Digital Quality Measurement Strategic Roadmap:
Executive Summary

March 2022

CMS has set the critical goal of **transitioning to digital quality measurement**

CMS has set a new course for quality measurement aimed at contributing to a learning health system (LHS) to optimize patient safety, outcomes, and experience

Enable a future in which **care quality is entirely measured digitally**, using standardized, interoperable data

Reduce the burden of electronic health record (EHR) data mapping and reporting workflows by leveraging **Fast Healthcare Interoperability Resources (FHIR®) application programming interface (API) technology that is already required for interoperability**

Provide usable, timely data from multiple sources to support delivery of high quality of care and quality improvement

Produce reliable and valid measurement results common across multiple programs and payers

To achieve this vision, CMS needs a coordinated strategy that builds on recent and current activities

- Recent CMS and ONC rules require provider and health plan FHIR® APIs to **make data more accessible for interoperability**

- Meaningful Measures 2.0 identifies **priority areas and focuses on digital quality measures**

- ONC continues to expand the United States Core Data for Interoperability (USCDI) and launched USCDI+ initiatives

- Health Level Seven (HL7®) FHIR Accelerator multi-stakeholder private and public-private groups are advancing FHIR standards for use cases

ONC Rule
Certified EHR technology (CEHRT) requires FHIR-based APIs supporting exchange of all **USCDI version 1 data elements** according to the US Core Implementation Guide by December 31, 2022

CMS Rule
Regulated health plans must implement FHIR-based APIs
- For patient access of claims, encounter, and USCDI data by July 2021
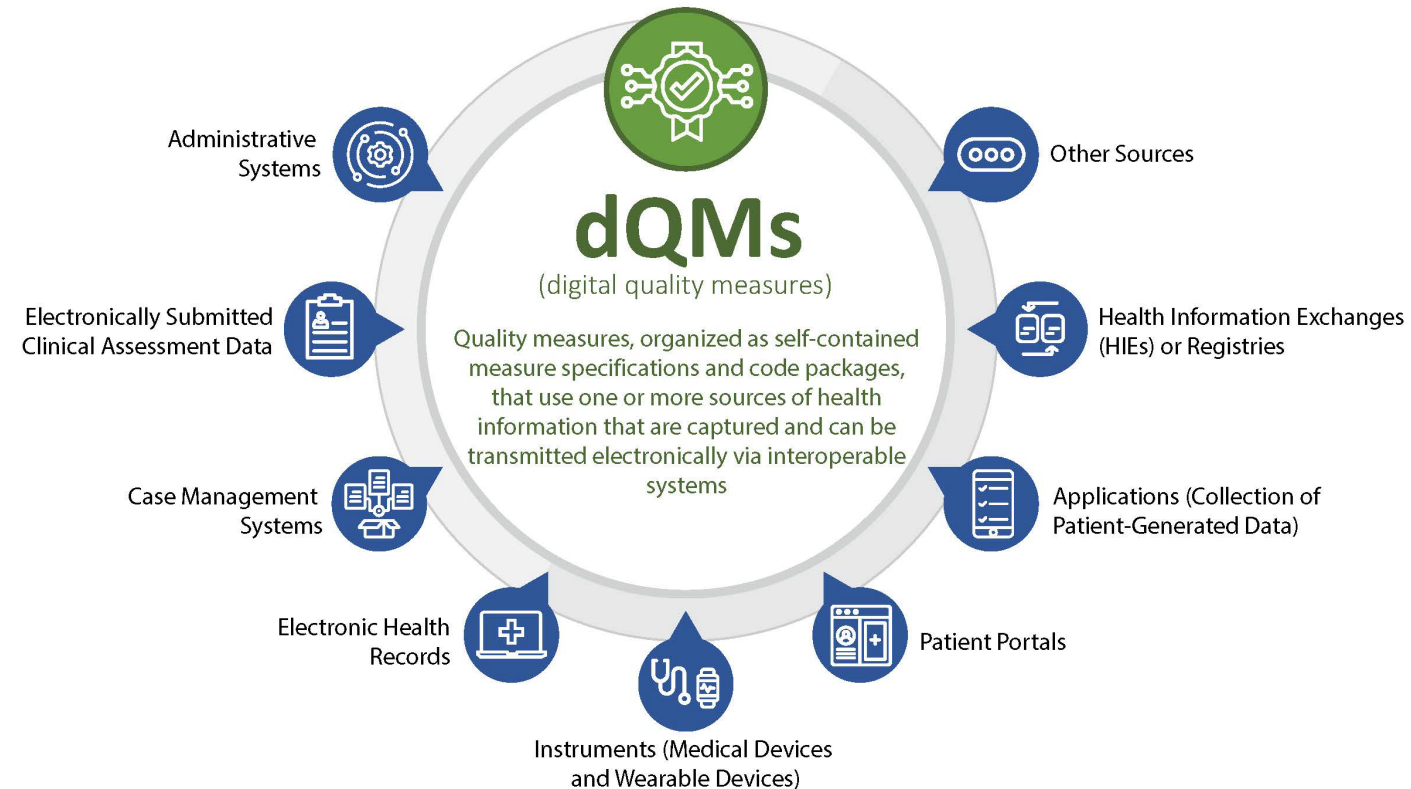- To transfer USCDI data among payers by January 2022

Sources:
https://www.cms.gov/meaningful-measures-20-moving-measure-reduction-modernization
https://www.federalregister.gov/documents/2020/05/01/2020-07419/21st-century-cures-act-interoperability-information-blocking-and-the-onc-health-it-certification
https://www.federalregister.gov/documents/2020/05/01/2020-05050/medicare-and-medicaid-programs-patient-protection-and-affordable-care-act-interoperability-and

Digital quality measures (dQMs) defined

- dQMs are quality measures, organized as self-contained measure specifications and code packages, that use one or more sources of health information that are captured and can be transmitted electronically via interoperable systems

- Potential data sources for dQMs include EHR data, patient-generated health data, and registry data, among others

- dQMs will leverage advances in technology (for example, FHIR® APIs) to access and electronically transmit interoperable data for measure calculation and reporting
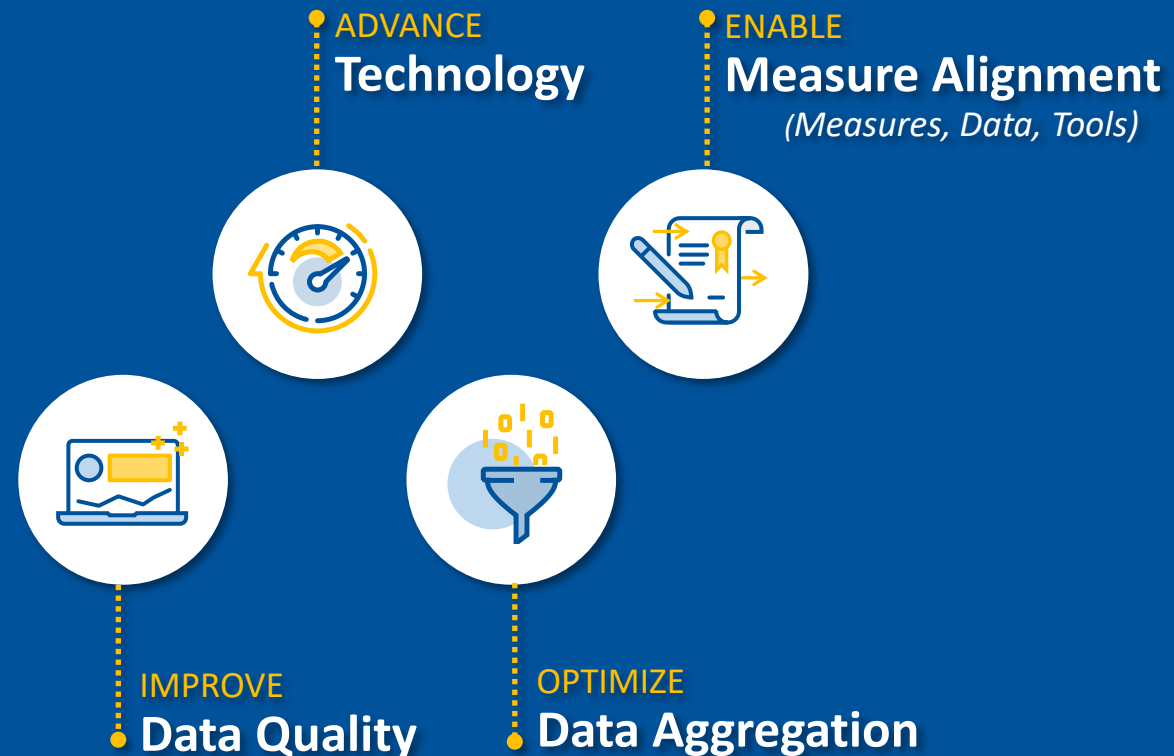
dQMs (digital quality measures)

Quality measures, organized as self-contained measure specifications and code packages, that use one or more sources of health information that are captured and can be transmitted electronically via interoperable systems

- Administrative Systems
- Other Sources
- Electronically Submitted Clinical Assessment Data
- Health Information Exchanges (HIEs) or Registries
- Case Management Systems
- Applications (Collection of Patient-Generated Data)
- Electronic Health Records
- Patient Portals
- Instruments (Medical Devices and Wearable Devices)

CMS developed a **Strategic Roadmap for advancing digital quality measurement** centered around **four key domains**

