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

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Burden Reduction
Why FHIR?

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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

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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

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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

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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

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User Feedback Questions

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

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Readiness Discussion

Mentimeter

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

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Why FHIR?
eCQM Strategy Project

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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

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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

eCQI RESOURCE CENTER

eCQMs — Electronic Clinical Quality Measures | Resources — Standards, Tools, & Resources | About — eCQI, CDS, FAQs Engage | Sign In — Manage Your Account | Enter keywords

MC Workspace

Measure Collaboration (MC) Workspace

About | eCQM Concepts | eCQM Clinical Workflows | eCQM Test Results | eCQM Data Element Repository

Electronic Clinical Quality Measure (eCQM) Data Element Repository (DERep)

The eCQM Data Element Repository (DERep) provides additional clarification for all the data elements associated with published and tested eCQMs used in CMS quality reporting programs as well as the definitions and clinical focus for each data element. An end user can filter information by data element, eCQM, QDM attribute, or QDM category and datatype data element.

The data elements provided are for use in eCQMs for 2019, 2020 and 2021 Performance and Reporting periods. Information contained within the DERep is derived from the eCQM specifications, Quality Data Model (QDM), and the Value Set Authority Center (VSAC). Each eCQM data element includes information about the value set or, the direct reference code (DRC), along with the QDM datatype, and the QDM attributes used by that data element. In the eCQMs for the 2019 Performance and Reporting period, QDM Version 5.3 information is displayed. In the eCQMs for the 2020 Performance and Reporting period, QDM Version 5.4 information is displayed. In the eCQMs for the 2021 Performance and Reporting period, QDM Version 5.5 information is displayed.

Year	Select a Filter Option	Search	Sort by	Order	
2021	- All Data Elements -		Title	Asc	Apply

Select a filter or search by term and click Apply to see results. Filter definitions are below:

eCQM Data Element

The eCQM data elements provide a listing of all data elements used in eCQMs for the selected CMS quality reporting and performance periods. Each eCQM data element includes information about the value set or the direct reference code, along with the QDM datatype and QDM attributes used by that data element.

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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

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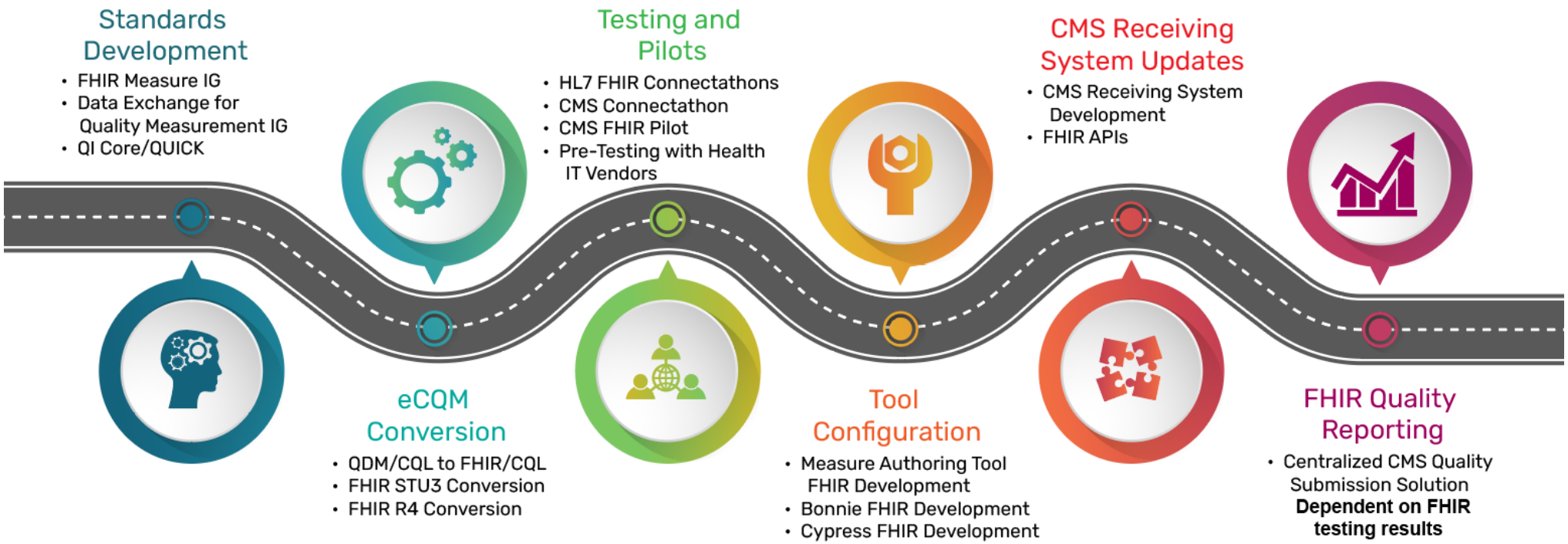
FHIR Quality Reporting Roadmap

