no longer accepted by CMS for eligible clinician data (only accepted from hospitals)
  - Also used in accreditation programs (Joint Commission, NCQA)
  - Emerging use of HQMF/QDM/MAT in the Netherlands

- **Other Standards - CQL, FHIR Quality (QI Core/QUICK), FHIR Clinical Reasoning**
  - Expected to be adopted and used in future iterations of quality measurement programs
CQI: Current Projects

Active Standards from January 2017 Cycle
- HQMF R1 Normative
- CQL-based HQMF

Additional CQI Standards:
- CQF Data Model (with CIMI)
- QRDA Category I, Release 1, DSTU Release 4
- QRDA Category III, Release 2
- HQMF R2.1
- QDM-based HQMF, R1.3
- CQL-based HQMF, R1
- Clinical Quality Data Sharing User Guide
- FluentPath – Alignment of FHIRPath with CQL (Co-sponsor)
- FHIR Clinical Reasoning (with CDS)
- FHIR Quality (QI Core / QUICK)
- CQL (with CDS)
- Quality Metadata (with CDS)
How to Participate

- **CQI Workgroup**
  - Weekly calls: Fridays, 1:00 – 3:00 pm ET
  - F2F Working Group Meetings (x3/year)
    - FHIR-based Clinical Content Implementers: FHIR-cri@lists.HL7.org
    - HL7 Standards for Clinical Quality Measurement and Reporting hqmf-qrda@lists.HL7.org
  - Website: [http://www.hl7.org/Special/committees/cqi/index.cfm](http://www.hl7.org/Special/committees/cqi/index.cfm)
  - Ballot review/comment: [http://www.hl7.org/participate/onlineballoting.cfm?ref=nav](http://www.hl7.org/participate/onlineballoting.cfm?ref=nav)
CQI White Papers

- A Framework for Standards
  - Identifies and describes how various electronic standards meet the needs of end-to-end workflow for quality measurement and clinical decision support

- QRDA Clinical Quality Data Sharing User Guide
  - Provides use cases for the application of QRDA standard to exchange clinical quality data
Quality Data Model (QDM)

- Quality Data Model
  - A model of information used to describe clinical concepts in a standardized format to enable clinical quality measurement
  - Describes the data elements and states (or contexts) in which data elements are expected to exist in clinical information systems
  - Not an HL7 standard but has been implemented in HQMF and QRDA
Health Quality Measure Format (HQMF - eMeasure, eCQM)

- The first international standard for the formal representation of a clinical quality measure as an electronic document (including metadata, data elements, and logic)
- Provides for quality measure consistency and unambiguous interpretation
- An eMeasure (also known as an eCQM) is a quality measure encoded in HQMF format
- QDM-based HQMF (R1.3)
- CQL-based HQMF (R1)
QRDA

- Quality Reporting Document Architecture
  - A standard for reporting patient or aggregate quality data for one or more quality measures
    - QRDA Category I – Single Patient Report
    - QRDA Category II – Patient List Report*
    - QRDA Category III – Aggregate Report

* QRDA Category I and III are Standards for Trial Use (STU). QRDA Category II is not a STU.
QRDA Category I

- Single Patient Reports
  - Individual patient-level report containing data defined in an electronic clinical quality measure
  - Clinically measureable parameters are assembled into quality measures, which are then expressible as eMeasures
  - eMeasures guide the collection of EHR and other data, which are then assembled into QRDA quality reports and submitted to quality organizations
  - Version: R3.1
QRDA Category III

- **Aggregate Reports**
  - An aggregate quality report that contains calculated summary data for one or more measures for a specified population of patients within a particular health system over a specific period of time
  - Communicates data residing in health information systems that are stripped of all patient identifiers, protecting patients and healthcare providers from the risks of inadvertent leakage of private information
  - Version: R1.1
QUICK

- Quality Improvement and Clinical Knowledge (QUICK)
  - Logical model that represents patient-centric clinical concepts for the purpose of clinical decision support and clinical quality measures
  - Describes the use cases and requirements of a data model for quality improvement
  - Provides a standard way to reference information in EHRs
  - Learns from and builds upon existing standards (e.g., QDM, QRDA, etc.)
CQL

- **Clinical Quality Language (CQL)**
  - Defining canonical representation of expression logic for clinical quality
  - Drawing on the requirements of the QDM, HQMF, CDS Knowledge Artifact Specification and QUICK
  - Also defining a mechanism for enabling the point-to-point sharing of clinical knowledge
  - Also defining a conformance profile of a human-readable syntax targeted for measure and decision support artifact authors
  - Version: 1.0
FHIR QI CORE

- An Implementation Guide
- An overarching efforts that includes several projects focusing on developing Fast Healthcare Interoperability Resources (FHIR) artifacts needed for quality measurement and clinical decision support
  - FHIR Quality Profile
  - CQF on FHIR
- Approach aims to derive the QUICK logical model from FHIR profiles
- Version: 1.1