Advancing Digital Quality Measurement
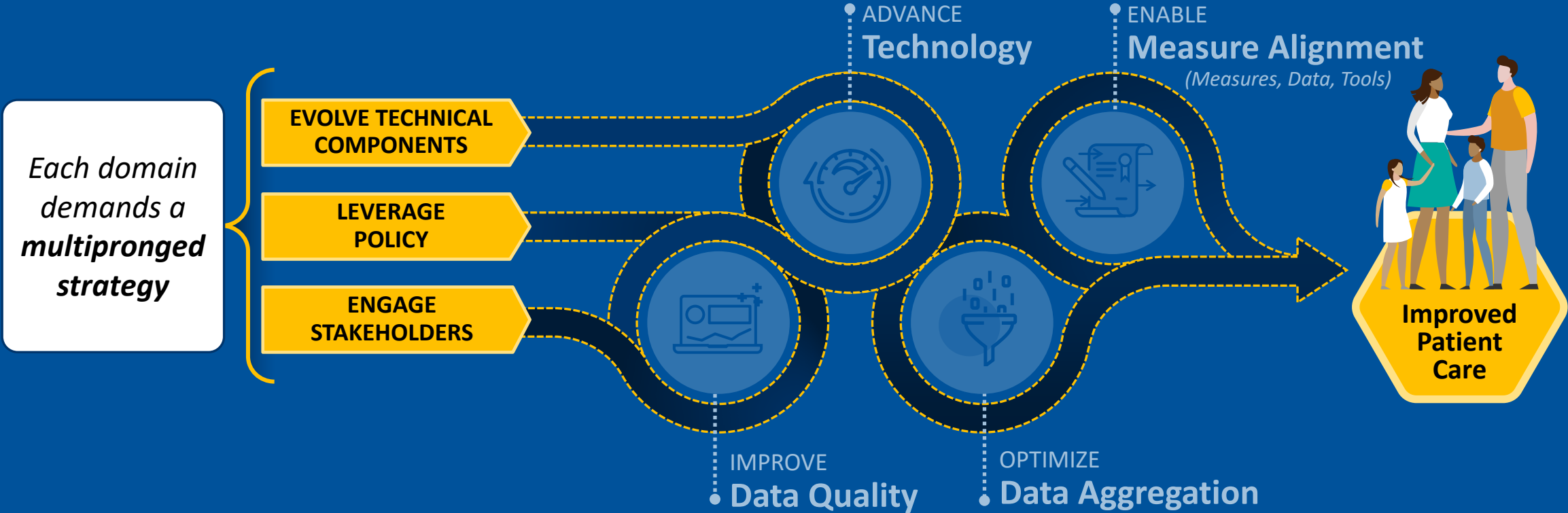
Strategic Roadmap

*The **Strategic Roadmap** focuses on four domains*

ADVANCE
Technology

ENABLE
Measure Alignment
(Measures, Data, Tools)

IMPROVE
Data Quality

OPTIMIZE
Data Aggregation

A **multipronged strategy** across the four domains supports improving quality measurement and patient care

Advancing Digital Quality Measurement

Strategic Roadmap

Each domain demands a **multipronged strategy**

EVOLVE TECHNICAL COMPONENTS

LEVERAGE POLICY

ENGAGE STAKEHOLDERS

ADVANCE
Technology

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Data Aggregation

Improved Patient Care

The Strategic Roadmap outlines the **current state**, **future state goals**, and provides **recommended actions** for success

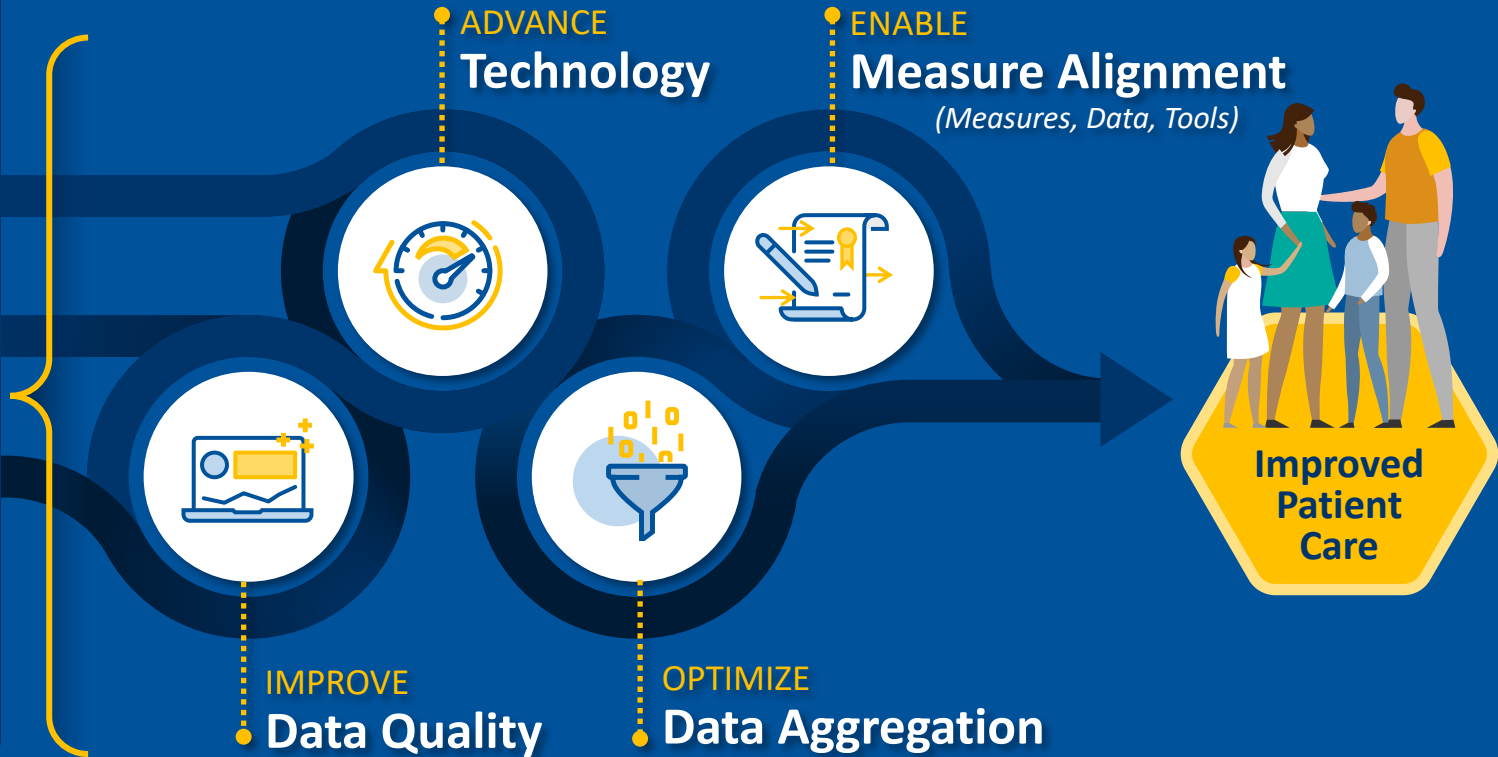## Advancing Digital Quality Measurement

Strategic Roadmap

For each domain, this presentation introduces:

CURRENT → FUTURE

- Description of current state
- Goals of future state

- Recommended actions for success

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An efficient and streamlined digital measurement ecosystem can contribute to a **learning health system** that uses data to drive health care

LEGEND:
Sponsoring HL7 Workgroups

- Clinical Decision Support (CDS)
- Clinical Quality Information (CQI)
- Public Health (PH)

Adapted from HL7 Clinical Quality Information (CQI) Workgroup by Maria Michaels, Centers for Disease Control and Prevention
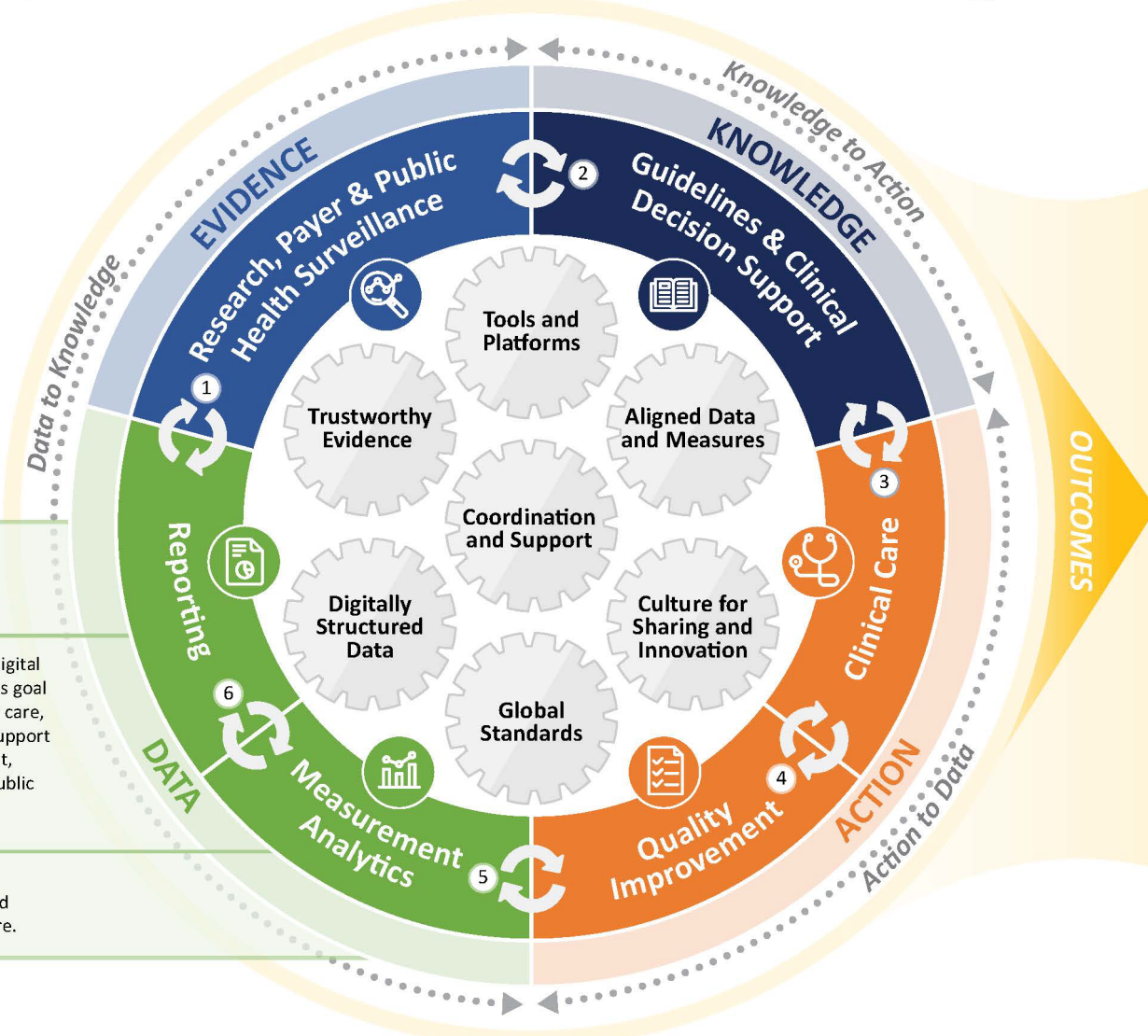
Digital Quality Measurement

