Advancing Technology for Quality Reporting at CMS: Burden Reduction and FHIR

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Learning Objectives

• Understand the benefits of Fast Healthcare Interoperability Resources (FHIR) for quality reporting

• Identify resources available to find information about FHIR for quality reporting

• Describe how FHIR can replace current standards for electronic quality data capture and reporting

• Understand CMS’ roadmap for transition to FHIR for quality
Agenda

• Burden Reduction for Electronic Clinical Quality Measure (eCQM) Implementation & Reporting

• Why FHIR?

• FHIR Roadmap

• FHIR for Quality

• Current FHIR Pilot and Outcomes

• Readiness Discussion
Burden Reduction
Why FHIR?
Why FHIR?

Why eCQMs?

• Chart abstracted measures require time consuming review of structured and unstructured data sources by clinical staff
  - Difficult to perform “apples to apples” comparison at scale and across different organizations
  - Chart abstracted data is not easily transferrable and recorded into a medical record across providers and care settings

• eCQMs create a quality improvement goal for quality measurement and initiatives
Why FHIR? Using eCQMs

• eCQMs use **structured**, electronically-captured patient data
  - Structured data requires common understanding of data and data standards
  - EHR data must be mapped to data standards

• Standardization requires infrastructure investment, education, and workflow changes

• eCQMs are now part of several different CMS quality reporting programs

• eCQMs are expected to be added to more programs in the near future
Why FHIR?
Current Quality Measurement Standards

• Quality Data Model (QDM)

• Health Quality Measure Format (HQMF)

• Clinical Quality Language (CQL) – as of calendar year 2019 reporting

• Quality Reporting Document Architecture (QRDA)

• Standard terminologies, e.g.,
  - SNOMED CT
  - LOINC® - Logical Observation Identifiers Names and Codes
  - RxNorm
  - ICD-10-CM - International Classification of Diseases, Tenth Revision, Clinical Modification
Why FHIR?
eCQM Strategy Project

• eCQM Strategy Project Goals
  - Reduce Burden
  - Increase Value
  - Increase Stakeholder Involvement

• Project Scope
  - Measure Development process from concept to the Measures Under Consideration (MUC) list
  - Electronic Clinical Quality Reporting requirements and processes from eCQM implementation to submission
  - Tools for Development and Reporting

• eCQM Strategy Project Recommendations
  - Focused on Alignment, Value, Development Process, Implementation and Reporting Processes, EHR Certification Process, and Education & Outreach
  - Included enhancements to the Electronic Clinical Quality Resource Center and development of the Measure Collaboration Workspace
User Feedback Questions

Respond by 8/8/2020 at https://www.menti.com/dtti9su3mk or scan
Readiness Discussion

Rank 5 potential sources of burden for eCQMs

1st | Mapping EHR data to standards
2nd | Capturing valid reasons for actions not done (i.e., negation rationale)
3rd | Describing imaging results
4th | Mapping terminology/value sets
5th | Re-entering existing data
6th | Other

Respond by 8/8/2020 at https://www.menti.com/dtti9su3mk or scan
Why FHIR?
eCQM Strategy Project

**ECQM STRATEGY RECOMMENDATIONS**
- eCQM reporting requirements across CMS program care settings
- eCQM specifications, value sets, and data collection

**COMMUNICATION, EDUCATION, AND OUTREACH**
- Coordinated education and outreach campaigns to learn from stakeholders and share CMS program information
- Measure-level webinars
- Clear eCQM guidance, plain language, and improved website usability

**EHR CERTIFICATION PROCESS**
- eCQM certification aligned with CMS reporting requirements

**ALIGNMENT**
- eCQM Strategy Goals
  - Reduce burden
  - Increase value
  - Increase stakeholder involvement

**VALUE**
- Quality dashboard best practice collaboration between providers and CMS
- Data element definitions

**DEVELOPMENT PROCESS**
- Collaborative Measure Development Workspace
- Data element repository
- Clinically feasible workflow for data capture
- Feasibility testing for new data elements

**IMPLEMENTATION AND REPORTING PROCESSES**
- Clear eCQM specifications, tools, and resources
- Feasible data elements
- Submission of data elements and eCQMs with FHIR and APIs
- Use of eCQM standards to support interoperability
- Consolidated pre-submission validation testing tools
- eCQM attribution research and pilots
Measure Collaboration Workspace

- Hosted on the eCQI Resource Center (https://ecqi.healthit.gov/)
- Contains a set of interconnected resources, tools, and processes for eCQMs
- Promotes transparency and better interaction across stakeholder communities interested in developing and implementing more harmonized, accurate, and meaningful eCQMs
eCQM Data Element Repository