Reducing burden through streamlined data exchange for eCQM quality reporting.



Continuous focus on stakeholder engagement, human-centered design, education and outreach.

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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

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FHIR Activities in Progress (cont'd.)

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

eCQM Conversion	Converted to FHIR STU 3	In-Progress to FHIR STU 3	Converted to FHIR R4	In-Progress to FHIR R4	In-Progress to FHIR R4.01
Eligible Hospital eCQMs	5	0	11	0	0
Eligible Clinician eCQMs	8	1	4	1	8

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FHIR for Quality

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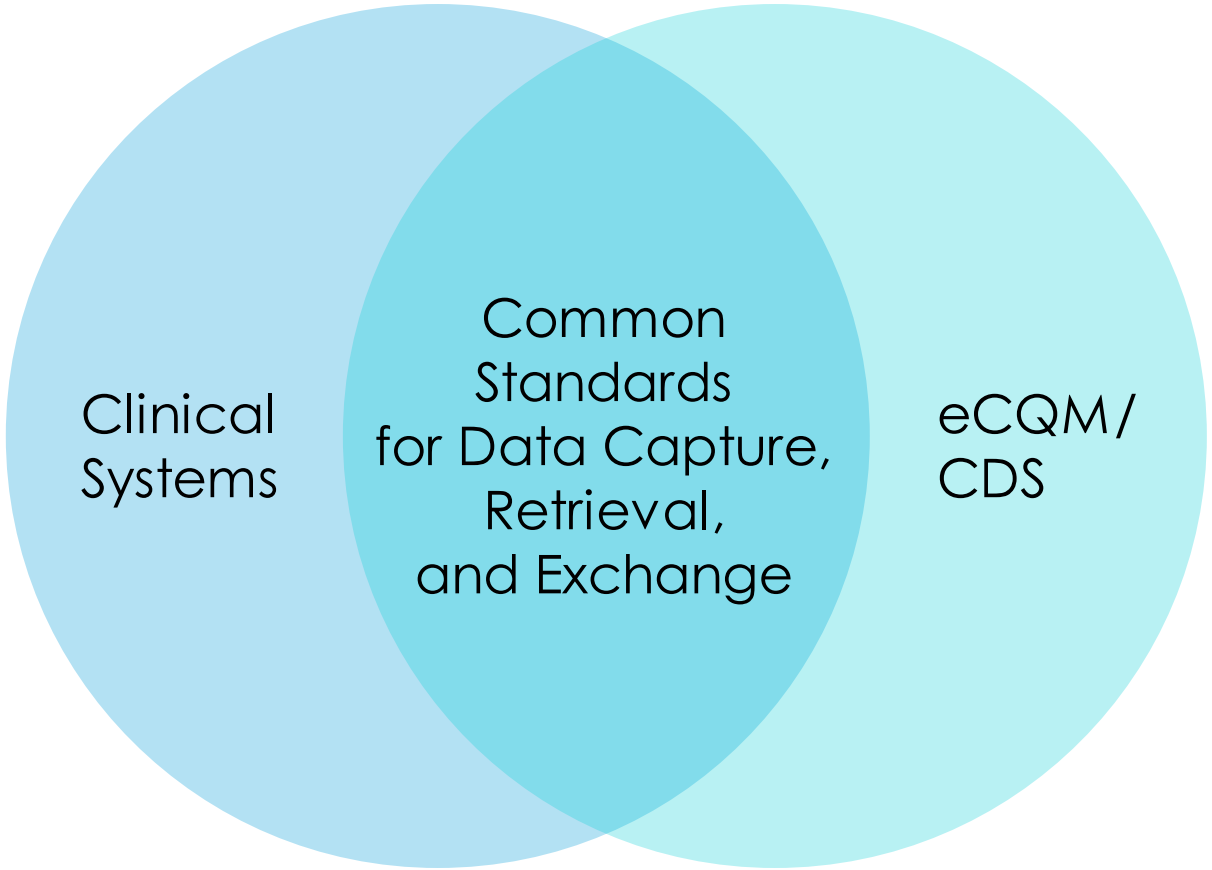
FHIR for Quality
Advancing Clinical Standards