Reporting
Quality measurement reporting via digital quality measurement advances CMS's goal of supporting delivery of high quality care, using the same data elements that support interoperability, quality improvement, clinical decision support, research, public health, etc.

Measurement Analytics
Digital data is also used for quality improvement activities, analytics, and measurement to improve patient care.

EVIDENCE — Research, Payer & Public Health Surveillance

KNOWLEDGE — Guidelines & Clinical Decision Support

Clinical Care

ACTION — Quality Improvement

DATA — Measurement Analytics

Reporting

Data to Knowledge

Knowledge to Action

Action to Data

OUTCOMES

Tools and Platforms

Aligned Data and Measures

Trustworthy Evidence

Coordination and Support

Culture for Sharing and Innovation

Digitally Structured Data

Global Standards

High Quality Care for Patients

- Rapid-Cycle Feedback and Continuous Improvement
- Usable and Timely Data from Multiple Sources
- Reliable and Valid Measurement

The Strategic Roadmap addresses how an efficient digital measurement ecosystem would improve all phases of the **healthcare data lifecycle**

PATIENT ENCOUNTER

ENHANCED INSIGHTS

Better Access to Data →

← Improved Patient Care

Healthcare Data Lifecycle

1 Capture → **2** Standardize → **3** Share → **4** Analyze → **5** Interpret and Apply

Digital Measurement Ecosystem Needs the Ability to

Capture
- Capture **all data required for dQMs** in the EHR, patient portals, or other digital platforms
- Account for differences in EHR set-ups
- Align with a comprehensive set of data elements necessary for current or future dQMs

Standardize
- **Employ a standardized data model optimized for interoperability**
- **Enable system-wide queries within and across providers** by transforming data from multiple EHRs' different data models into a single, interoperable view

Share
- **Make data accessible** by exposing it through an API that shares a common core set of capabilities and authentication frameworks across data sources
- Ensure accessibility and usability without need for special capabilities for each use case

Analyze
Perform complex calculation and reporting functions:
- **Map quality measurement concepts** to the standard data model for interoperability
- **Translate measurement specifications** into basic API calls for required data elements
- **Aggregate** data elements from multiple sources

Interpret and Apply
- Support **multiple uses** of the data, not just quality measurement
- Implement a **low-burden measurement** approach
- Facilitate **rapid-cycle feedback** and learning

CMS intends to leverage FHIR® for digital quality measurement

- **Reduces burden**
  - Aligns CMS eCQM reporting with industry clinical data exchange framework and clinical decision support (CDS)
  - Data exposed in a consistent format enables automated data retrieval from EHRs and submission of data for quality measurement through use of standards-based APIs
  - Enables the provision of near real-time feedback on quality measurement results to providers

- **Simplifies data mapping**
  - Single mapping to FHIR vs. mapping to Health Quality Measurement Format (HQMF) and Quality Reporting Document Architecture (QRDA)

- **Promotes interoperability**
  - Aligns data exchange requirements for quality measurement and reporting with interoperability standards used in other healthcare exchange methods
  - Flexibility of the model allows for better access to and exchange of information

CMS anticipates FHIR® will be the **dominant standard** used across the industry for many years to come

- FHIR allows the access and use of data elements for a variety of contexts – for example:
  - Patient engagement
  - Population health management programs
  - Facilitation of intelligent clinical decision support

- The commercial community and big tech have embraced FHIR and are building on the same base data model
  - Google has built on it with Google Remote Procedure Call (gRPC)
  - Amazon HealthLake organizes and indexes data in the FHIR standard to help break down data siloes

CMS can leverage structured, standardized data to reduce collection and reporting burden

CURRENT STATE → FUTURE STATE

Providers struggle to implement current eCQMs

- Slow adoption and limitations of current standards
- Lack of provider data mapping and quality assurance (QA) of required data
- Requires changes to clinical workflows

dQM implementation is seamless and automated

- Focus on **standardized data**– FHIR®, USCDI, and supplemental standards (i.e., USCDI+) that enable automated extraction of EHR data
- Standardized and automated data collection facilitates **valid and reliable data mapping** and streamlined auditing processes
- Elimination of workflow changes required only for measurement and focus on measures that also **align with quality improvement priorities**
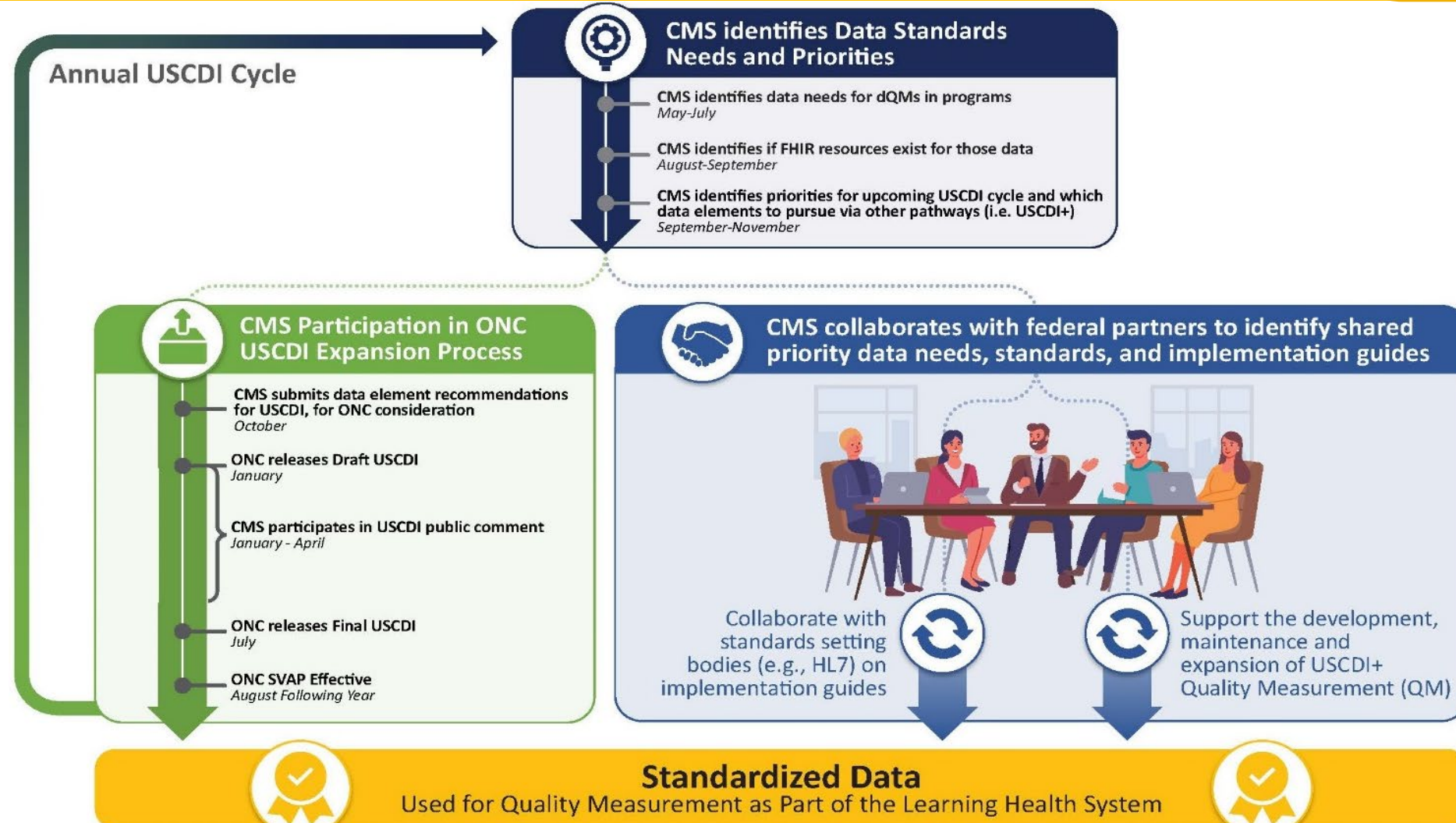
1 Capture > 2 Standardize > 3 Share > 4 Analyze > 5 Interpret and Apply

CMS is contributing to the **advancement of data standards** through several pathways