• Now includes information for eCQMs used in CMS Quality Programs for the 2021 Performance and Reporting Periods
• Aids in data mapping activities by providing measure information and data element definitions for all the available CMS program eligible hospital/critical access hospital and eligible professional/eligible clinician measures
• Centralizes information from:
  - Value Set Authority Center (VSAC)
  - eCQM specification
  - Quality Data Model
Why FHIR?
Burden Reduction and Benefits of FHIR

• Reduces Burden:
  - Aligns CMS eCQM reporting with industry clinical data exchange framework, reducing implementation burden
  - Enables automated data retrieval from EHR and submissions of quality data through use of standards-based application programming interfaces (APIs)

• Simplifies Data Mapping:
  - Single mapping to FHIR vs. mapping to both HQMF and QRDA

• Improves Alignment between eCQMs & Clinical Decision Support (CDS):
  - Both use a common FHIR data model (QUICK/FHIR QI Core)

• Promotes Interoperability:
  - Data Exchange Requirements for Quality Measurement are aligned with interoperability standards used in other healthcare exchange
CMS FHIR Roadmap
&
Current Activities
Reducing burden through streamlined data exchange for eCQM quality reporting.

**Standards Development**
- FHIR Measure IG
- Data Exchange for Quality Measurement IG
- QI Core/QUICK

**Testing and Pilots**
- HL7 FHIR Connectathons
- CMS Connectathon
- CMS FHIR Pilot
- Pre-Testing with Health IT Vendors

**CMS Receiving System Updates**
- CMS Receiving System Development
- FHIR APIs

**eCQM Conversion**
- QDM/CQL to FHIR/CQL
- FHIR STU3 Conversion
- FHIR R4 Conversion

**Tool Configuration**
- Measure Authoring Tool
- FHIR Development
- Bonnie FHIR Development
- Cypress FHIR Development

**FHIR Quality Reporting**
- Centralized CMS Quality Submission Solution
  - Dependent on FHIR testing results

Continuous focus on stakeholder engagement, human-centered design, education and outreach.
FHIR Activities in Progress

• Mapping QDM to FHIR (QI-Core)
  - Detailed mapping of all QDM datatypes and attributes to QI-Core resources and attributes to assure comprehensive coverage of data required for eCQM conversion
  - Update to QDM 5.5 recommendations to avoid usage of elements found to be problematic (i.e., missing in FHIR due to lack of real-world usage)

• FHIR Version of Measure Authoring Tool (MAT) and Bonnie
  - Development of FHIR versions of MAT and Bonnie to support FHIR eCQM authoring and testing
    • MAT on FHIR is currently undergoing user acceptance testing with planned beta version release late Summer 2020
    • Bonnie on FHIR beta version planned for release late Fall 2020
FHİR Activities in Progress (cont’d.)

• FHİR eCQM Conversion
  - Converted a subset of existing 2020 & 2021 eCQMs to FHİR STU 3 and R4 for measure developer education and testing purposes

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<th>Converted to FHİR STU 3</th>
<th>In-Progress to FHİR STU 3</th>
<th>Converted to FHİR R4</th>
<th>In-Progress to FHİR R4</th>
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FHIR for Quality
Common Standards can reduce burden by:

- Aligning Clinical Systems with data needed for quality measurement
- Streamlines exchange of data by using a common interoperability framework
- Accelerates the adoption of measures by reducing the effort to map to clinical systems
# FHIR for Quality

## Evolving Quality Measurement Standards

### Current eCQM Standards
- QDM Data Model
- CQL Logic
- HQMF eCQM

### Possible Future eCQM Standards
- QI-Core Data Model
- CQL Logic
- FHIR eCQM

### eCQM Reporting
- QDM Data Model
- QRDA I
- QRDA III

### Possible Future eCQM Reporting
- QI-Core Data Model
- FHIR Report Individual
- FHIR Report Summary
FHIR for Quality
The eCQI Resource Center https://ecqi.healthit.gov/fhir

Fast Healthcare Interoperability (FHIR®)

Receive updates on this topic

FHIR® is an open-source Health Level Seven International (HL7®) standard for exchanging patient health information that is intended to facilitate the exchange of health information electronically between various stakeholders in the healthcare system. FHIR® allows for the representation of patient data in different ways, such as medications, encounters, etc., and is being adopted by the healthcare community to support the exchange of patient data. It is designed to be used by software systems and applications that are used to collect, store, and manage patient data. FHIR® is a flexible standard, allowing for the development of new applications and services.