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

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FHIR for Quality

Evolving Quality Measurement Standards

Current eCQM Standards			→	Possible Future eCQM Standards		
QDM Data Model	CQL Logic	HQMF eCQM		QI-Core Data Model	CQL Logic	FHIR eCQM

eCQM Reporting			→	eCQM Reporting		
QDM Data Model	QRDA I	QRDA III		QI-Core Data Model	FHIR Report Individual	FHIR Report Summary

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FHIR for Quality

The eCQI Resource Center https://ecqi.healthit/gov/fhir

https://ecqi.healthit.gov/fhir

eCQI
RESOURCE CENTER

eCQMs
Electronic Clinical Quality Measures

Resources
Standards, Tools, & Resources

About
eCQI, CDS, FAQs Engage

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Enter keywords

RESOURCES AND TOOLS

- eCQI Tools & Resources
- eCQM and eCQI Educational Resources
- eCQM Implementation Checklist
- eCQM Addendum Checklist
- Measure Collaboration (MC) Workspace

ECQI STANDARDS

- CQL (Clinical Quality Language)
- Fast Healthcare Interoperability Resources (FHIR®)
- HQMF (Health Quality Measure Format)
- QDM (Quality Data Model)
- QRDA (Quality Reporting Document Architecture)
- CDS/eCQM Harmonization

Fast Healthcare Interoperabilit
(FHIR®)

Receive updates on this topic

About | Tools & Resources

FHIR is an open-source Health Level Seven International (HL7®) standard for exch
next generation exchange framework being adopted by the healthcare community to ad
) represent patient data in different ways (e.g., medications, encounters). FHIR provides a means for representing and sharing information among clinicians and organizations in a standard way regardless of the ways local EHRs represent or store the data. FHIR combines the best features of previous standards into a common specification, while being flexible enough to meet needs of a wide variety of use cases within the healthcare ecosystem. FHIR has a heavy focus on implementation and uses the latest web technologies to aid rapid adoption.

FHIR Quality Measurement

The healthcare community and CMS are exploring a potential transition to FHIR-based quality measurement beginning with research and

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FHIR for Quality

The eCQI Resource Center https://ecqi.healthit/gov/fhir

Fast Healthcare Interoperability Resources (FHIR®)

Receive updates on this topic

About | Tools & Resources | Education | Connect

- Introducing HL7 FHIR for Implementers webinar (PDF) - January 22, 2020
  - Slides (PDF)
  - Transcript (PDF)
  - Transcript of Qs&As (PDF)
- eCQI Resource Center Highlight: FHIR® Standard and Collaborative Measure Development Workspace (PDF) - November 18, 2019
- HL7 FHIR 101 Cooking with Clinical Quality Language (CQL) webinar - September 26, 2019
  - Slides (PDF)
  - Transcript of Q&As (PDF)
- Office of the National Coordinator (ONC) Fact Sheets