Annual USCDI Cycle

CMS identifies Data Standards Needs and Priorities

- CMS identifies data needs for dQMs in programs
  May-July
- CMS identifies if FHIR resources exist for those data
  August-September
- CMS identifies priorities for upcoming USCDI cycle and which data elements to pursue via other pathways (i.e. USCDI+)
  September-November

CMS Participation in ONC USCDI Expansion Process

- CMS submits data element recommendations for USCDI, for ONC consideration
  October
- ONC releases Draft USCDI
  January
- CMS participates in USCDI public comment
  January - April
- ONC releases Final USCDI
  July
- ONC SVAP Effective
  August Following Year

CMS collaborates with federal partners to identify shared priority data needs, standards, and implementation guides

Collaborate with standards setting bodies (e.g., HL7) on implementation guides

Support the development, maintenance and expansion of USCDI+ Quality Measurement (QM)

Standardized Data
Used for Quality Measurement as Part of the Learning Health System

1 Capture   2 Standardize   3 Share   4 Analyze   5 Interpret and Apply

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USCDI version 1 data classes and elements

ALLERGIES AND INTOLERANCES

- Substance (Medication)
- Substance (Drug Class)
- Reaction

ASSESSMENT AND PLAN OF TREATMENT

- Assessment and Plan of Treatment

CARE TEAM MEMBERS

- Care Team Members

CLINICAL NOTES

- Consultation Note
- Discharge Summary Note
- History & Physical
- Imaging Narrative
- Laboratory Report Narrative
- Pathology Report Narrative
- Procedure Note
- Progress Note

GOALS

- Patient Goals

HEALTH CONCERNS

- Health Concerns

IMMUNIZATIONS

- Immunizations

LABORATORY

- Tests
- Values/Results

MEDICATIONS

- Medications

PROBLEMS

- Problems

PROCEDURES

- Procedures

PATIENT DEMOGRAPHICS

- First Name
- Last Name
- Previous Name
- Middle Name (incl Middle Initial)
- Suffix
- Birth Sex
- Date of Birth
- Race
- Ethnicity
- Preferred Language
- Current Address
- Previous Address
- Phone Number
- Phone Number Type
- Email Address

SMOKING STATUS

- Smoking Status

PROVENANCE

- Author Time Stamp
- Author Organization

VITAL SIGNS

- Diastolic Blood Pressure
- Systolic Blood Pressure
- Body Height
- Body Weight
- Heart Rate
- Respiratory Rate
- Body Temperature
- Pulse Oximetry
- Inhaled Oxygen Concentration
- BMI Percentile (2 - 20 Years)
- Weight-for-length Percentile (Birth - 36 Months)
- Head Occipital-frontal Circumference Percentile (Birth - 36 Months)

UNIQUE DEVICE IDENTIFIER(S) FOR A PATIENT'S IMPLANTABLE DEVICE(S)

- Unique Device Identifier(s) for a Patient's Implantable Device(s)

Source:
https://www.healthit.gov/isa/sites/isa/files/inline-files/USCDI-v1-2019.pdf

1 Capture 2 Standardize 3 Share 4 Analyze 5 Interpret and Apply

Data strategy: Focus on USCDI, USCDI+ and structured, standards-based data for measurement

- Advance the data standardization, transmissibility, and use of currently captured digital data

  - **Reduce hospital burden** by using data already available for other use cases (interoperability, quality improvement) for quality measurement with limited additional workflow requirements as FHIR®-ready models are adopted

    - Leverage FHIR, USCDI, and ONC certification requirements for the basis of EHR-based measurement
    - Contribute to USCDI+ Quality Measurement use case to **develop supplemental requirements** to support measurement

- Continue to collaborate with federal agencies, standard-setting bodies, and other stakeholders to align data standards for dQMs with other uses

  - Consider how **implementation guides** for different use cases (for example, public health reporting, clinical decision support, quality measurement) work together to support a learning health system

1 Capture 2 Standardize 3 Share 4 Analyze 5 Interpret and Apply

Data strategy: advance additional data standards for critical data and enhance data validity

- Accelerate digital capture and standardization of new data critical to advance quality measurement
  - **Contribute to the expansion of standards** for data captured beyond the clinical EHR and Medicare claims, including patient-reported outcomes and social determinants of health (SDOH) data
    - These digital data are often captured outside of the EHR, and will require innovation in the use of technology to capture these data and collaboration in standards advancement to represent the data

- Advance tools and processes to validate data used in measurement
  - Mapping data to nationally supported standards is an important initial step, however additional **validation and auditing is necessary** to ensure accountability for accuracy and adherence to standards and requirements
  - Build on existing CMS and other agency audit systems to **deploy advanced tools and methods** for validation of data quality and completeness
    - New technological and analytical advancements such as natural language processing (NLP) and artificial intelligence (AI) can and should be leveraged

1 Capture 2 Standardize 3 Share 4 Analyze 5 Interpret and Apply

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Summary: Key actions

Advanced Digital Quality Measurement

Strategic Roadmap

ADVANCE
Technology

EVOLVE TECHNICAL COMPONENTS

LEVERAGE POLICY

STAKEHOLDER ENGAGEMENT

ENABLE
Measure Alignment

IMPROVE
Data Quality

OPTIMIZE
Data Aggregation

Improved Patient Care

CMS can **leverage FHIR® APIs** to implement a low-burden measurement approach that facilitates learning

CURRENT STATE

- Data sharing often supports sharing of whole patient record not individual data elements

- Electronic data extraction for eCQMs is burdensome or impossible due to differences in EHR set-ups and requirement to map to the Quality Data Model

- Hospitals' and other providers' work to implement measures has no collateral benefit

FUTURE STATE

- Measures are defined in FHIR, a versatile model used across multiple applications that **supports access to "atomic" data**

- FHIR-based measure applications are components of a **service-oriented** architecture

- Quality measures are open-core, self-contained tools – **Measure Calculation Tools** – that query data from **FHIR APIs** mandated for interoperability

- Work done to implement measures **advances quality improvement and research**, and **measures are developed as modules** within the larger healthcare ecosystem

1 Capture   2 Standardize   3 Share   4 Analyze   5 Interpret and Apply

Many providers already have to implement FHIR® APIs that **expose standardized data** for interoperability

Healthcare Data Lifecycle

IMPROVED PATIENT CARE → / ← BETTER ACCESS TO DATA

1 Capture **2** Standardize **3** Share **4** Analyze **5** Interpret and Apply

PROVIDER FIREWALL

Provider FHIR Server

API Endpoints

A
B
C
D
E
F
G

Transforms and maps to FHIR data model

PROVIDER EHR Non-FHIR System

USCDI Content *Stored at FHIR API Endpoints*

All USCDI Content
US Core Implementation Guide capability

CMS — CENTERS FOR MEDICARE & MEDICAID SERVICES

The Office of the National Coordinator for Health Information Technology

ONC/CMS Interoperability Requires EHRs to:

- Accommodate user requests for data, search for data, and return required data elements as needed

  Users could include:
  - ✓ Other providers
  - ✓ Patients
  - ✓ Payers, including CMS
  - ✓ Researchers

- Be accessible and usable without requiring special capabilities, using **simple queries naïve to the use case**

A purpose-built **Measure Calculation Tool** can access EHR data via the FHIR® API for quality measurement

Healthcare Data Lifecycle

← IMPROVED PATIENT CARE

BETTER ACCESS TO DATA →

| 1 Capture | 2 Standardize | 3 Share | 4 Analyze | 5 Interpret and Apply |

PROVIDER FIREWALL

Provider FHIR Server

API Endpoints

Map the interoperable data shared by the EHR to specific reporting criteria in measure requests:

- **Read and translate measure specifications** to reveal measurement criteria

- **Map criterion to required FHIR API endpoints** resting in provider EHR

- A single report may require mapping measure criteria across **multiple provider EHR FHIR APIs**

A
B
C
D
E
F
G

MEASURE CALCULATIONS

Measure Calculation Tool

DATA →

QM REQUEST

REPORTS →

22
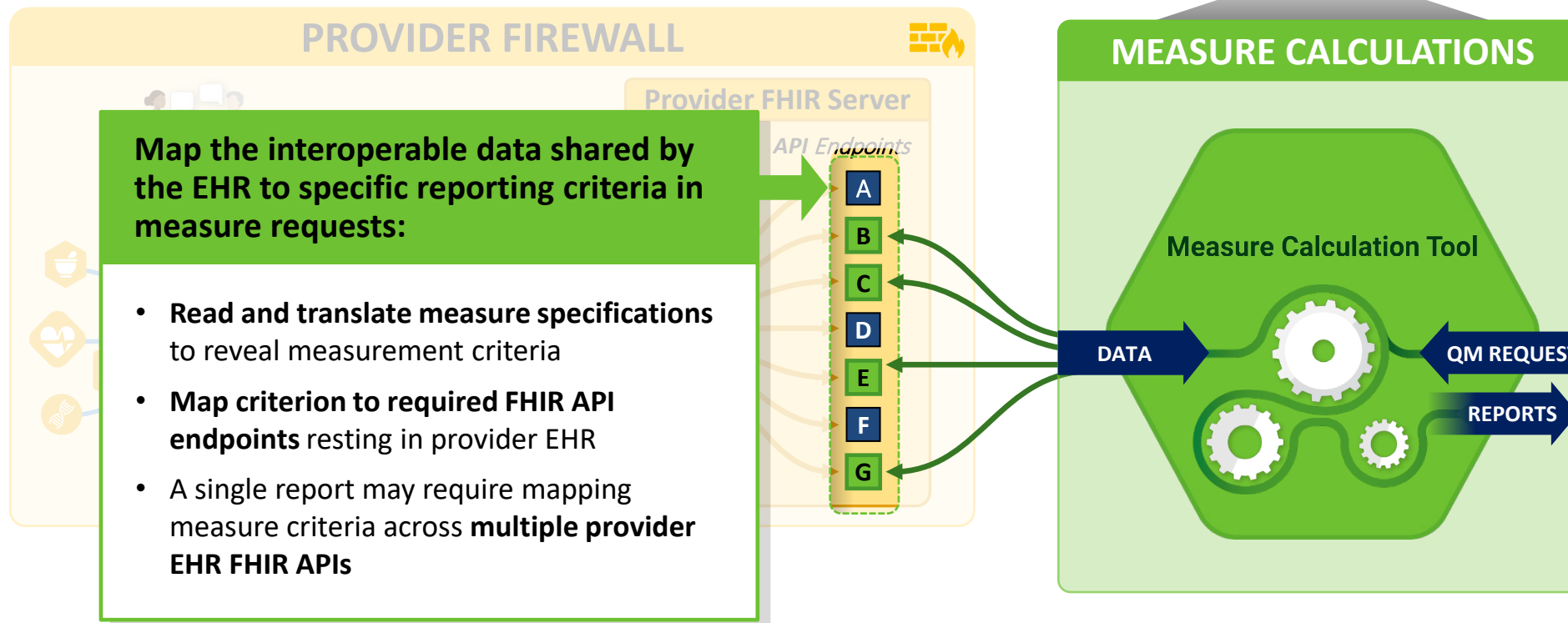
The Measure Calculation Tool is a tool for the digital ecosystem that could be **implemented in many ways**

