End-to-End Quality Measurement and Reporting Processes

9:15 AM – 10:45 AM
11:00 AM – 12:15 AM

Bob Dolin, MD
eQuality Project Executive
CMO, Lantana Consulting Group

Gaye Dolin, MSN, RN
eQuality SDO Liaison
Sr. Nurse Informaticist, Lantana Consulting Group

Objectives

- High level understanding of an idealized end-to-end quality reporting process

- Explore optional aspects, focusing on those likely to be relevant to Stage 2 Meaningful Use, including examples

- Implementation issues for eMeasure & QRDA
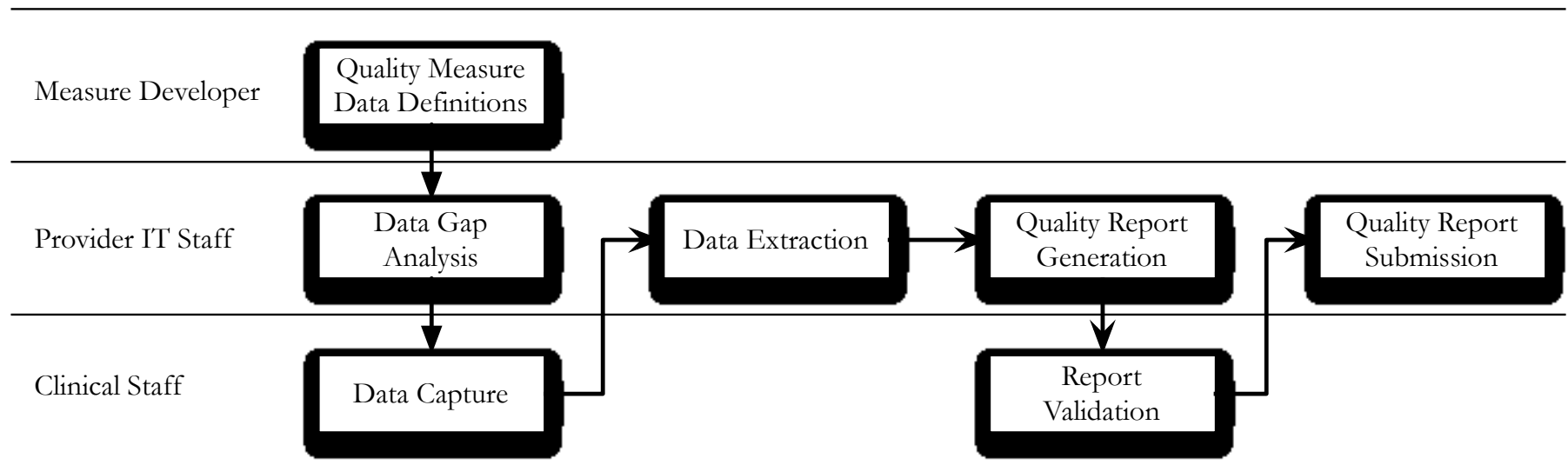
- Dialog/discussion
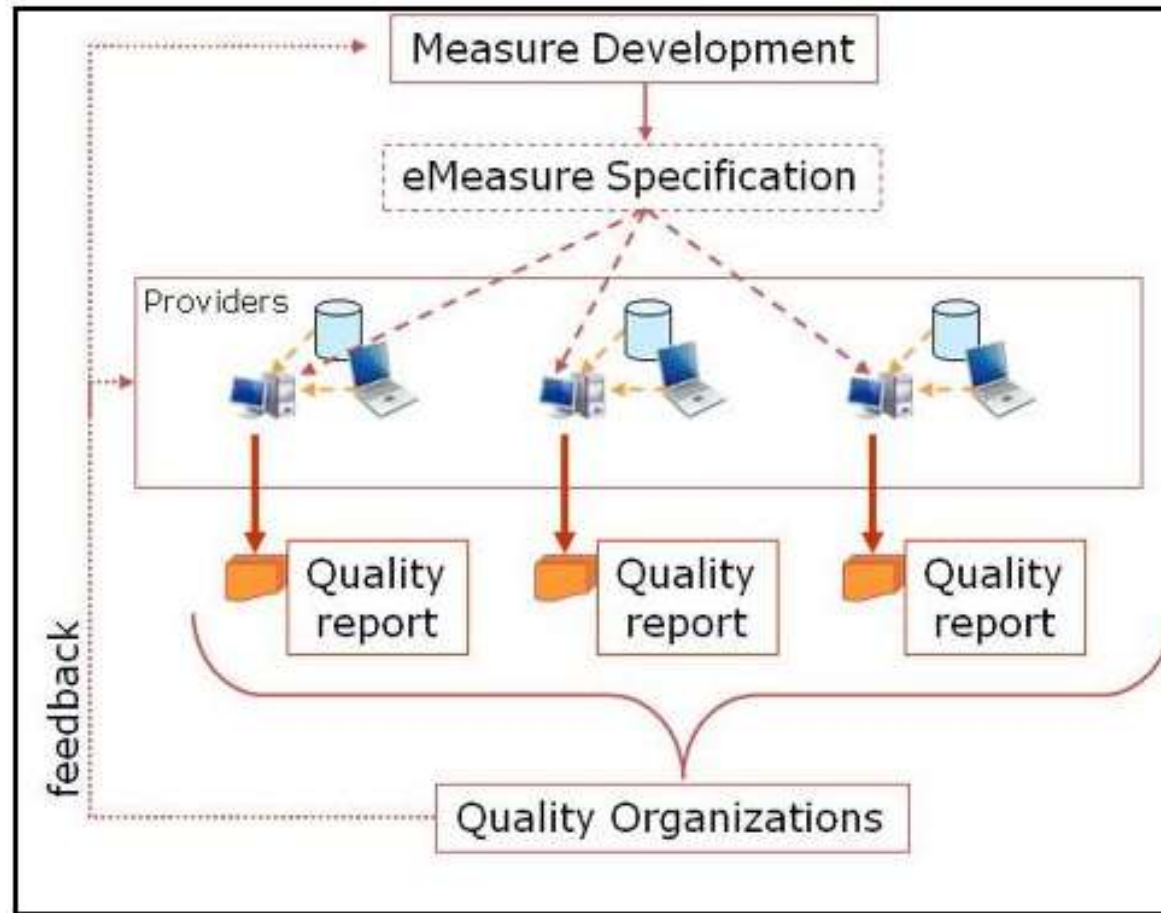
Quality Measurement and Reporting

Quality Measurement and Reporting

National Meaningful Use

Local EHR

Clinical reuse

Decision support

Secondary use
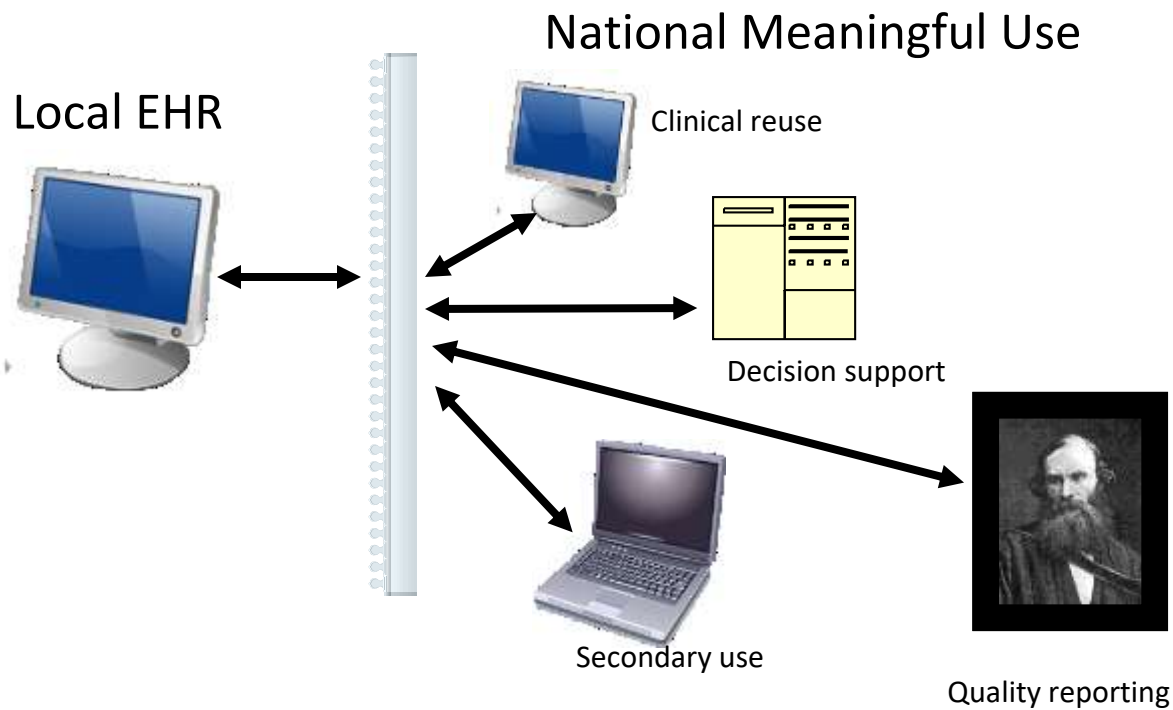
Quality reporting

Quality Reporting Process Workflow

Measure Developer	Quality Measure Data Definitions			
Provider IT Staff	Data Gap Analysis	Data Extraction	Quality Report Generation	Quality Report Submission
Clinical Staff	Data Capture		Report Validation	