FHIR Quality Measurement

The healthcare community and CMS are exploring a potential transition to FHIR-based quality measurement beginning with research and development.
# FHIR for Quality

The eCQI Resource Center [https://ecqi.healthit.gov/fhir](https://ecqi.healthit.gov/fhir)

## Fast Healthcare Interoperability Resources (FHIR®)

*Receive updates on this topic*

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<th>About</th>
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<td>• <strong>Introducing HL7 FHIR for Implementers webinar (PDF)</strong> - January 22, 2020</td>
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<td>• HL7® FHIR 101 Cooking with Clinical Quality Language (CQL®) webinar - September 26, 2019</td>
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<td><a href="https://ecqi.healthit.gov/fhir">Access FHIR® Resources</a> - January 22, 2020</td>
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FHIR for Quality
QI-Core- Data Model

• Quality Improvement implementation guide (IG) for FHIR, focused on data elements used in eCQMs and CDS

• Aligns with US Core where possible (e.g., Encounters)
  - Profiles FHIR where US Core doesn’t specify (e.g. CommunicationRequest)

• Includes mappings from QDM to enable transition of existing quality measures
  - QDM has evolved to align with FHIR and QI-Core

• Adds additional constraints and extensions commonly used in measures
  - Value set additions
  - Negation Rationale
  - New profiles for authoring eCQMs/CDS
FHIR for Quality
Quality Measure IG

- FHIR Measure resource replaces HQMF to define the eCQM structure
  - QI Core resources replace QDM Datatypes
Readiness Discussion

Would you rather model directly with FHIR QI-Core or the QUICK logical model?

0
FHIR QI-Core

0
QUICK Logical Model

0
Unknown

Respond by 8/8/2020 at https://www.menti.com/dtti9su3mk or scan
FHIR for Quality Data Exchange for Quality Measures (DEQM)

- Defines FHIR operations including $submit-data (push) and $collect-data (pull) to exchange clinical quality data
- MeasureReport resource replaces QRDA
- Subscription workflow to be included in quality implementation guides for FHIR R5

<table>
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<tr>
<th>Operation</th>
<th>Description</th>
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<td>$evaluate-measure</td>
<td>Calculation results for a single measure as a MeasureReport</td>
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<td>$data-requirements</td>
<td>List of data of interest for the quality measure as a Library</td>
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<tr>
<td>$submit-data</td>
<td>Submit a MeasureReport resource along with additional data of interest</td>
</tr>
<tr>
<td>$collect-data</td>
<td>Pull data of interest for measure contained in FHIR server as a MeasureReport</td>
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FHIR for Quality
DEQM – Push

Exchange initiated by the provider

EHR Clinical Database

Vendor FHIR Client

Quality Measurement System

FHIR Client

Authentication + Authorization

Authorization Token

Library Resource

$data$-requirements Operation

$submit-data Operation

Implements DEQM IG + OAuth 2

[69x386]Exchange
[66x369]initiated by
[62x353]the provider

[205x184]EHR Clinical
[195x166]Database

[332x260]Authentication + Authorization

[65x104]Implements
[504x138]DEQM IG +
Library Resource

[332x99]Authorization Token

[480x219]Authorization Token

[79x87]OAuth 2

[685x175]DEQM

–

Push

[28]
FHIR for Quality
DEQM – Pull

EHR Clinical Database

Vendor FHIR Client

Authorization + Authorization
Authorization Token
$collect-data, $evaluate-measure Operation, $data-requirements + FHIR Queries
MeasureReport Resource (+ Patient Resource)

Quality Measurement System

Exchange initiated by the quality measurement system

FHIR Client

Implements DEQM IG + OAuth 2
FHIR for Quality
Burden Reduction - Scenario
Current FHIR Pilot and Outcomes
Current FHIR Pilot and Outcomes
CMS/HL7 Joint FHIR Connectathon

• CMS hosted the first ever joint CMS/HL7 FHIR Connectathon January 7-8 2020

• Clinical Reasoning Track: demonstrate ways to reduce the burden in eCQM reporting through FHIR

• Focused on testing of FHIR eCQMs for submission of quality data to CMS
  - Measure Development- Using STU3 and R4 to express measures in CQL and FHIR
  - Measure Packaging- Measure definition, libraries, and terminology necessary for measure evaluation
  - Measure Evaluation- evaluating measures and exchanging data between EHR and CMS
Current FHIR Pilot and Outcomes
CMS/HL7 Joint FHIR Connectathon