Healthcare Data Lifecycle

← IMPROVED PATIENT CARE

BETTER ACCESS TO DATA →

| 1 Capture | 2 Standardize | 3 Share | 4 Analyze | 5 Interpret and Apply |

Isolating the burdensome, complex functions required to extract data from provider EHRs and produce reports in response to measure requests in separate Measure Calculation Tools will benefit the entire digital health ecosystem.

Consider three solutions the tool enables:

TECHNOLOGY SOLUTION A — **Provider EHRs Host the Measure Calculation Tools**

TECHNOLOGY SOLUTION B — **Third Party (e.g., HIEO) Runs Separate, EHR-Agnostic Measure Calculation Tools**

TECHNOLOGY SOLUTION C — **CMS Houses Measure Calculation Tools**

MEASURE CALCULATIONS

Measure Calculation Tool

DATA → → QM REQUEST

REPORTS →
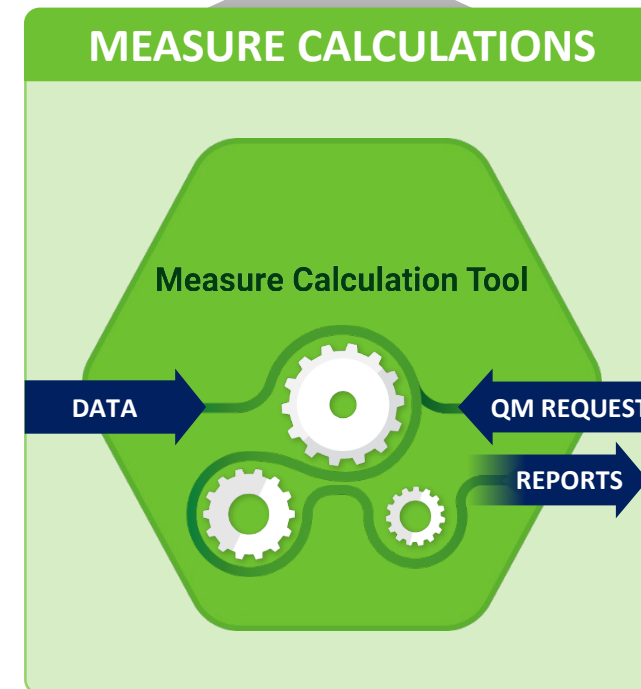
Provider can build, maintain, and/or host the Measure Calculation Tools in their EHRs

TECHNOLOGY SOLUTION **A**

ADVANCE **Technology**

IMPROVED PATIENT CARE

BETTER ACCESS TO DATA

Healthcare Data Lifecycle

1 Capture
2 Standardize
3 Share
4 Analyze
5 Interpret and Apply

Thousands of Provider EHRs, Each With Their Own Measure Calculation Tools

Limited Data Clients
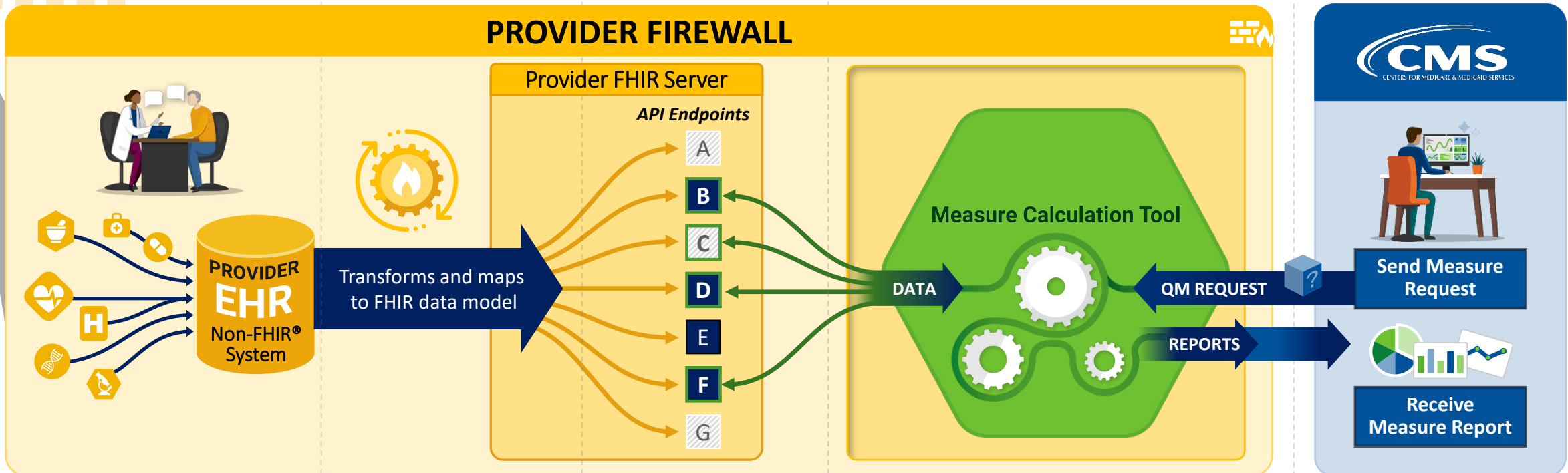
PROVIDER FIREWALL

Provider FHIR Server

API Endpoints
A B C D E F G

PROVIDER EHR Non-FHIR® System

Transforms and maps to FHIR data model

Measure Calculation Tool

DATA

QM REQUEST

REPORTS

CMS
CENTERS FOR MEDICARE & MEDICAID SERVICES

Send Measure Request

Receive Measure Report

Provider captures non-standard data at patient encounter:

- Data model is EHR-specific and usually proprietary to EHR system

Provider implements FHIR API that transforms data into a standardized data view and likely supports additional capabilities to interact with internal measure tool

Tool accesses data "on-site," or reads measure request and maps measure criteria to data elements resting at provider API endpoints:

- May require connecting to multiple EHR FHIR APIs
- Provider installs tool and evolves to commercially hardened version

CMS receives and uses reports for quality measurement and improvement

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Third party such as HIEO, quality measurement contractor, or aggregator/calculator can run separate, EHR-agnostic Measure Calculation Tools

IMPROVED PATIENT CARE

BETTER ACCESS TO DATA

Healthcare Data Lifecycle

1 Capture **2** Standardize **3** Share **4** Analyze **5** Interpret and Apply

Measure Calculation Tool May Need to Map to Multiple FHIR Servers Per Measure Request

Third Parties Run Measure Calculation Tools for Measures and Measure Sets

Many Data Clients
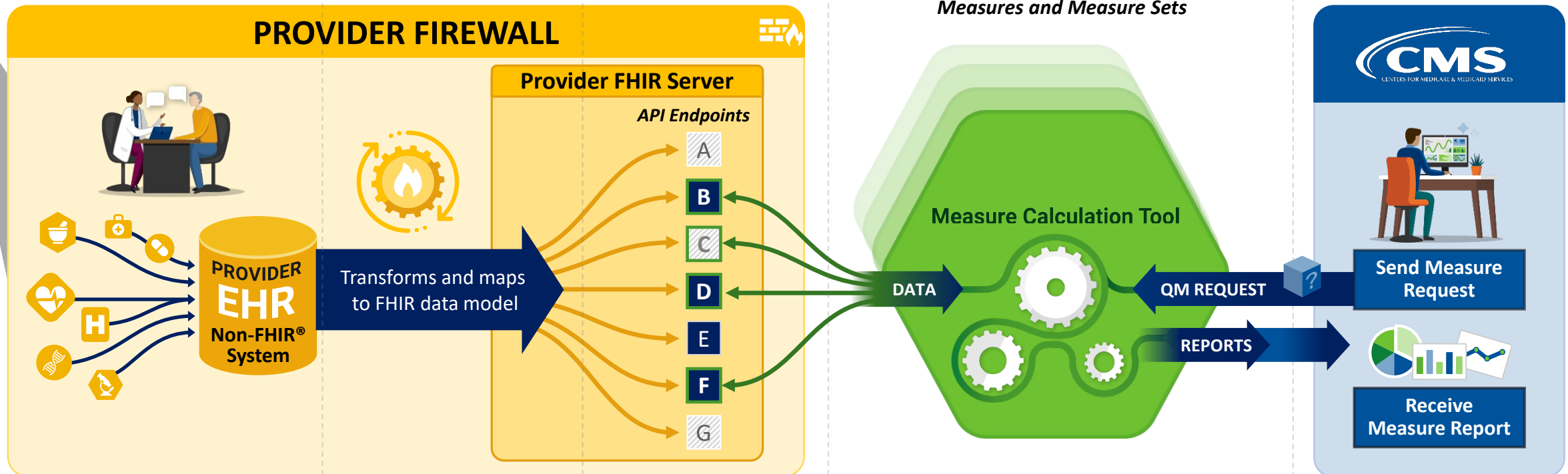
PROVIDER FIREWALL

Provider FHIR Server

API Endpoints

A B C D E F G

Transforms and maps to FHIR data model

PROVIDER EHR Non-FHIR® System

Measure Calculation Tool

DATA QM REQUEST REPORTS

CMS CENTERS FOR MEDICARE & MEDICAID SERVICES

Send Measure Request

Receive Measure Report

Provider captures non-standard data at patient encounter:
- Data model is EHR-specific and usually proprietary to EHR system