Workflow Components

- Data preparation

- Data capture

- Export

- Calculate

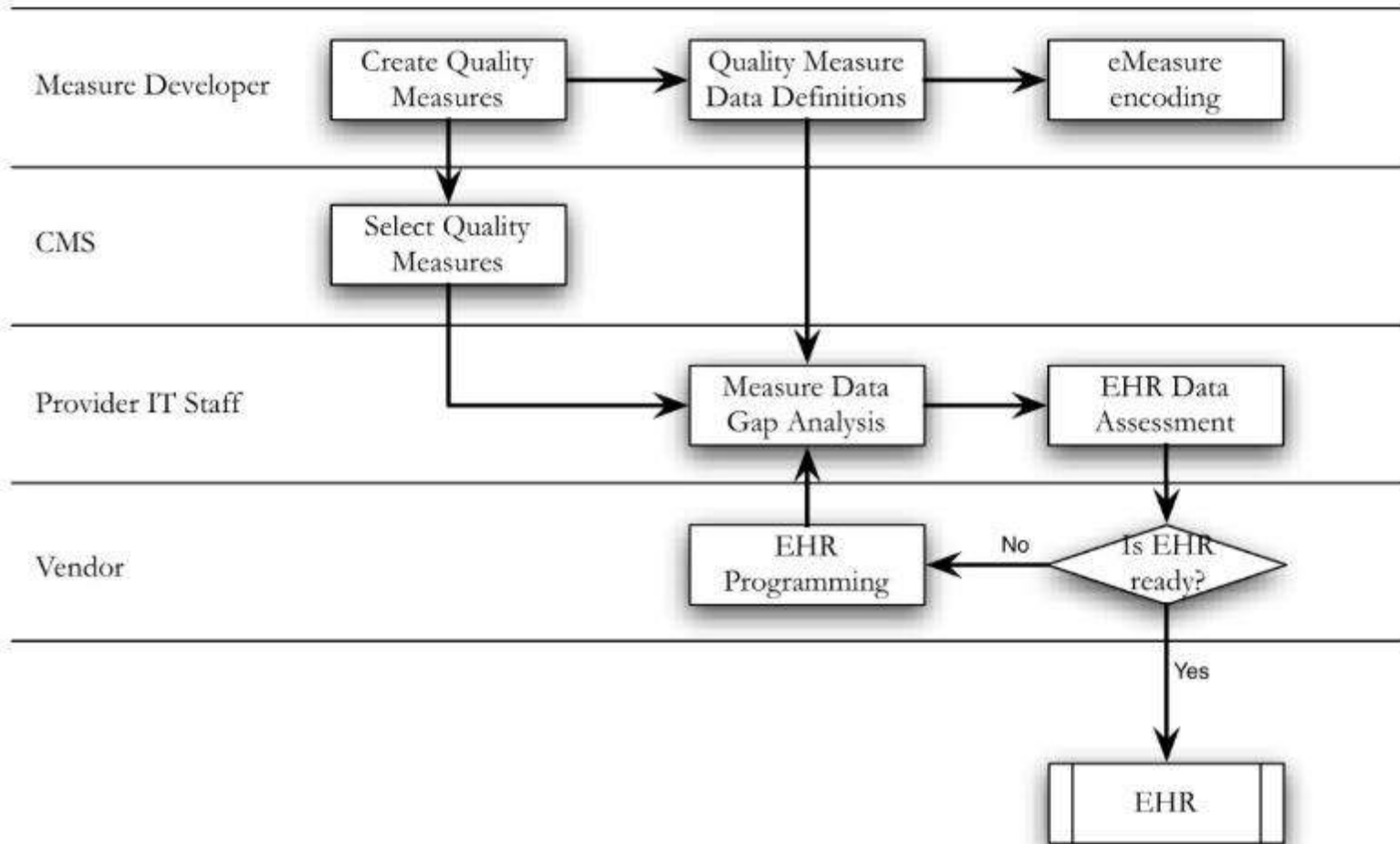- Report

Data Preparation

- Identify what data is necessary for the quality measure to be calculated

- Where required data is stored in the EHR system

- How the stored data is coded

- What data is not currently being collected in the EHR

- Reconcile reporting periods for measures

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# Data Preparation

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Data Capture

- There is no consensus on how quality data is collected and reported across EHR systems

- EHR systems are not monolithic

- They are complex and involve multiple modules that serve different processes

- EHR workflow varies significantly between products so it is important to not be prescriptive on how data is captured, but to focus on what data is captured

- Many EHR platforms are not heavily customizable

- End-users may be dependent upon the certified EHR to develop software modules that capture data necessary for reporting

Data Capture Workflow
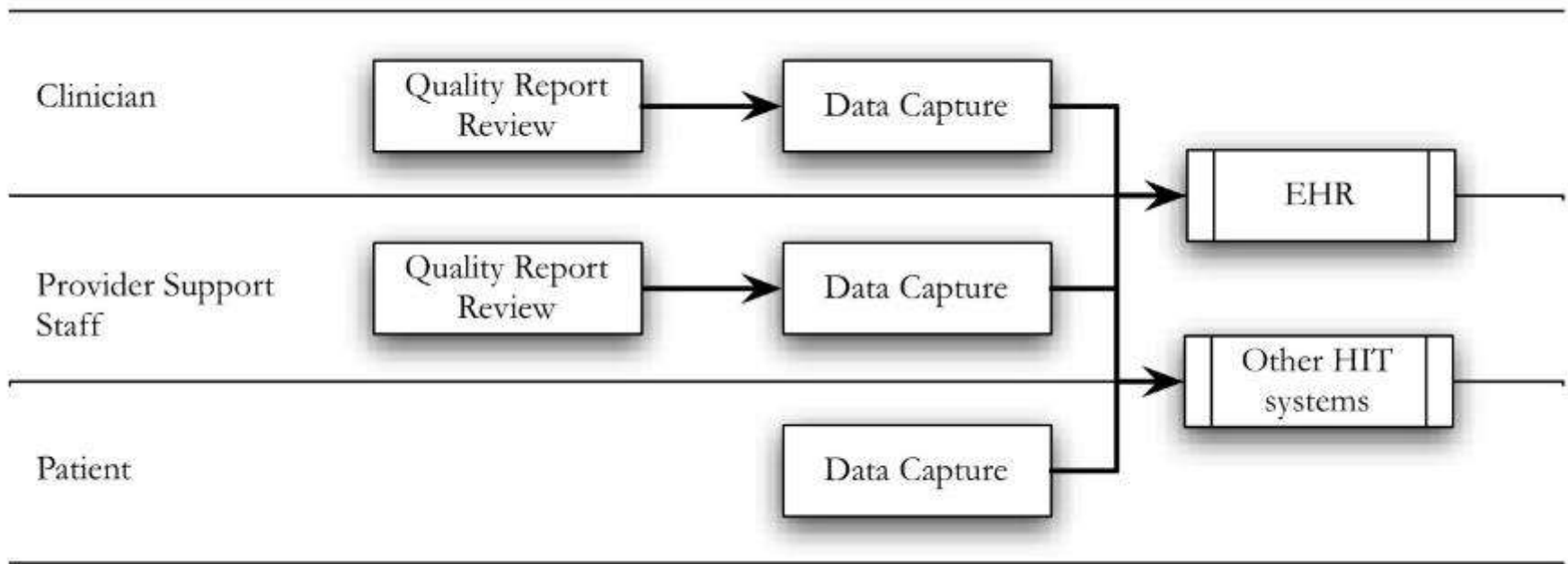
Export

- The export step is performed by the EHR

- The transform step may be performed by the EHR or by a third-party application (instance generator)

- Aggregation of QRDA I may be performed by the EHR or by a third-party application