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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

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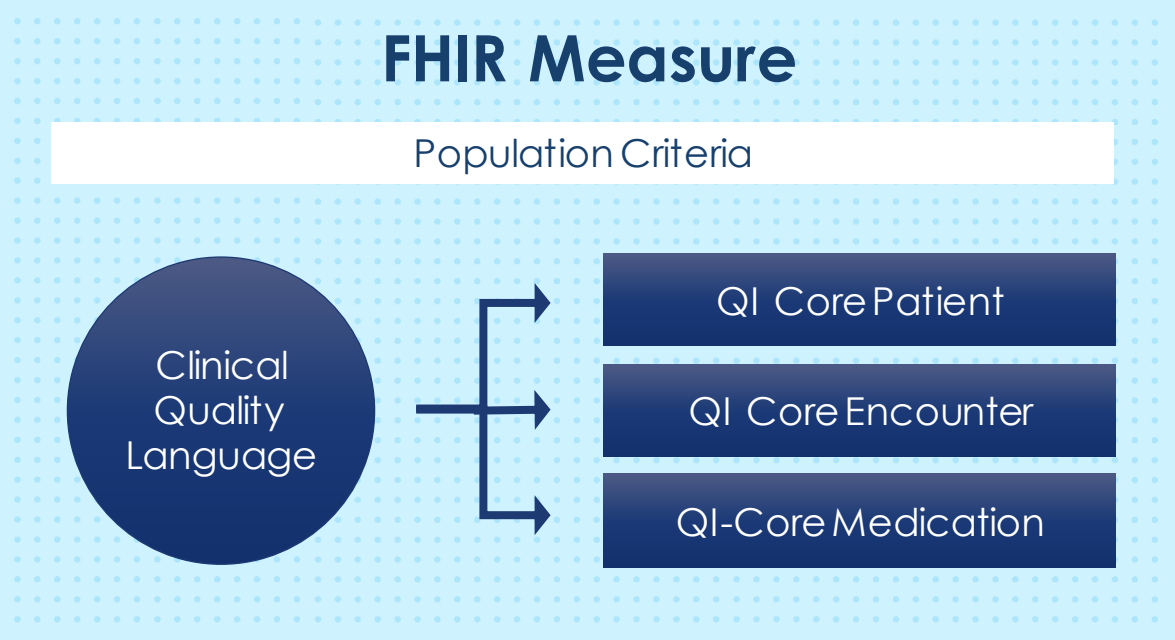
FHIR for Quality

Quality Measure IG

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



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Readiness Discussion

Mentimeter

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

0	0	0
FHIR QI-Core	QUICK Logical Model	Unknown

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

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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

Operation	Description
$evaluate-measure	Calculation results for a single measure as a MeasureReport
$data-requirements	List of data of interest for the quality measure as a Library
$submit-data	Submit a MeasureReport resource along with additional data of interest
$collect-data	Pull data of interest for measure contained in FHIR server as a MeasureReport