Provider implements FHIR API that transforms data into a standardized data view

Provider stores passive, interoperable data: Waits for a request from a Measure Calculation Tool or other application/ user

Tool reads measure request and maps measure criteria to data elements resting at provider API endpoints
- May require connecting to multiple EHR FHIR APIs

All approved data clients can receive and use reports for **quality measurement and improvement, clinical decision support,** and **research**

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← IMPROVED PATIENT CARE

BETTER ACCESS TO DATA →

Healthcare Data Lifecycle

1 Capture | **2** Standardize | **3** Share | **4** Analyze | **5** Interpret and Apply

CMS Houses and Runs Measure Calculation Tools

CMS Only

PROVIDER FIREWALL

CMS

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Transforms and maps to FHIR data model

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QualiFHIR
Measure Calculation Tool

DATA

QM REQUEST

REPORTS

Send Measure Request

Receive Measure Report
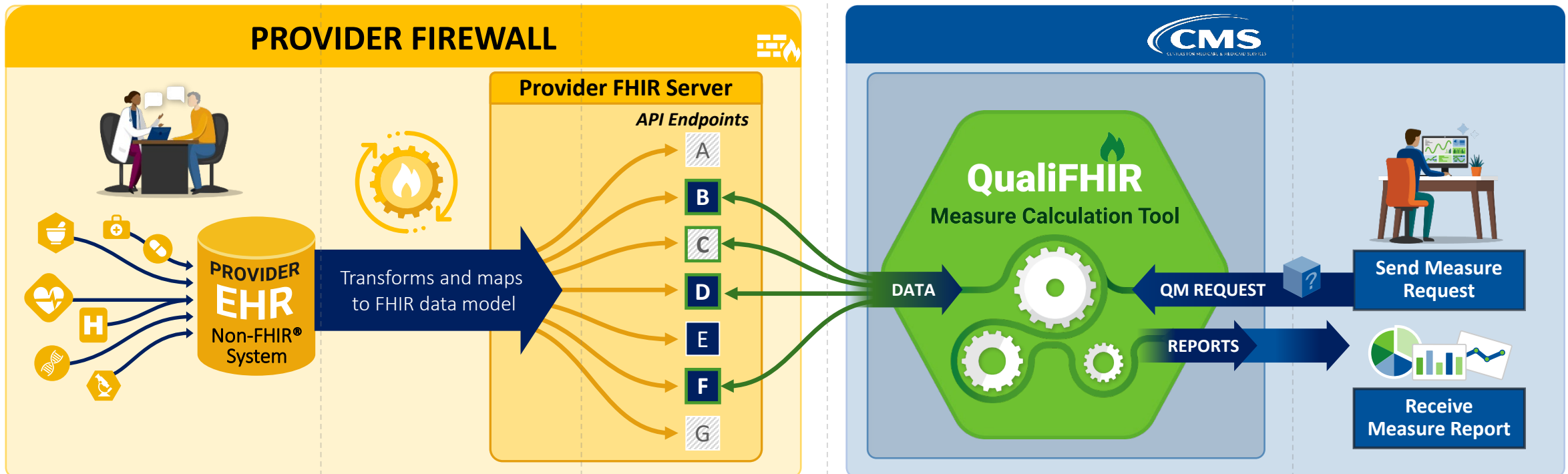
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Provider stores passive, interoperable data: Waits for a request from a Measure Calculation Tool or other application/ user

CMS houses tool (e.g., QualiFHIR). Tool reads measure request and maps measure criteria to data elements resting at provider API endpoints.
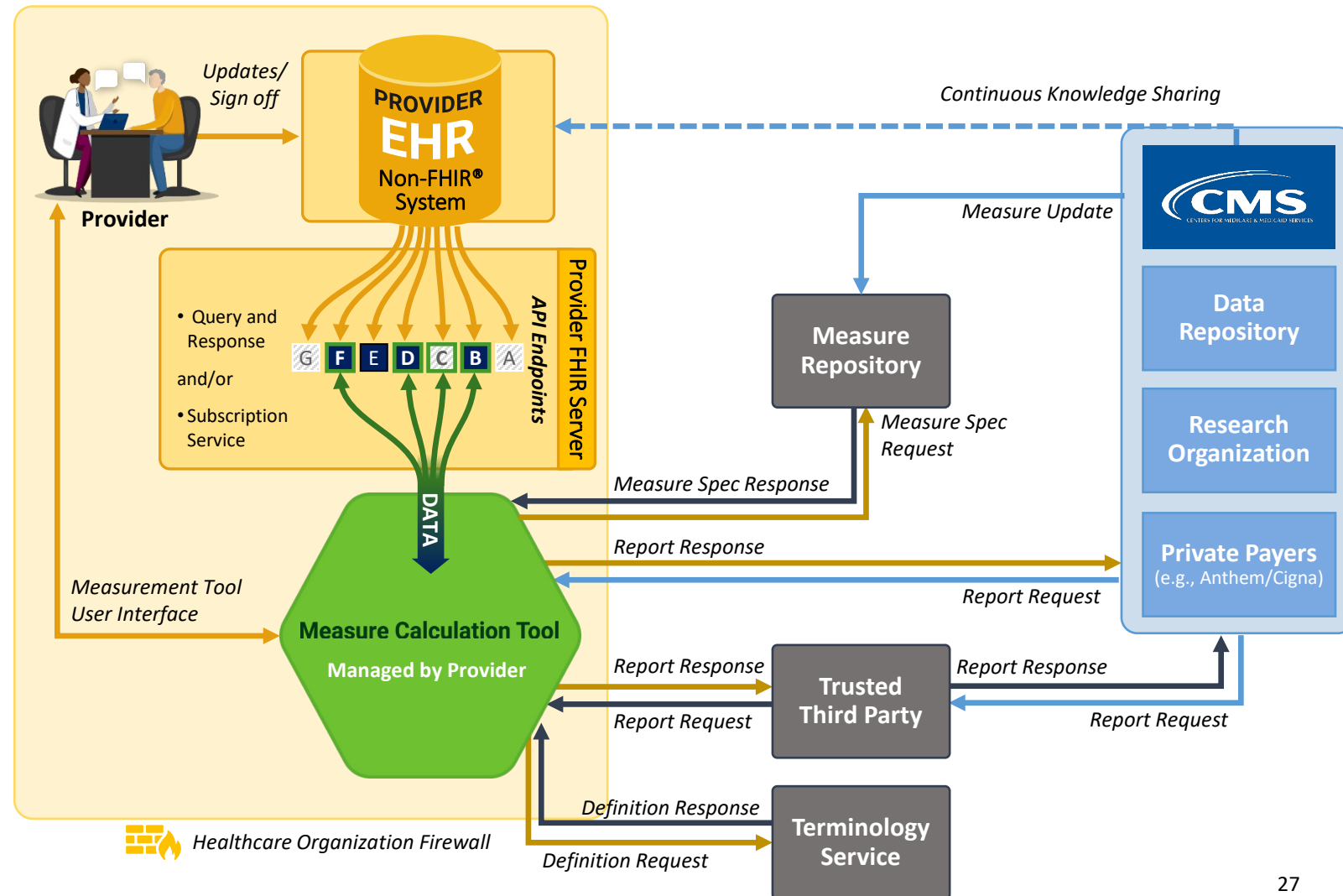
CMS generates and owns reports for **quality measurement and improvement only**

The aim of the Measure Calculation Tool technical architecture is to **minimize provider burden**

Aligns with other agencies' initiatives, like the Center for Disease Control's Making EHR Data More Available for Research and Public Health (MedMorph)

- EHR is data source through FHIR API

- Measure Calculation Tool is backend services application

- Measure repository, or knowledge artifact repository, contains measure specifications

- Trusted third party receives and forwards reports to receiving systems

- Receiving systems (e.g., CMS, private payers, research organizations) obtain reports generated by Measure Calculation Tool

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Summary: Key actions

ADVANCE
Technology

Advanced Digital Quality Measurement

Strategic Roadmap

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CMS can adapt and leverage current aggregation ecosystem to achieve **accessible and integrated data from multiple sources**

CURRENT STATE → FUTURE STATE

Data aggregation limited due to

- Lack of interoperability

- Lack of governance or authority

- Health Insurance Portability and Accountability Act restrictions

- Patient identification limitations

Aggregate patient-level data to

- Apply risk adjustment and attribution for accountability

- Integrate data from multiple sources for various uses (SDOH, patient-generated)

- Repurpose siloed data for broad use
  - Measurement and accountability
  - National surveillance
  - Cross-setting care coordination
  - Multi-site and multi-sector research
  - Systemic continuous quality improvement