- The NPRM's explicit recognition of an export step as a mandatory part of the workflow may have implications for EHRs that contain integral calculate functionality
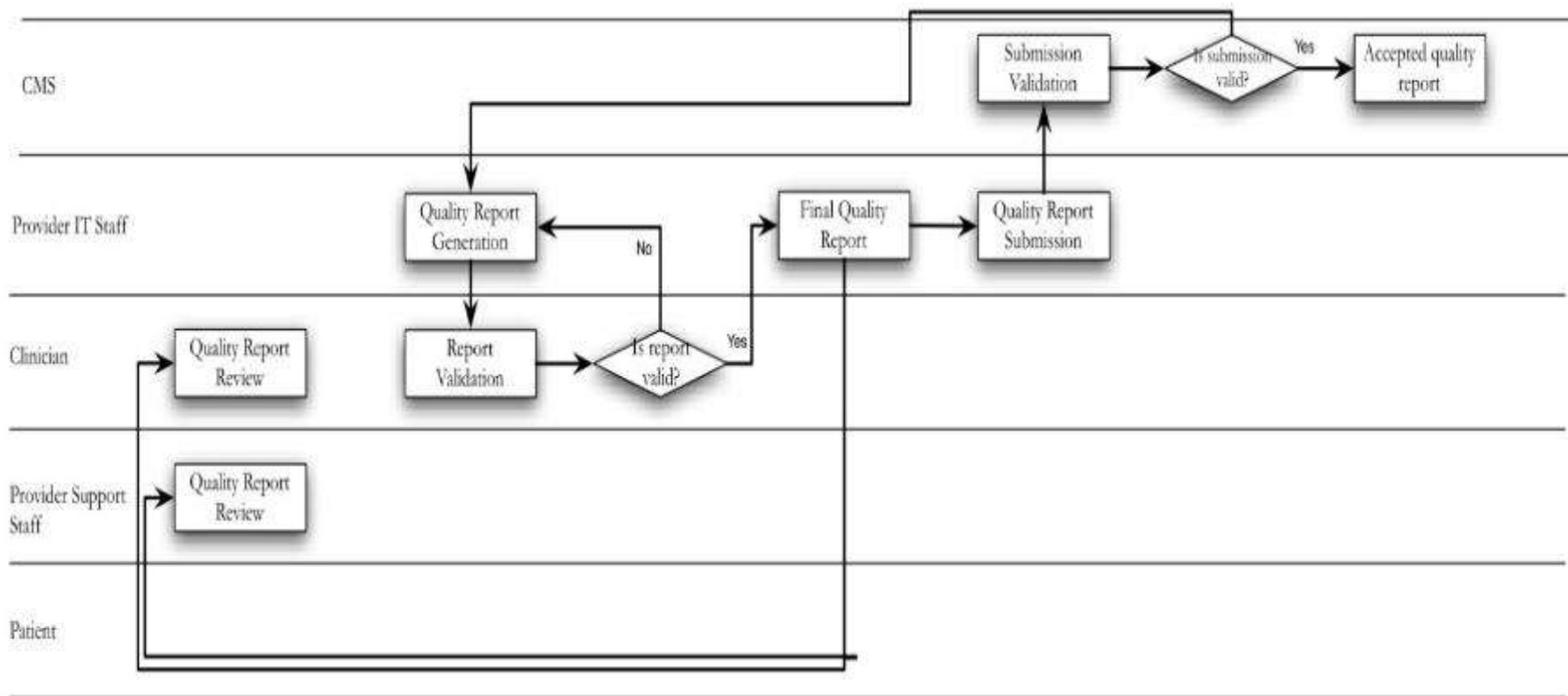
Export Workflow

Data Extraction **and** Calculate
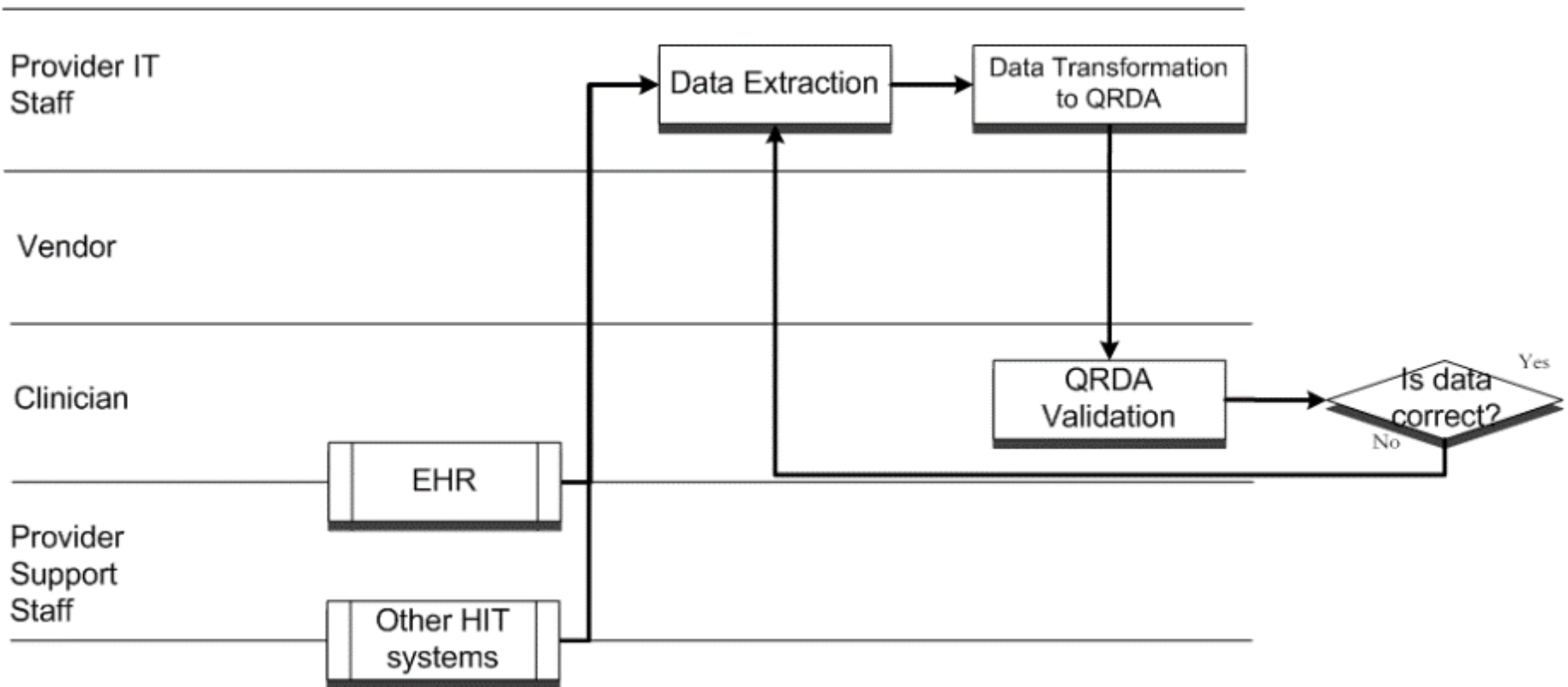
Reporting

- The final stage of the workflow is the validation and submission of the quality report
  - Created by provider
  - Validated by provider and/or support staff
  - Submitted
  - Receiving institution validates and accepts report

Reporting

Report

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Data Capture (example eMeasure 1)

- What data elements are relevant to NQF 0024?

- How will providers capture those data elements?

- How will the system remind or enforce the capture of those data elements?

Data Capture - example

- eMeasure informs what data to capture
  - Age
  - Encounter type
  - Pregnant?
  - BMI %ile
  - Counseling for nutrition, physical activity

Example eMeasure

Weight assessment AND counseling on nutrition and physical activity for children/adolescents (NQF 0024)

- Initial Patient Population
  - Age 2-17 during measurement period

- Denominator
  - Primary care outpatient encounter, AND
  - Not pregnant

- Numerator
  - BMI percentile recorded, AND
  - Counseling for nutrition, AND
  - Counseling for physical activity

Data Capture

eMeasure DOES NOT specify HOW to capture data

- BMI = weight (in kg) / height (in meters) ^2
- All valid approaches
  - Record weight in kg, height in meters; EHR calculates BMI %ile
  - Record weight in lbs, height in inches; EHR calculates BMI %ile
  - Record BMI %ile directly

eMeasure DOES suggest *WHERE* to capture data*

- Pregnancy: Diagnosis (problem list)
- BMI %ile: Physical exam finding
- * In general, where systems are not already capturing required data elements, we recommend that they follow the workflow implicit in the eMeasure.

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Data Capture

Workflow

- "counseling for physical activity"
- Who is providing the counseling?
- How to capture "counseling for physical activity" at point-of-care?
  - Free text?
  - Structured data entry?
- Who is designing the data entry forms?
  - EHR vendor
  - Clinician groups
- How are clinicians dealing with multiple (?conflicting) requests for structured data?

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Data Export (getting data out of the EHR)

MU2 NPRM:

"We request comment on whether any standards (e.g., QRDA category 1 or 2, or Consolidated CDA) would be adequate for CQM data export as well as whether Complete EHRs (that by definition would include calculation and reporting capabilities) should be required to be capable of data export".

Data Export (getting data out of the EHR)

- NQF 0024 has data elements not defined in the CCD.

- CCD templates simultaneously:
  - Have too much information
  - Not enough information

- Communication from provider to patient: counseling for nutrition

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Data Export (getting data out of the EHR)

What if NQF 0024 has data elements that aren't defined for use within CCD?

- A CCD can contain anything allowed by CDA. Certain patterns (e.g. problems, medications) have been constrained by templates to ensure consistency. Other patterns (e.g. counseling) are allowed, although there aren't yet corresponding CCD templates.

- But if not in a defined template specific to an eMeasure – the data received may be both unwanted and insufficient

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Data Export (getting data out of the EHR)

For instance, in the latest version of CCD (a.k.a. the "HL7 Implementation Guide for CDA® Release 2: IHE Health Story Consolidation, Release 1"), a date/time stamp is optional for Procedures:

```
<procedure classCode="PROC" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.22.4.14"/>
  <id root="e401f340-7be2-11db-9fe1-0800200c9a66"/>
  <code code="397394009" codeSystem="2.16.840.1.113883.6.96"
    displayName="Bronchoalveolar lavage"/>
  <statusCode code="completed"/>
</procedure>
```

Whereas in QRDA, we would add an additional constraint, as part of a further specialized template, that makes the date/time stamp be required:

```
<procedure classCode="PROC" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.22.4.14.2"/>
  <id root="e401f340-7be2-11db-9fe1-0800200c9a66"/>
  <code code="397394009" codeSystem="2.16.840.1.113883.6.96"
    displayName="Bronchoalveolar lavage"/>
  <statusCode code="completed"/>
  <effectiveTime value="02171998"/>
</procedure>
```

Data Export - Summary

Getting data out of EHR and into a quality report

- popHealth cannot yet use QDRA
  - Need to constrain Consolidated CCD templates
  - Need to enhance popHealth

- CCD will not work out of the box
  - Cannot represent counseling for nutrition/physical activity (for example)
  - Is not specific enough
    - Not all templates require time stamp
    - eMeasure may want active problem/ CCD will send all problems

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What to do?