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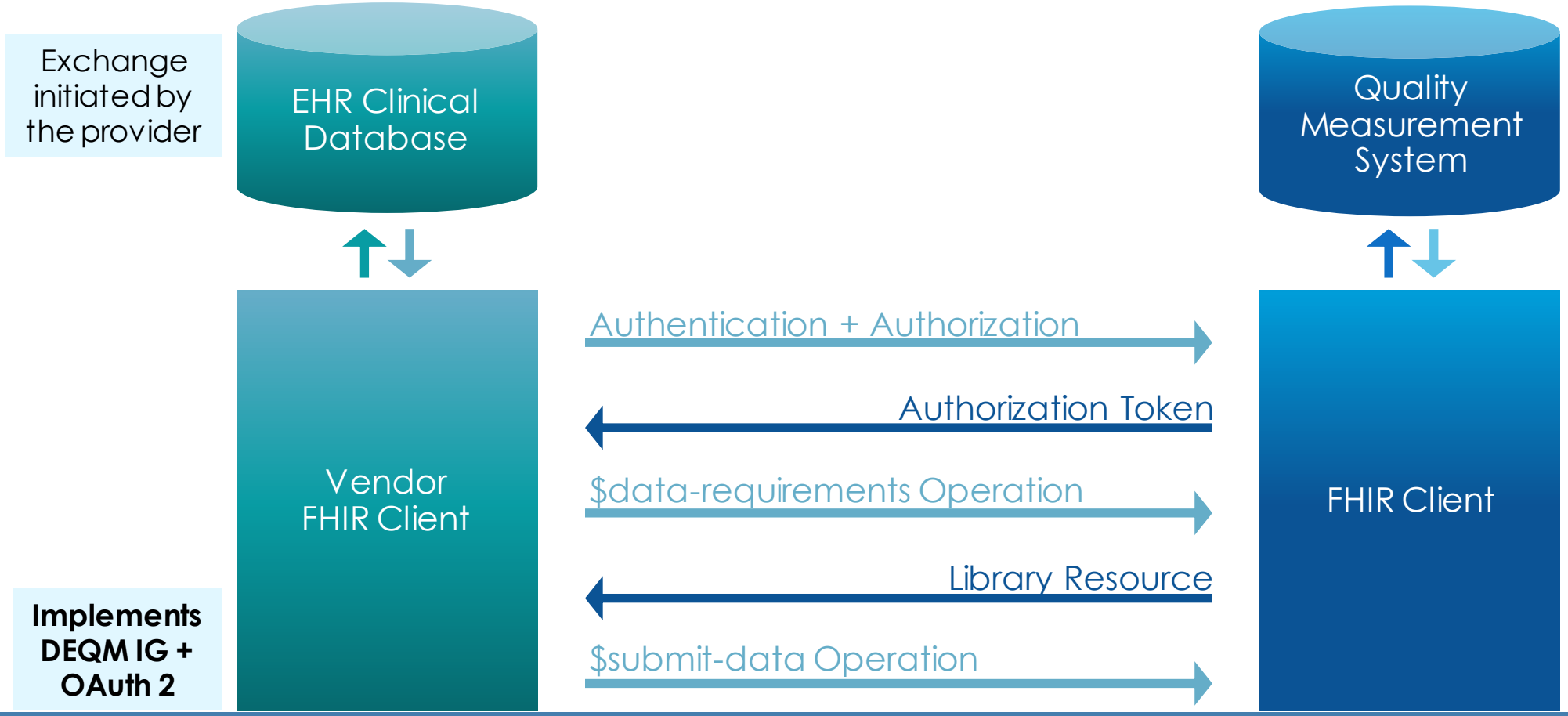
FHIR for Quality
DEQM – Push