1 Capture 2 Standardize 3 Share 4 Analyze 5 Interpret and Apply

Aggregation ecosystem for healthcare
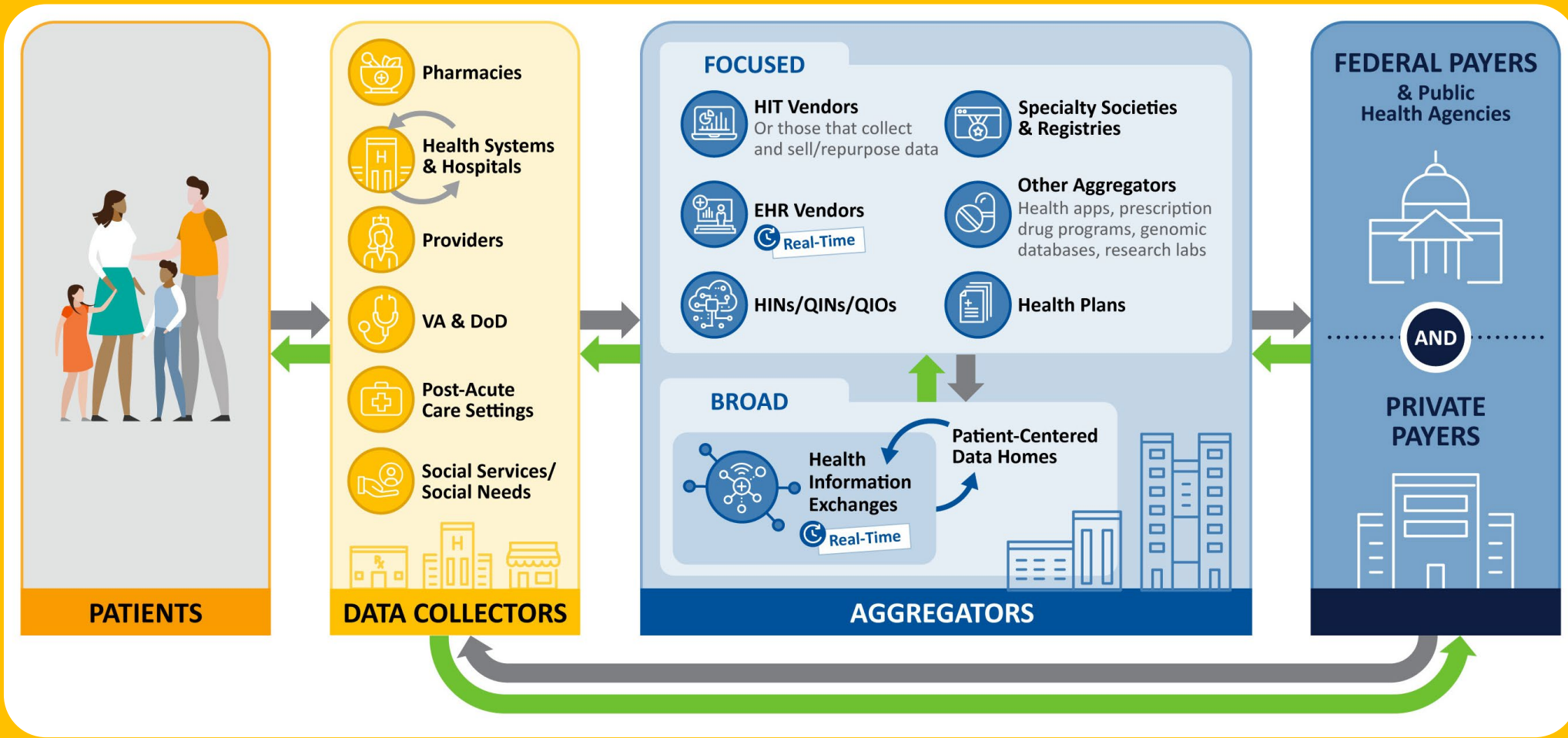
- **Data collectors:** The original source of data; Aggregate data for their own patients or clients, and across their own affiliated organizations; Often very limited in accessing information captured beyond their own "walls"
- **Focused data aggregators:** Collect and combine data from primary data collectors for a set of narrow or specific purposes, often related to client needs
- **Broad data aggregators:** Combine data from other data aggregators, across many data sources, and for multiple purposes

The role of data aggregators can be **optimized** to support digital quality measurement

- Data aggregation from multiple digital sources is critical for meaningful measurement; **data aggregators can support many activities:**

  - Provide tools and resources such as quality improvement tools, clinical decision support, and public health reporting
  - Collect, clean, validate, and process data
  - Resolve patient identities and deduplicate data
  - Decrease FHIR® API query load caused by a substantial increase in internet traffic necessary for measurement, and support measure calculation and reporting

- CMS will explore **additional guidance and requirements necessary** for data aggregators to be equipped to aggregate and report the data required for dQMs, to ensure that:

  - All Measure Calculation Tools are correctly supported and function as expected
  - Aggregators demonstrate validity of input files to the Measure Calculation Tools and the measure output

- **CMS will also continue to serve as an aggregator**, as data aggregation from disparate aggregators will be required for national accountability

  - CMS will modernize receiving systems to support streamlined systems that allow for a singular point of data receipt to be used for data aggregation and quality reporting requirements

1 Capture   2 Standardize   3 Share   4 Analyze   5 Interpret and Apply

Summary: Key actions

ADVANCING DIGITAL QUALITY MEASUREMENT
STRATEGIC ROADMAP

Stakeholders

- **CMS** Centers for Medicare & Medicaid Services
- **ONC** Office of the National Coordinator for Health Information Technology
- Standard-Setting Bodies
- Patients/Caregivers
- Data Aggregators
- Third-Party Actors
- Providers
- IT Developers
- Private Payers
- EHR Vendors
- Measure Developers
- Other Federal/State Agencies

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Beyond

DATA AGGREGATION
1 Capture 2 Standardize 3 Share 4 Analyze 5 Interpret and apply

- **CMS** Identify role for aggregators for dQM
- Participate in the dQM enterprise
- **CMS** Develop guidelines/processes for dQM data aggregation with input from third-party actors/data aggregators

STRATEGIC ROADMAP FOUNDATION

Engage Stakeholders — **CMS ONC** — Engage stakeholders throughout Strategic Roadmap development and rollout to advance the digital quality measurement and a learning health system

Interoperability Requirements — **ONC** — To meet certification requirements, ONC requires health IT developers (e.g., EHR vendors) to:
- Make available standardized data (USCDI v1) via FHIR APIs by December 31, 2022
- Make available all electronic health information in any computable format by August 2023

CMS CMS requires regulated health plans to:
- Implement FHIR-based API for patient access by July 1, 2021
- Transfer USCDI among payers by January 2022

1 Capture   2 Standardize   3 Share   4 Analyze   5 Interpret and Apply

Advanced Digital Quality Measurement

Strategic Roadmap

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IMPROVE
Data Quality

OPTIMIZE
Data Aggregation

Improved Patient Care

Progress on other three domains **facilitates alignment**

CURRENT STATE → FUTURE STATE

CURRENT STATE

- Measures are program-, payer-, and setting-specific
- There have been strides toward interoperability across federal agencies (for example, VA EHR Modernization)
- Providers must support many measures
- Each measure in each setting creates marginal burden for the measured provider
- All-payer measures that capture full provider performance have limited feasibility

FUTURE STATE

- A common dQM portfolio across CMS programs, federal/state agencies, and private payers is built and maintained
- Data resources, standards, measures, and tools are shared across agencies and the broader healthcare ecosystem to maximize return on dQMs and minimize marginal costs
- Reporting across payers is low burden
- Health system learning is coordinated and shared across agencies and payers

1 Capture 2 Standardize 3 Share 4 Analyze 5 Interpret and Apply

Key stakeholders

- **Both the federal government and the private sector play key roles in accessing standardized health data to improve care**
  - For example, private sector develops technologies and measures

- **Alignment opportunities**
  - Cross-agency
  - Federal/states
  - Federal/private sector

Stakeholders:
- Federal/State Agencies
- Consensus/Standard-Setting Bodies
- Patients/Caregivers
- Data Aggregators
- Third-Party Actors/Other FHIR® Users
- Providers
- Health IT Developers
- Private Payers
- EHR Vendors
- Measure Developers

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Targets for alignment in building common dQM portfolio: data, tools, measure specifications

- **Identify best opportunities to promote alignment across tools, data, and measurement**
  - Leverage HL7®/FHIR® processes to create tools
  - Build on ONC's recently proposed Federal Health IT Strategic Plan
  - Engage the payer-driven Core Quality Measures Collaborative

- **Collaborate with agencies and private sector to implement core set of dQMs**
  - Stage implementation

Example Targets for Alignment	Federal	Public/Private
FHIR Tools	• CMS builds FHIR tools for data extraction, reporting • Federal FHIR tools used across agencies	• HL7 FHIR Accelerator tools used across payers
Streamline Data Transfer	• Data shared across CMS uses • Data shared across multiple agencies' uses	• Data in common format across all payers
Align Measures across Payers	• Measures aligned across CMS programs • Measures aligned with VA/DoD	• Measures aligned across public/private payers

1 Capture → 2 Standardize → 3 Share → 4 Analyze → 5 Interpret and Apply

Summary: Key actions

ADVANCING DIGITAL QUALITY MEASUREMENT

STRATEGIC ROADMAP

Stakeholders
- CMS — Centers for Medicare & Medicaid Services
- ONC — Office of the National Coordinator for Health Information Technology
- Standard-Setting Bodies
- Patients/Caregivers
- Data Aggregators
- Third-Party Actors
- Providers
- IT Developers
- Private Payers
- EHR Vendors
- Measure Developers
- Other Federal/State Agencies

Timeline: Year 1 — Year 2 — Year 3 — Year 4 — Year 5 — Year 6 — Beyond

MEASURE ALIGNMENT
1 Capture   2 Standardize   3 Share   4 Analyze   5 Interpret and apply