QDM approach to QRDA

Quality reporting in *Meaningful Use*

Quality reporting is one of the components of *Meaningful Use*

- Use of certified EHR in a meaningful manner (e.g., e-prescribing)

- Use of certified EHR technology for electronic exchange of health information to improve quality of healthcare

- Use of certified EHR technology to submit clinical quality measures and other such measures selected by the Secretary

HQMF (eMeasure)

Health Quality Measure Format (HQMF)

- A standard for representing a health quality measure as an electronic document

- An HL7 Draft Standard for Trial Use (DSTU) since 2009

- Provides for quality measure consistency and unambiguous interpretation

- Derived from an overarching Structured Document Architecture; not a CDA standard

eMeasure: a health quality measure encoded in the HQMF format

HQMF (eMeasure)

<QualityMeasureDocument>

HQMF Header

HQMF Body
 <section>
  <title>Population criteria</title>
  <text>
  <entry>Initial Patient Population</entry>
  <entry>Denominator</entry>
  <entry>Numerator</entry>
  <entry>Exclusions</entry>

  …
 </section>
 <section>
  <title>Data criteria</title>
  <text>
  <entry>

  …
 </section>

  …
</QualityMeasureDocument>

Measure Development

eMeasure Specification

Providers

Quality report

Quality report

Quality report

feedback

Quality Organizations

eQuality

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Sample eMeasure HTML Rendition

Controlling High Blood Pressure (NQF 0018)

Controlling High Blood Pressure (NQF 0018)

EMeasure Name	Controlling High Blood Pressure	EMeasure Id	76bccfa7-273b-4932-8d4e-5253aa1dc79c
Version number	1	Set Id	aa066eed-e8f6-4fec-8084-61d3d1e8b6e2
Available Date	No information	Measurement Period	January 1, 20xx through December 31, 20xx
Measure Steward	National Committee for Quality Assurance		
Endorsed by	National Quality Forum		
Description	The percentage of patients 18-85 years of age who had a diagnosis of hypertension and whose BP was adequately controlled during the measurement year.		
Measure scoring	Proportion		
Measure type	Process		
Rationale	This measure assesses the percentage of patients demonstrating adequate control of systolic and diastolic blood pressure levels. Over 50 million Americans warrant treatment for high blood pressure, according to the NHANES survey (JNC-7 2003). Financially, hypertension and associated disorders and heath complications, such as coronary heart disease and congestive heart failure, cost the U.S. economy more than $100 billion each year. The United States Preventive Services Task Force (USPSTF) recommends that clinicians screen adults 18 and older for high blood pressure (2007). This guideline is further endorsed by research studies and clinical trials that have demonstrated decline in costly health outcomes as a direct result of improved blood pressure control. This measure is important in efforts to promote blood pressure control and improve quality of life.		
Clinical Recommendation Statement	The U.S. Preventive Services Task Force (USPSTF) recommends screening for high blood pressure in adults age 18 years and older. This is a grade A recommendation JNC-7: Treating SBP and DBP to targets that are <140/90 mmHg is associated with a decrease in CVD complications.		
Improvement notation	Higher score indicates better quality		
Measurement duration	12 month(s)		
Reference	U.S. Preventive Services Task Force. Screening for high blood pressure: U.S. Preventive Services Task Force reaffirmation recommendation statement. Ann Intern Med 2007 Dec 4;147(11):783-6.		
Reference	Prevention, Detection, Evaluation, and Treatment of High Blood Pressure The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. NIH Publication No. 035233 December 2003.		
Definition			

Table of Contents

- Population criteria
- Data criteria (QDS Data Elements)
- Summary Calculation

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Sample eMeasure HTML Rendition

End-End Quality Measurement & Reporting
April 24, 2012
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QRDA

HL7 CDA R2 Quality Reporting Document Architecture (QRDA)
- Specifies a framework for quality reporting
- Standardizes the representation of measure-defined data elements

QRDA Category 1 – Single Patient Report

- DSTU R1 Published 2008

    Reuses CCD templates where possible

- DSTU R2 – In HL7 Ballot now

    - Framework

    - QDM-Based QRDA

QRDA Category II – Patient List Report

   Not yet officially balloted

QRDA Category III – Calculated Report

   Not yet officially balloted

Sample Category I Report

QRDA Quality Report

Patient	Eve Everywoman

Date of birth	February 1, 1984	**Sex**	Female
Contact info	2222 Home Street Burlington, MA 02368, US Tel: (781)555-1212	**Patient IDs**	987654321 2.16.840.1.113883.19.5

Document Id	f2d5f971-d67a-4456-8833-213f01331ca0
Document Created:	March 5, 2011
Author	Henry Seven, MD
Contact info	1020 Healthcare Drive Burlington, MA 02368, US Tel: (555)555-1003
Informant	Nelda Nuclear
Contact info	2222 Home Street Burlington, MA 02368, US Tel: (555)555-1003
Legal authenticator	Virgil Verify, MD of Good Health Hospital signed at March 10, 2011
Document maintained by	Good Health Hospital

Table of Contents

- Measure Section
- Reporting Parameters
- Patient Data

Measure Section

eMeasure Title	NQF eMeasure Number	eMeasure Identifier (MAT)	eMeasure Version Number
Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period	0284	27	1

Reporting Parameters

- Reporting period: 01 Jan 2011 - 31 Dec 2011

Patient Data

Data Element	Value	Date/Time
Procedure, Performed: SCIP Major Surgical Procedure	Fragmentation in Esophagus, Percutaneous Approach	03/02/2011 9:00 - 03/02/2011 10:30
Encounter, Performed: Encounter	hospital admission	03/01/2011 9:00 -

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Sample QRDA Category II Report

QRDA Patient List Report

Document Id	e97b3d1a-5e97-4e50-8757-c8c7dc93b11c
Document Created:	May 13, 2008
Author	Good Health Processing Entity

Table of Contents

Reporting Parameters

- Reporting period: 01 Jan 2007 - 31 Dec 2007

Measure Section: Retinopathy of Prematurity

Description: Retinopathy of Prematurity (ROP) incidence in neonates; BW >= 1500gm.

PatientId	ROP Present?	Alive at Discharge?	Numerator	Denominator	Exclusion
123456789	YES	YES	YES	YES	NO
123456788	NO	YES	NO	YES	NO
123456787	NO	YES	NO	YES	NO
123456786	YES	YES	YES	YES	NO
123456785	NO	YES	NO	YES	NO
123456784	NO	YES	NO	YES	NO
123456783	EXCL	NO	EXCL	YES	YES
123456782	YES	YES	YES	YES	NO
123456781	NO	YES	NO	YES	NO
123456780	NO	YES	NO	YES	NO
123456779	NO	YES	NO	YES	NO
123456778	NO	YES	NO	YES	NO
123456777	YES	YES	YES	YES	NO
123456776	EXCL	NO	EXCL	YES	YES

Document maintained by	Good Health Clinic
Informant	Good Health Clinic
Legal authenticator	Good Health Clinic signed at May 13, 2008

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Sample QRDA Category III Report

QRDA Calculated Summary Report

Document Id	88414c01-715a-45bb-83bb-db7ac860fe9d
Document Created:	May 13, 2008
Author	Good Health Processing Entity

Table of Contents

Reporting Parameters

- Reporting period: 01 Jan 2007 – 31 Dec 2007
- Aggregation level: Healthcare professional
- Aggregation level: Site of care

Measure Section: BP Control in HTN (140/90)

Description: Patients >= 18 years of age with hypertension, without IVD or Diabetes who have a BP < 140/90.

Provider	Location	Numerator	Denominator	Exclusions-Diabetes	Exclusions-IVD	Exclusions-Total	Percentage
Jones	Good Health Clinic	4	39	2	0	2	10.26
Smith	Good Health Clinic	24	28	0	0	0	85.71

Measure Section: A1C Control <7%

Description: Patients 18-75 years of age with diabetes who had at least one HgA1C measured in the past 12 months below 7.0%.

Provider	Location	Numerator	Denominator	Exclusions	Percentage
Jones	Good Health Clinic	28	33	3	80.00
Smith	Good Health Clinic	24	28	0	85.71

Measure Section: BP control in DM (130/80)

Description: Patients 18-75 years of age with a diagnosis of diabetes with the most recent BP below 130 systolic and 80 diastolic in the past year.

Provider	Location	Numerator	Denominator	Exclusions	Percentage
Jones	Good Health Clinic	37	40	1	92.50
Smith	Good Health Clinic	24	28	0	85.71

Measure: Asthma control (18-56 yrs)

Description: Patients 18-56 years of age with persistent asthma who were prescribed appropriate medication, including methylxanthines.