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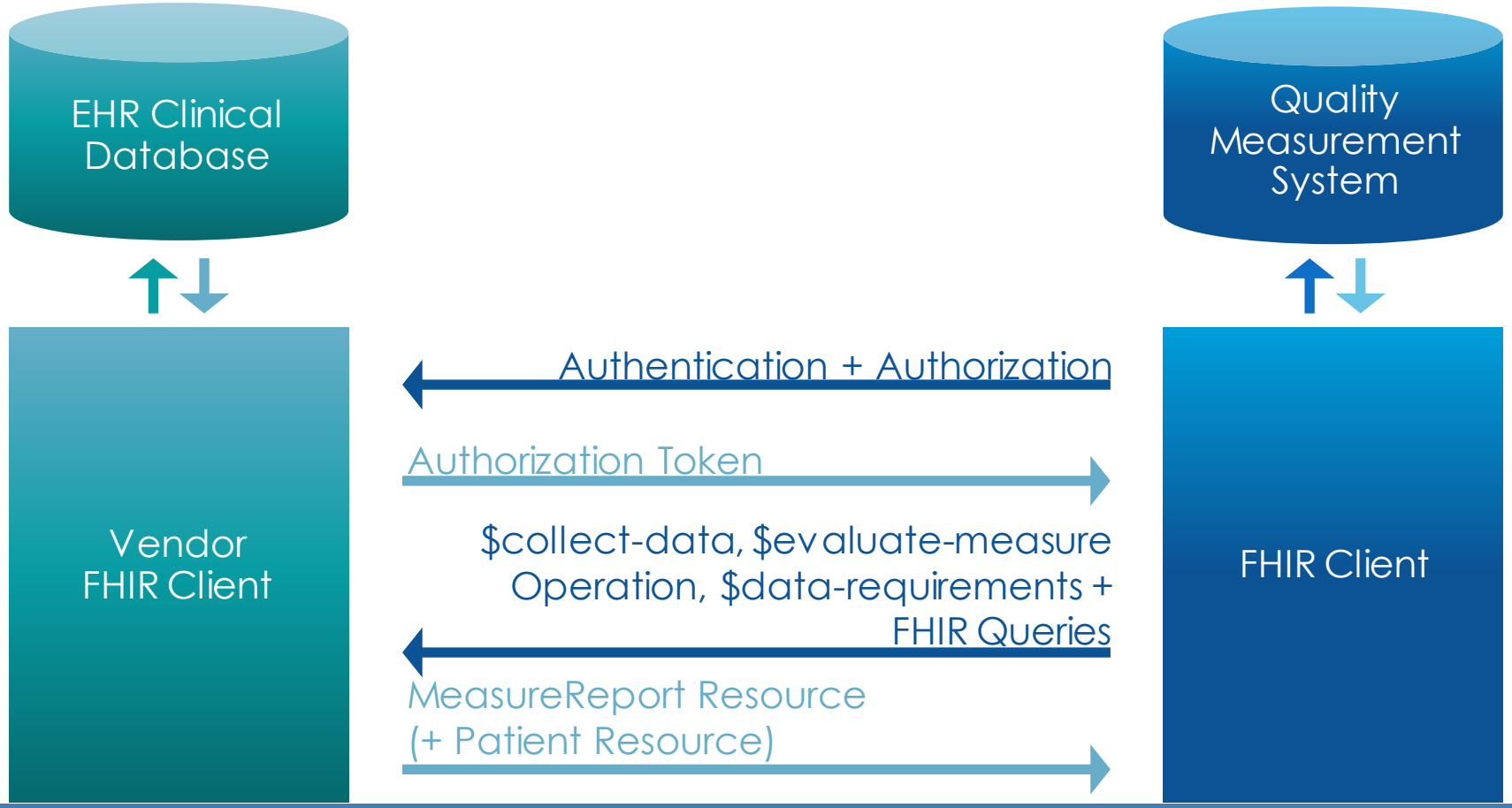
FHIR for Quality

DEQM – Pull



Implements DEQM IG + OAuth 2

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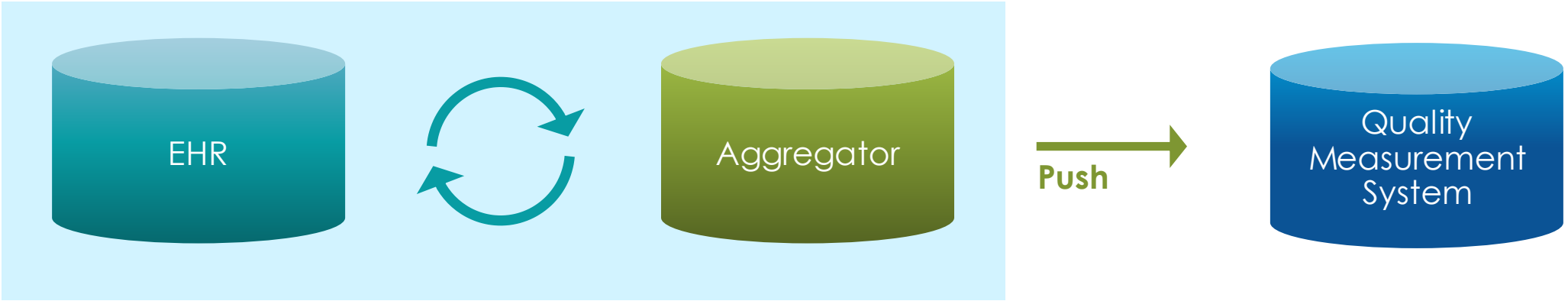
FHIR for Quality