• Connectathon Accomplishments:
  - Automated script for updating measure libraries when changes are made to CQL which leads to reduced time for testing
  - Successfully tested both FHIR STU 3 and R4 eCQMs
    • R4 eCQMs successfully tested: CMS104, CMS124 and CMS 125
  - Demonstrated FHIR measure evaluation and transmission of data from Cerner’s EHR to CMS through a FHIR API

• Next steps for future connectathon testing: convert additional measures for testing and bulk data transmission testing

• Upcoming virtual HL7 FHIR Connectathon September 9-11, 2020; for additional information visit the eCQI Resource Center News and Events
Current FHIR Pilot and Outcomes
CMS FHIR Pilot

• CMS Center for Clinical Standards and Quality conducted an initial FHIR pilot for quality reporting

• Planning and kick off began October 2019, with initial phase of pilot completed April 2020

• Partnered with EHR vendors to test eCQMs converted to FHIR R4, sending/receiving FHIR data elements and measure reports through a FHIR API
FHIR Pilot for CCSQ: Current State Submissions to CMS

Stakeholders submit to multiple quality programs with different measures, through multiple methods and formats. For example, the Quality Payment Program (QPP) electronic measures are selected per stakeholder, calculated by stakeholder or submitter, sent to a QPP specific system through a program specific format.

Stakeholders submit to multiple quality programs with different measures, through multiple methods and formats. For example, the Quality Payment Program (QPP) electronic measures are selected per stakeholder, calculated by stakeholder or submitter, sent to a QPP specific system through a program specific format.
FHIR Pilot for CCSQ: Future State Submissions to CMS

A successful FHIR pilot leads the way for stakeholders to submit to a centralized submission solution for quality reporting. The receiving system can then do the measure calculations and exchange data and results with applicable quality programs, removing the burden from the submitter.
Current FHIR Pilot and Outcomes
FHIR Pilot Testing

• Explore the use of FHIR for electronic quality data exchange
• Partner with vendors to test and identify future roadmap for FHIR use within CMS quality program
  - Cerner and Epic volunteered to participate in testing
• Assess industry readiness
• Explore and evaluate technical foundation for receiving and calculating measure data for use across multiple quality programs; stand up FHIR server at CMS
• Opportunity for CMS to lead the path of EHR data exchange for quality
Current FHIR Pilot and Outcomes

FHIR Pilot Outcomes

• Stood up FHIR server and infrastructure; completed a security assessment

• Two large EHR vendors committed to testing, Cerner and Epic

• Established data connection via FHIR API with Cerner

• Successfully received FHIR data elements and FHIR measure reports pushed from Cerner and Epic into FHIR pilot server and successfully calculated measure results for the following eCQMS in FHIR R4:
  - EC- CMS 130 Colorectal Cancer Screening
  - EC- CMS 124 Cervical Cancer Screening
  - EC- CMS 125 Breast Cancer Screening
  - EH- CMS 104 Discharged on Antithrombotic Therapy
  - EH- CMS 105 Discharged on Statin Medication
Current FHIR Pilot and Outcomes

FHIR Pilot: Future Considerations

• Additional future Pilots are needed to test at a larger scale (planned for Summer 2020):
  - Additional measures
  - Bulk Data
  - More testing partners

• Consider conducting program-specific pilots in order to demonstrate use of center-wide solution

• FHIR-based tools for measure development and testing are being created and all eCQMs will need to be re-specified into FHIR

• Policy and rule making implications and publication of the FHIR measure specifications
Readiness Discussion
Readiness Discussion

My EHR/clinical software is currently using the following version of FHIR

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Readiness Discussion

My practice/organization will upgrade to FHIR R4

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Respond by 8/8/2020 at [https://www.menti.com/dtti9su3mk](https://www.menti.com/dtti9su3mk) or scan [QR Code]
Readiness Discussion

What communication avenues do you rely on to stay up to date on FHIR activities?

Respond by 8/8/2020 at https://www.menti.com/dtti9su3mk or scan...
Readiness Discussion

I believe FHIR will reduce burden for eCQM reporting to CMS and am looking forward to using a FHIR API over creating and uploading QRDA files.

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Readiness Discussion

What additional education topics would you like us to provide?

Respond by 8/8/2020 at https://www.menti.com/dtti9su3mk or scan
Questions

• For questions regarding the Mentimeter poll items, please contact abacus-fhir@groups.mitre.org.

• For general quality related FHIR questions, please contact fhir@esacinc.com