Provider	Location	Numerator	Denominator	Exclusions	Percentage
Jones	Good Health Clinic	33	37	0	89.19
Smith	Good Health Clinic	24	28	0	85.71

| Document maintained by	Good Health Clinic
Informant	Good Health Clinic
Legal authenticator	Good Health Clinic signed at May 13, 2008

eMeasure and QRDA

eMeasure provides the rules for determining if a particular patient is included in one of these populations:

- Initial Patient Population (IPP)
- Denominator (DENOM)
- Numerator (NUM)

The QRDA contains sufficient data elements to determine if the patient meets IPP, DENOM, or NUM criteria.

Quality Measurement and Reporting
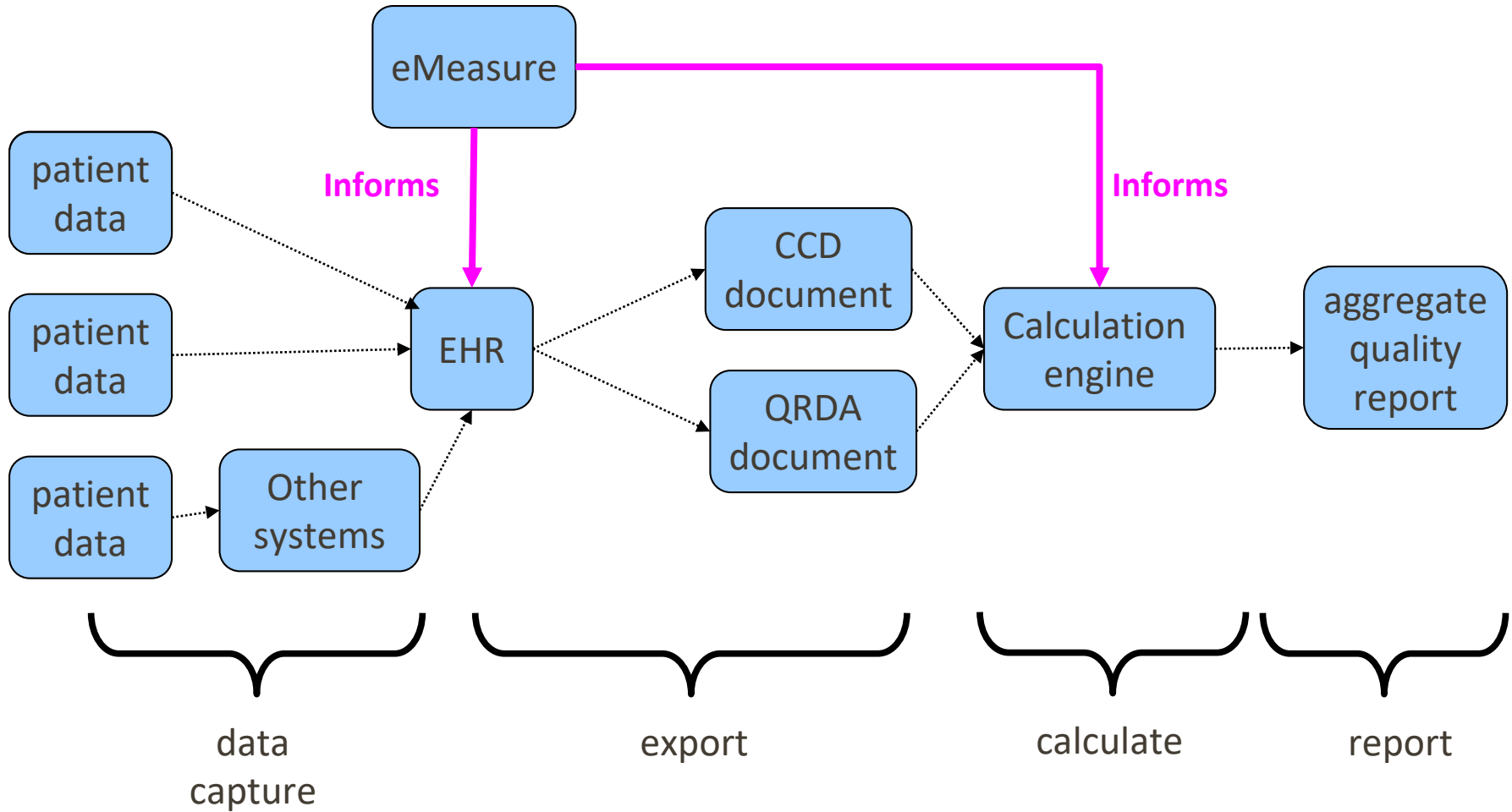
Data Extraction – CCD vs. QRDA

CCD	QRDA
Communicates patient level data	Communicates patient level data
Built to support Transition of Care	Built to support Quality Reporting
Includes a complete set of summary data	Data specific to one or more eMeasures
Currently able to be consumed by popHealth	Not yet able to be consumed by popHealth
Cited in Meaningful Use Stage 1	May be cited in Meaningful Use Stage 2
Comprised of "CDA templates" drawn from a common CDA template library	Comprised of "CDA templates" drawn from a common CDA template library and specified for quality data
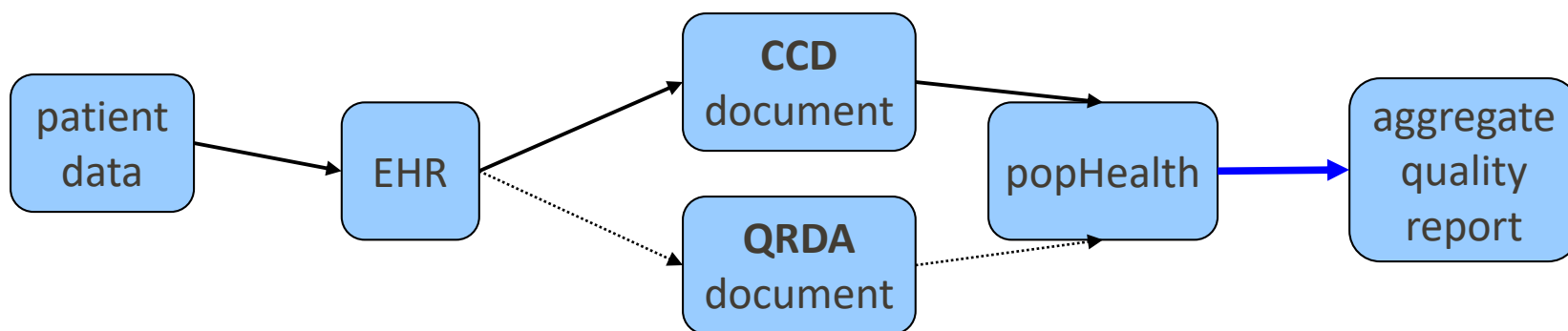
QRDA vs. eMeasure

HQMF Standard

eMeasures
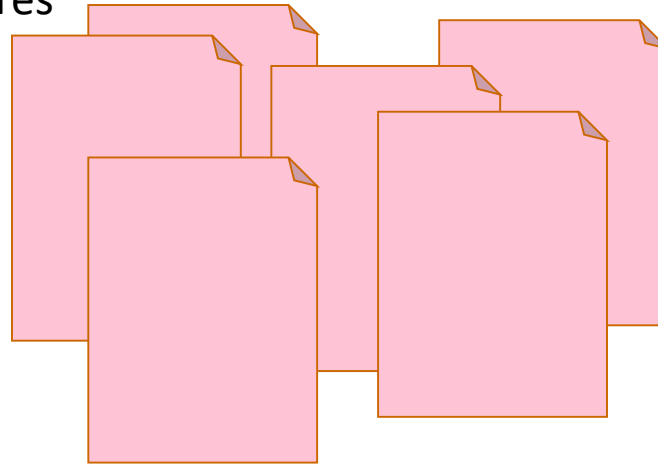
QRDA Standard

QRDA IGs

QRDA Instances

QDM-based QRDA IG

Coupling Between eMeasure and QRDA

National Quality Forum (NQF)

NQF Quality Data Model (QDM)
- Quality Data Type
- Quality Data Type
- Quality Data Type

Pattern Library
- Pattern
- Pattern
- Pattern

Instantiate (e.g., vocabulary binding)

eMeasure

Data Criteria
- Quality Data Element
- Quality Data Element
- Quality Data Element