Burden Reduction - Scenario



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Current FHIR Pilot and Outcomes

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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

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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

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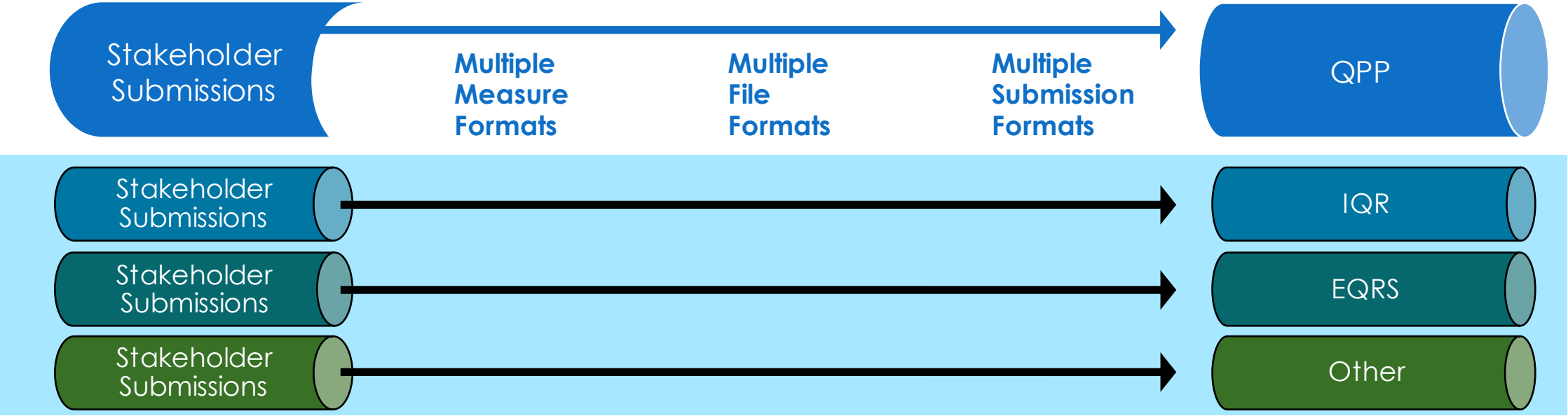
Current FHIR Pilot and Outcomes

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.