CMS — Engage federal, state, and industry partners *Focus: data, tool, measure alignment* — Rapid-Cycle

Develop common dQM portfolio in consideration of data quality and interoperability

Implement accountability measure of interoperability — CMS

Use rapid-cycle feedback enabled by MCT to improve care — Rapid-Cycle

Public and private sector begin to implement common dQM portfolio, building on standardized data and interoperability requirements *(staged, as appropriate)*

STRATEGIC ROADMAP FOUNDATION

Engage Stakeholders — Engage stakeholders throughout Strategic Roadmap development and rollout to advance the digital quality measurement and a learning health system

Interoperability Requirements — ONC

To meet certification requirements, ONC requires health IT developers (e.g., EHR vendors) to:
- Make available standardized data (USCDI v1) via FHIR APIs by December 31, 2022
- Make available all electronic health information in any computable format by August 2023

CMS requires regulated health plans to:
- Implement FHIR-based API for patient access by July 1, 2021
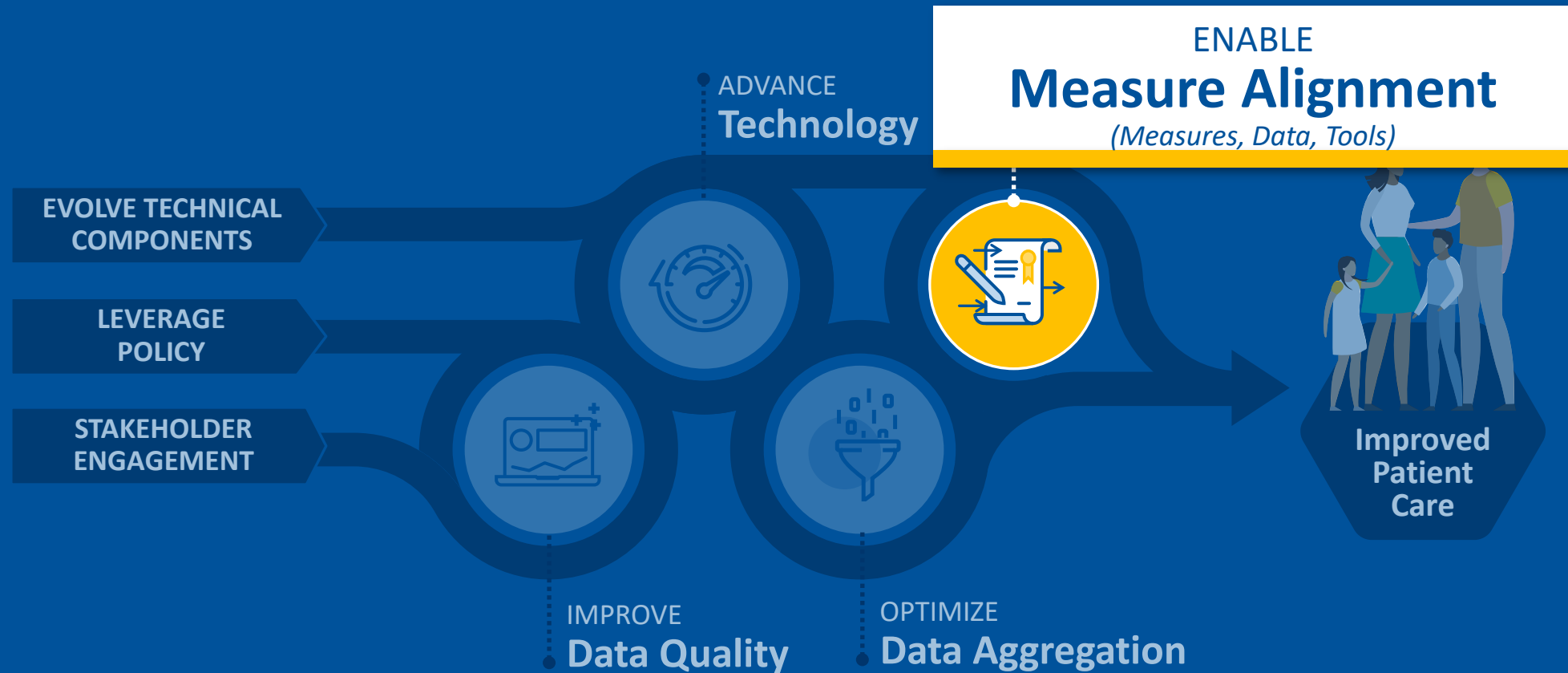- Transfer USCDI among payers by January 2022

1 Capture   2 Standardize   3 Share   4 Analyze   5 Interpret and Apply

Advanced Digital Quality Measurement

Strategic Roadmap

EVOLVE TECHNICAL COMPONENTS

LEVERAGE POLICY

STAKEHOLDER ENGAGEMENT

ADVANCE
Technology

ENABLE Measure Alignment

IMPROVE
Data Quality

OPTIMIZE
Data Aggregation

Improved Patient Care

CMS's active engagement with a broad set of stakeholders is critical to the success of developing, operationalizing, and maintaining the dQM Strategic Roadmap

Spectrum of Engagement

Collaborate — Share work on common objectives to identify opportunities for solution-building and co-create ideas to operationalize the Strategic Roadmap.
Goal: Enrich collaboration by co-designing (CMS, ONC) Strategic Roadmap operationalization plan and becoming informed about Federal measurement opportunities

PRE-ROLLOUT Consult — Understand the context, issues, and opportunities for fully digitizing CMS' quality measurement enterprise.
Goal: Solicit feedback on and build the Strategic Roadmap

Mobilize — Initiate participation to facilitate mutual learning, co-create ideas, and inform implementation.
Goal: Dialogue with experts with boots-on-ground experience to inform implementation

COMPLETE

CMS
ONC
Federal Initiatives in Progress *e.g. VA/DoD EHRM*
HHS *e.g. AHRQ, ASPE, CDC, FDA, HRSA, NIH, SAMHSA*
Other Federal Non-HHS *e.g. SSA*

Health IT Developers/ EHR Vendors
Payers
Data Aggregators
Patients/ Caregivers
Measure Developers
Consensus- and Standard- Setting Bodies
Providers & Healthcare Improvement Organizations

Full Digital Quality Measurement

Current Status

Acronym	Description
AHRQ	Agency for Healthcare Research and Quality
ASPE	Assistant Secretary for Planning and Evaluation
CDC	Centers for Disease Control and Prevention
EHRM	Electronic Health Record Modernization
FDA	United States Food and Drug Administration
HIMSS	Healthcare Information and Management Systems Society
HRSA	Health Resources and Services Administration
NIH	National Institutes of Health
SAMHSA	Substance Abuse and Mental Health Services Administration
SSA	United States Social Security Administration

Implementation of the actions across the four domains will position CMS to modernize its quality measurement enterprise

- **To enable transformation of CMS's quality measurement enterprise to entirely digital, CMS will build on ONC and CMS interoperability requirements to:**

  1. Obtain standardized, interoperable EHR data for quality measurement and expand standards and standards-based APIs for other digital data (for example, patient-generated health data);

  2. Redesign quality measurement tools to be self-contained applications that function in a service-oriented architecture and respect the architecture of provider FHIR API requirements mandated by CMS/ONC;

  3. Modernize processes and requirements to continue to support data aggregation; and

  4. Align data requirements, tools, and measures across reporting programs, government agencies, and the private sector.

- **These efforts will support advancing a LHS, and ultimately help improve patient care**

CMS — Centers for Medicare & Medicaid Services

ADVANCING DIGITAL QUALITY MEASUREMENT
STRATEGIC ROADMAP

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Timeline: Year 1 — Year 2 — Year 3 — Year 4 — Year 5 — Year 6 — And Beyond

DATA QUALITY
1 Capture · 2 Standardize · 3 Share · 4 Analyze · 5 Interpret and apply

- ONC — USCDI expansion, released every July, considered for SVAP (Repeats yearly)
- CMS — Define dQM data needs for USCDI consideration and identify data standards priorities for measurement via other pathways (USCDI+)
- Advance additional digital data sources and data standards to support digital measurement and other use cases
- ONC CMS — Advance USCDI+ use cases, as an extension to the USCDI
- Maintain and expand FHIR standards and Implementation Guides, and maintain alignment with interoperability standards (USCDI, USCDI+)

TECHNOLOGY
1 Capture · 2 Standardize · 3 Share · 4 Analyze · 5 Interpret and apply

- Map data and stand-up FHIR APIs
- CMS — Stand up FHIR server for Measure Calculation Tool (MCT) testing compliant with US-Core capabilities
- CMS — Expand dQMs, leveraging MCT infrastructure and validation
- CMS — Develop prototype MCT
- CMS — MCT development and testing
- MCT development and testing
- MCTs ready for production

DATA AGGREGATION
1 Capture · 2 Standardize · 3 Share · 4 Analyze · 5 Interpret and apply

- CMS — Identify role for aggregators for dQM
- Participate in the dQM enterprise
- CMS — Develop guidelines/processes for dQM data aggregation with input from third-party actors/data aggregators

MEASURE ALIGNMENT
1 Capture · 2 Standardize · 3 Share · 4 Analyze · 5 Interpret and apply

- CMS — Engage federal, state, and industry partners Focus: data, tool, measure alignment (Rapid-Cycle)
- Develop common dQM portfolio in consideration of data quality and interoperability
- CMS — Implement accountability measure of interoperability
- Use rapid-cycle feedback enabled by MCT to improve care (Rapid-Cycle)
- Public and private sector begin to implement common dQM portfolio, building on standardized data and interoperability requirements *(staged, as appropriate)*

IMPROVED PATIENT CARE — Full Digital Quality Measurement

STRATEGIC ROADMAP FOUNDATION

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