Population Criteria
- Denominator
- Numerator
- Initial Patient Population

CDA Template Library
- QRDA Template
- QRDA Template
- QRDA Template

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Coupling Between eMeasure and QRDA

eMeasure to QDM-Based QRDA Example

eMeasure Coupled QRDA Instance
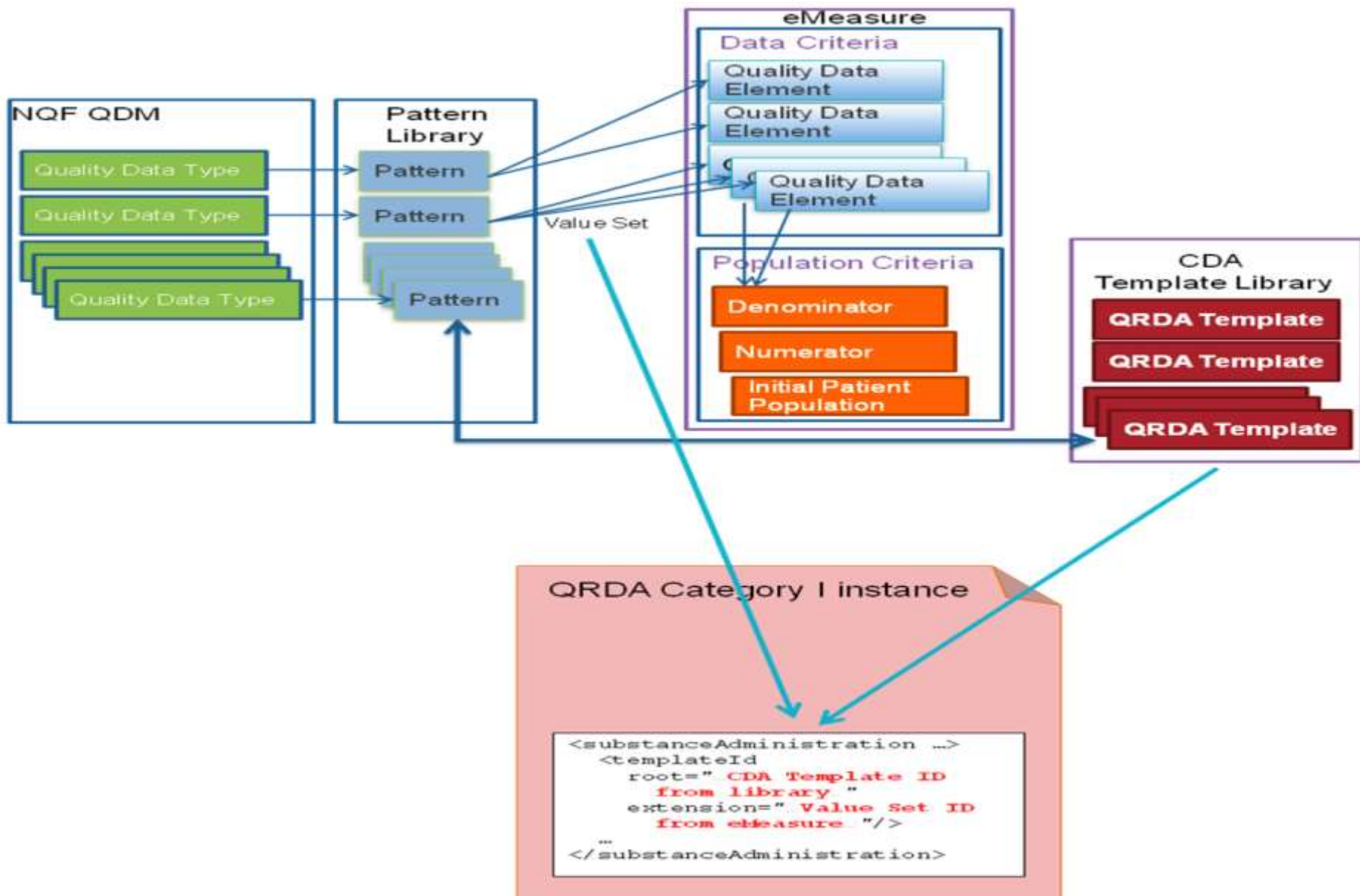
NQF 0284 eMeasure: Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period

eMeasure Title	Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period		
eMeasure Identifier (Measure Authoring Tool)	27	eMeasure Version number	1
NQF Number	0284	GUID	9a02f5d4-3d9b-11e1-8634-00237d5bf174
Measurement Period	January 1, 20xx through December 31, 20xx		
Measure Steward	Centers for Medicare & Medicaid Services (CMS)		
Measure Developer	Oklahoma Foundation for Medical Quality		
Endorsed By	National Quality Forum		
Description	Surgery patients on beta-blocker therapy prior to arrival who received a beta-blocker during the perioperative period.		
Copyright	None		
Disclaimer	None		

QRDA Containing NQF 0284: Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period

Quality Report

Patient	Eve Everywoman		
Date of birth	February 1, 1984	Sex	Female
Contact info	2222 Home Street Burlington, MA 02368, US Tel: (781)555-1212	Patient IDs	987654321 2.16.840.1.113883.19.5
Document Id	f2d5f971-d67a-4456-8833-213f01331ca0		
Document Created:	March 5, 2011		
Author	Henry Seven, MD		
Contact info	1020 Healthcare Drive Burlington, MA 02368, US Tel: (555)555-1003		
Informant	Nelda Nuclear		
Contact info	2222 Home Street Burlington, MA 02368, US Tel: (555)555-1003		
Legal authenticator	Virgil Verify, MD of Good Health Hospital signed at March 10, 2011		
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Measure Section

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Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period	0284	27	1

NQF 0284 eMeasure Identification

Document ID:
`<id root="8a4d92b2-356d-a09e-0135-8d45f1975952"/>`
Document Code:
`<code code="57024-2" codeSystem="2.16.840.1.113883.6.1" displayName="Health Quality Measure Document"/>`
Measure Name:
`<title>Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period</title>`
Set ID and Version Number:
`<setId root="9a02f5d4-3d9b-11e1-8634-00237d5bf174"/>`
`<versionNumber value="1"/>`

QRDA – references NQF 0284 eMeasure

```
<reference typeCode="REFR">
  <externalDocument classCode="DOC" moodCode="EVN">
  <!-- This is the version specific identifier for eMeasure: QualityMeasureDocument/id
    it is a GUID-->
   <id root="8a4d92b2-356d-a09e-0135-8d45f1975952"/>
    <!-- This is the NQF Number, root is an NQF OID and for eMeasure Number and
     extension is the eMeasure's NQF number -->
     <id root="2.16.840.1.113883.3.560.1" extension="0284"/>
      <!-- eMeasure Measure Authoring Tool Identifier (not the real root yet-->
     <id root="TempMATtoolrootOID" extension="27"/>
       <!--  HQMF Document code -->
     <code code="57024-2" codeSystem="2.16.840.1.113883.6.1" displayName="Health Quality Measure Document"/>
      <!-- This is the title of the eMeasure -->
     <text>Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative
      Period</text>
        <!--  QualityMeasureDocument/setId is the eMeasure version neutral id  -->
        <setId root="9a02d77a-3d9b-11e1-8634-00237d5bf174"/>
     <!-- This is the sequential eMeasure Version number -->
<versionNumber value="1"/>
</externalDocument>
</reference>
```
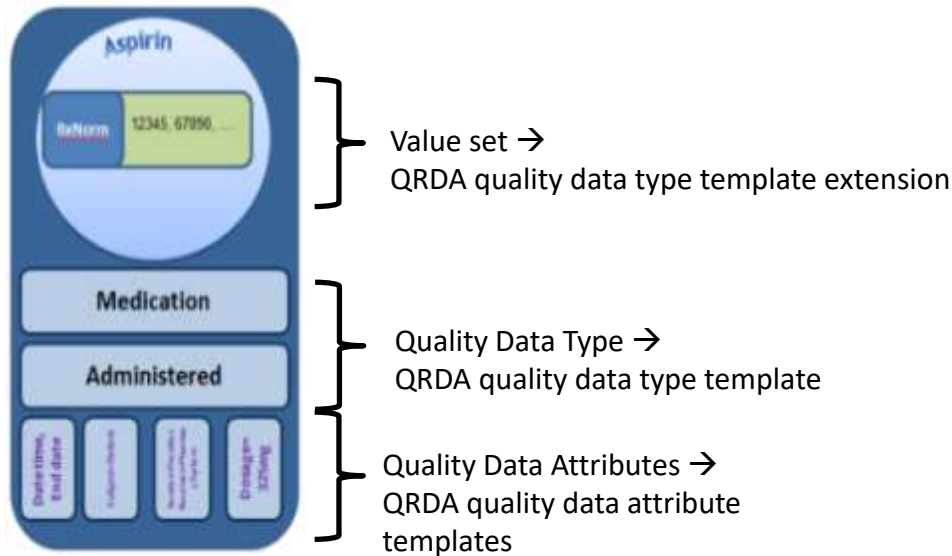
QDM Pattern → QRDA Pattern

Value set →
QRDA quality data type template extension

Quality Data Type →
QRDA quality data type template

Quality Data Attributes →
QRDA quality data attribute templates

QDM component	HQMF ID	QRDA ID
Quality Data Type: Medication Administered	2.16.840.1.113883.3.560.1.14	**2.16.840.1.113883.10.20.12.6.42**
Quality Data Attribute: Reason	None	2.16.840.1.113883.10.20.12.6.49
Value Set: Aspirin RxNorm codes	1.2.3.4.5.6.7	**1.2.3.4.5.6.7**

```
<substanceAdministration classCode="SBADM" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.12.6.42"
extension="1.2.3.4.5.6.7"/>
  <id />
  <statusCode code="completed"/>
  <effectiveTime>
    <low />
    <high />
  </effectiveTime>
  <participant typeCode="CSM">
    <participantRole classCode="MANU">
      <playingEntity classCode="MMAT" determinerCode="INSTANCE">
        <code code="..."
codeSystem="2.16.840.1.113883.3.560.101.1" />
      </playingEntity>
    </participantRole>
  </participant>
</substanceAdministration>
```