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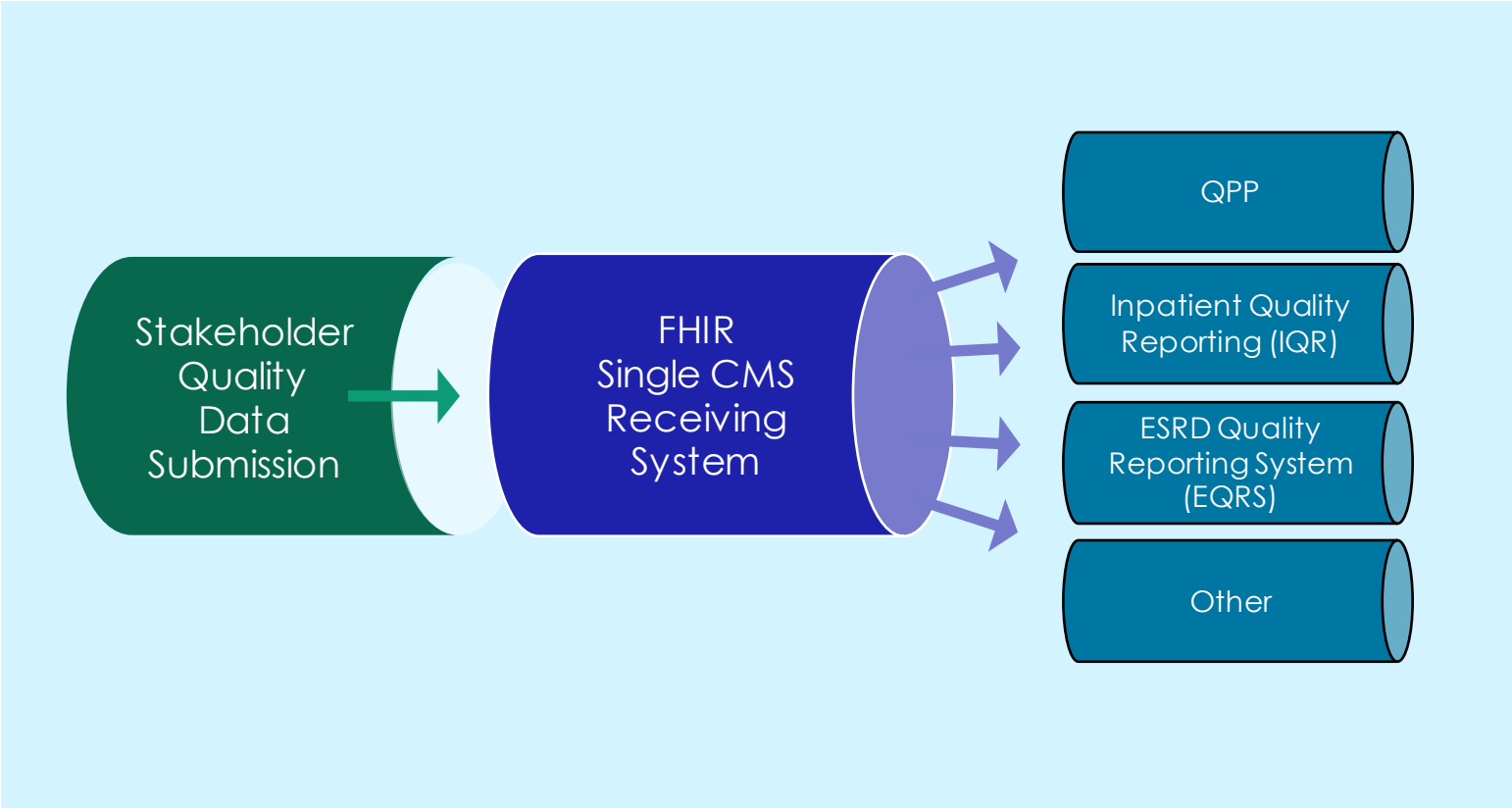
FHIR Pilot for CCSQ: Future State Submissions to CMS

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.



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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

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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

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Readiness Discussion

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Readiness Discussion

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

Mentimeter

0	0	0	0	0
DSTU 2/Argonaut	STU3/US-Core 2	R4/ US-Core 3	Not using FHIR	Unknown

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Readiness Discussion

My practice/organization will upgrade to FHIR R4

Mentimeter

0	0	0	0	0
No current plan	Within the next year	Depends on my vendor (s)	Depends on regulation	Unknown

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Readiness Discussion

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

Mentimeter

0	0	0	0	0
CMS vendor listserv	CMS program-specific listserv	HL7	Da Vinci listserv	Other

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Readiness Discussion

Mentimeter

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.

True	False
0	0

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Readiness Discussion

Mentimeter

What additional education topics would you like us to provide?

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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