NQF 0284 eMeasure – Population Criteria

Population criteria

- **Initial Patient Population =**
  - AND: "Encounter, Performed: Encounter Inpatient (discharge datetime)" during "Measurement Period"
  - AND: "Patient Characteristic: birth date" >= 18 year(s) starts before start of "Encounter, Performed: Encounter Inpatient"
  - AND: "Procedure, Performed: SCIP Major Surgical Procedure (ordinality: 'Principal')" during "Encounter, Performed: Encounter Inpatient"
  - AND: "Encounter, Performed: Encounter Inpatient (length of stay <= 120 day(s))" during "Measurement Period"
- **Denominator =**
  - AND: "Initial Patient Population"
  - AND: "Medication, Active: Beta Blocker" starts before start of "Encounter, Performed: Encounter Inpatient"
- **Denominator Exclusions =**
  - OR: "Patient Characteristic: Clinical Trial Participant" during "Encounter, Performed: Encounter Inpatient"
  - OR: "Procedure, Performed: Heart Transplant And Ventricular-Assist-Device Procedure (ordinality: 'Principal')" during "Encounter, Performed: Encounter Inpatient"
  - OR: "Procedure, Performed: SCIP Major Surgical Procedure" starts before start of "Encounter, Performed: Encounter Inpatient"
  - OR:
    - AND: "Patient Characteristic: Patient Expired" starts after start of "Procedure, Performed: SCIP Major Surgical Procedure"
    - AND: "Patient Characteristic: Patient Expired" <= 6 hour(s) starts after end of "Procedure, Performed: SCIP Major Surgical Procedure"
  - OR:
    - AND: "Diagnosis, Active: Pregnancy" during "Encounter, Performed: Encounter Inpatient"
    - AND: "Medication, Active: Beta Blocker" starts before start of "Encounter, Performed: Encounter Inpatient"
  - OR:
    - AND: "Encounter, Performed: Encounter Inpatient" < 2 day(s) ends after end of "Procedure, Performed: SCIP Major Surgical Procedure"
    - AND:
      - OR: "Medication, Administered not done: Grouped Reasons For Not Taking Beta Blocker" for "Beta Blocker RxNorm Value Set" <= 1 day(s) starts befor

NQF 0284 eMeasure – Data Criteria

Data criteria (QDM Data Elements)

- "Diagnosis, Active: Pregnancy" using "Pregnancy Grouping Value Set (2.16.840.1.113883.3.600.0001.18)"
- "Encounter, Performed: Encounter Inpatient" using "Encounter Inpatient SNOMED-CT Value Set (2.16.840.1.113883.3.666.05.625)"
- "Medication, Active: Beta Blocker" using "Beta Blocker RxNorm Value Set (2.16.840.1.113883.3.117.35)"
- "Medication, Administered: Beta Blocker" using "Beta Blocker RxNorm Value Set (2.16.840.1.113883.3.117.35)"
- "Medication, Administered not done: Grouped Reasons For Not Taking Beta Blocker" using "Grouped Reasons For Not Taking Beta Blocker Grouping Value Set (2.16.840.1.113883.3.117.1.7.1.13)"
- "Patient Characteristic: birth date" using "birth date LOINC Value Set (2.16.840.1.113883.3.560.100.4)"
- "Patient Characteristic: Clinical Trial Participant" using "Clinical Trial Participant SNOMED-CT Value Set (2.16.840.1.113883.3.526.2.643)"
- "Patient Characteristic: Patient Expired" using "Patient Expired SNOMED-CT Value Set (2.16.840.1.113883.3.67.1.101.1.78)"
- "Procedure, Performed: Heart Transplant And Ventricular-Assist-Device Procedure" using "Heart Transplant And Ventricular-Assist-Device Procedure ICD-9 Value Set (2.16.840.1.113883.3.117.46)"
- "Procedure, Performed: SCIP Major Surgical Procedure" using "SCIP Major Surgical Procedure Grouping Value Set (2.16.840.1.113883.3.117.1.7.1.2)"
- Attribute: "Ordinality: Principal" using "Principal SNOMED-CT Value Set (2.16.840.1.113883.3.117.1.7.1.14)"

QRDA Containing NQF 0284 - Patient Data

Patient Data

| Data Element	Value	Date/Time
Procedure, Performed: SCIP Major Surgical Procedure	Fragmentation in Esophagus, Percutaneous Approach	03/02/2011 9:00 - 03/02/2011 10:30
Encounter, Performed: Encounter Inpatient	hospital admission	03/01/2011 9:00 - 03/03/2011 10:30
Medication, Active: Beta Blocker	Betaxolol	02/01/2011 - 02/28/2011
Medication, Administered: Beta Blocker	Betaxolol	03/01/2011
Patient Characteristic Payer	Medicare	03/03/2011

NQF 0284 eMeasure – Data Type Pattern

```
<procedure classCode="PROC" moodCode="EVN" isCriterionInd="true">
        <code code="2.16.840.1.113883.3.117.1.7.1.2" displayName="SCIP Major Surgical Procedure Grouping Value Set"
        codeSystem="2.16.840.1.113883.3.560.101.1"/>
            <title>Procedure, Performed: SCIP Major Surgical Procedure (ordinality: 'Principal')</title>
            <sourceOf typeCode="SUBJ">
              <observation classCode="OBS" moodCode="EVN" isCriterionInd="true">
                <templateId root="2.16.840.1.113883.3.560.1.1012.2"/>
            <code code="117363000" codeSystem="2.16.840.1.113883.6.96" displayName="ordinality" codeSystemName="SNOMED-CT"/>
                <value xsi:type="CD" code="2.16.840.1.113883.3.117.1.7.1.14" codeSystem="2.16.840.1.113883.3.560.101.1"
            displayName="Principal"/>
              </observation>
             </sourceOf>
             …
         </procedure>
```

QRDA Containing NQF 0284 - CDA Template

```
<!-- QRDA Procedure, Performed -->
  <procedure classCode="PROC" moodCode="EVN">
  <!-- Consolidated Procedure Activity Procedure TemplateId (Implied Template) -->
  <templateId root="2.16.840.1.113883.10.20.22.4.14"/>
    < !-- QRDA TemplateId -->
   <templateId root="2.16.840.1.113883.10.20.24.3.64" extension="2.16.840.1.113883.3.117.1.7.1.2"/>
   <id root="d68b7e32-7810-4f5b-9cc2-acd54b0fd85d"/>
     <code code="0DF53ZZ" codeSystem="2.16.840.1.113883.6.3" displayName="Fragmentation in Esophagus, Percutaneous
Approach"/>
        <text>Procedure, Performed: Fragmentation in Esophagus, Percutaneous Approach (ordinality: 'Principal')</text>
      <statusCode code="completed"/>
     <effectiveTime>
        <!-- Attribute: Start Datetime -->
        <low value="20110302090000+0500"/>
         <!-- Attribute: End Datetime -->
         <high value="20110302103000+0500"/>
     </effectiveTime>
     <!-- Attribute: ordinality -->
      <priorityCode code="63161005" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED-CT" displayName="Principal"/>
  </procedure>
```

Data Reporting under MU2
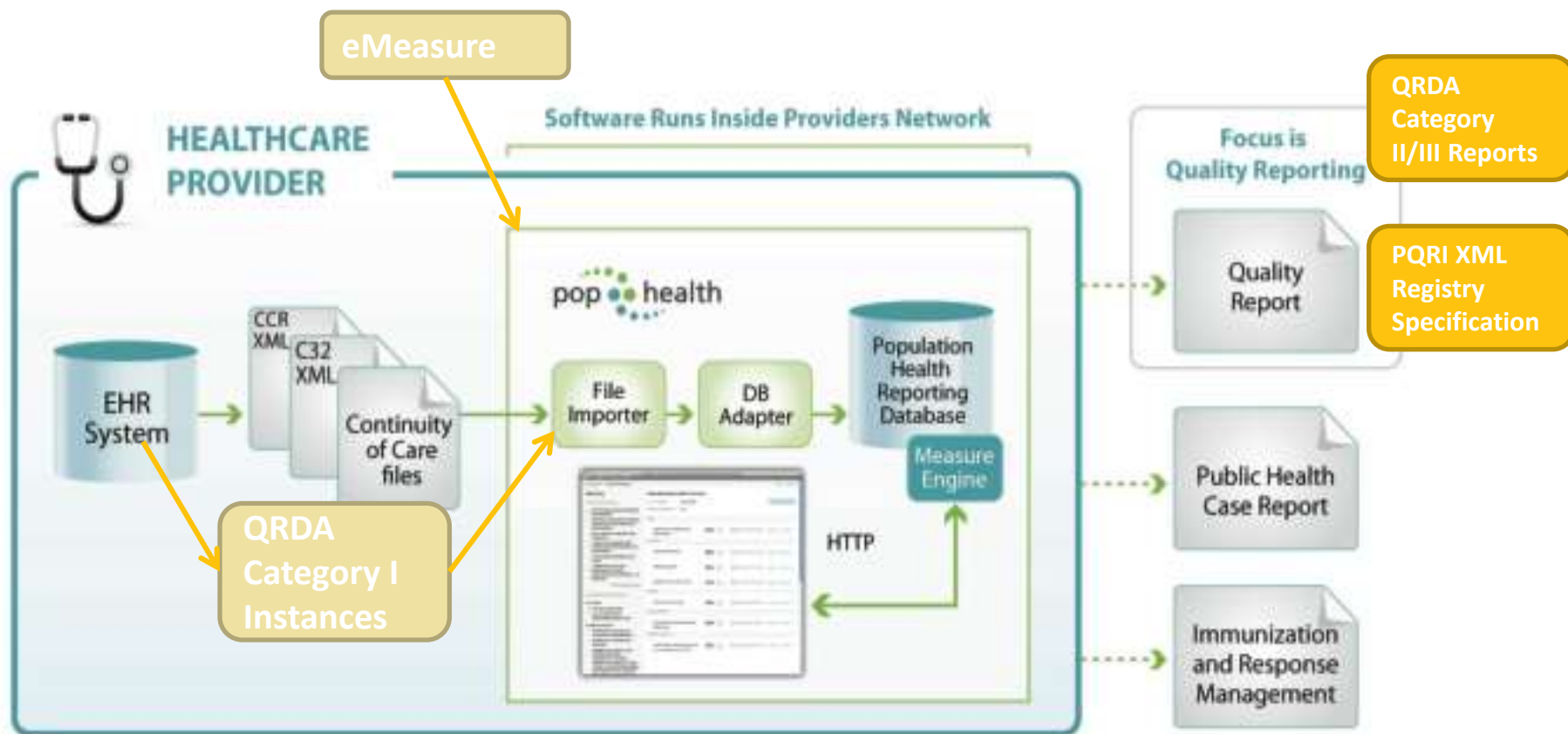
Implementation – Simplifying the Export Step

eSpec Navigator

Download Implementation Guide

Measure	Description	Steward	Version	Package
Statin Prescribed at Discharge	Acute myocardial infarction (AMI) patients who are prescribed a statin at hospital discharge.	Oklahoma Foundation for Medical Quality	0	AMI-10 NQF0639 Statin Prescribed at Discharge.zip
Aspirin Prescribed at Discharge	Acute myocardial infarction (AMI) patients who are prescribed aspirin at hospital discharge	Oklahoma Foundation for Medical Quality	0	
Beta-Blocker Prescribed at Discharge	Acute myocardial infarction (AMI) patients who are prescribed a beta-blocker at hospital discharge	Oklahoma Foundation for Medical Quality	0	
Relievers for Inpatient Asthma	Use of relievers in pediatric patients admitted for inpatient treatment of asthma	Joint Commission	0	CAC-1 NQF0143 Relievers for Inpatient Asthma.zip
Systemic Corticosteroids for Inpatient Asthma	Use of systemic corticosteroids in pediatric patients admitted for inpatient treatment of asthma.	Joint Commission	0	CAC-2 NQF0144 Corticosteroids.zip
Home Management Plan of Care (HMPC) Document Given to Patient/Caregiver	An assessment that there is documentation in the medical record that a Home Management Plan of Care (HMPC) document was given to the pediatric asthma patient/caregiver.	Joint Commission	0	CAC-3 NQF0338 Plan of Care Document Given To Patient.zip
Exclusive Breast Milk Feeding	Exclusive breast milk feeding during the newborn's entire hospitalization	Joint Commission	0	PC-05 NQF0480 Exclusive Breast Milk Feeding.zip

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Implementation

Measure	Description	Steward	Version	Package
Statin Prescribed at Discharge	Acute myocardial infarction (AMI) patients who are prescribed a statin at hospital discharge.	Oklahoma Foundation for Medical Quality	0	AMI-10 NQF0639 Statin Prescribed at Discharge.zip

Data Elements   Measure

Quality Data Element	Code System	Value Set	Value Set Oid
Diagnosis, Active: AMI	Grouping	AMI Grouping Value Set	2.16.840.1.113883.3.117.1.7.1.833
Encounter, Performed: Encounter Inpatient	SNOMED-CT	Encounter Inpatient SNOMED-CT Value Set	2.16.840.1.113883.3.117.1.7.1.28
Encounter, Performed: Left Against Medical Advice	SNOMED-CT	Left Against Medical Advice SNOMED-CT Value Set	2.16.840.1.113883.3.117.1.7.1.850
Laboratory Test, Result: LDL-c Test	SNOMED-CT	LDL-c Test SNOMED-CT Value Set	2.16.840.1.113883.3.117.1.7.1.799
Medication, Order: Statins	RxNorm	Statins RxNorm Value Set	2.16.840.1.113883.3.117.1.7.1.824
Medication, Order not done: Medical Reasons	SNOMED-CT	Medical Reasons SNOMED-CT Value Set	2.16.840.1.113883.3.117.1.7.1.18
Medication, Order not done: Patient Reasons	SNOMED-CT	Patient Reasons SNOMED-CT Value Set	2.16.840.1.113883.3.117.1.7.1.19
Medication, Order not done: System Reasons	SNOMED-CT	System Reasons SNOMED-CT Value Set	2.16.840.1.113883.3.117.1.7.1.20
Patient Characteristic Birthdate: birth date	LOINC	birth date LOINC Value Set	2.16.840.1.113883.3.560.100.4

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Implementation

eSpec Navigator

| Measure	Description	Steward	Version	Package
Statin Prescribed at Discharge	Acute myocardial infarction (AMI) patients who are prescribed a statin at hospital discharge.	Oklahoma Foundation for Medical Quality	0	AMI-10 NQF0639 Statin Prescribed at Discharge.zip

Data Elements   Measure

Statin Prescribed at Discharge (0639)

eMeasure Name	Statin Prescribed at Discharge	eMeasure Id	8a4d92b2-35fb-4aa7-0136-1df6d8c7025
Version number	0	eMeasure Set Id	ebfa203e-acc1-4228-90
Available Date	No information	Measurement Period	January 1, 20xx through 20xx
Measure Steward	Oklahoma Foundation for Medical Quality		
Endorsed by	National Quality Forum		
Description	Acute myocardial infarction (AMI) patients who are prescribed a statin at hospital discharge.		
Copyright	TBD		
Disclaimer	TBD		
Measure Scoring	Proportion		
Measure Type	Process		
Stratification	None.		

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Implementation Tools - Future

- HQMF Processing Engine

- QRDA Instance Generator
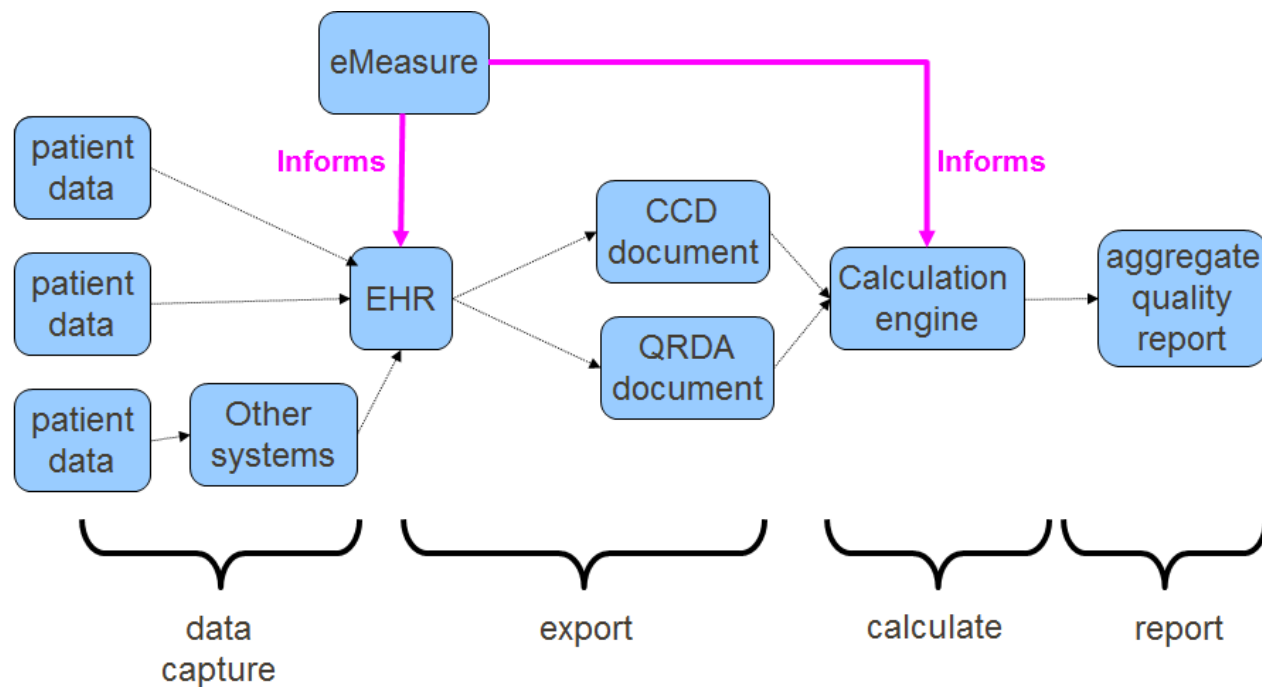
Conclusions

Data Capture

The single most important factor in streamlining the end to end quality reporting process:

Convergence on a consistent set of data elements

- Across MU criteria

- Across quality measures

- Across other regulatory requirements

- ...

Conclusions

Export

- We recommend the adoption of QRDA Category I for the Export step

- We propose that the eSpecification Navigator be further investigated as a tool to simplify the Export step

- The NPRM's explicit requirement of an export step followed by an import step as a mandatory part of the workflow may have implications for EHRs that contain integral calculate functionality

Conclusions

Calculations:

- We recommend against the use of CCD for the Export step

- We recommend the further development of an HQMF Processing Engine, which can consistently parse an HQMF eMeasure and convert it into queries against an application's data stores

Conclusions

Reporting:

- We recommend enhancing PopHealth so that it can serve as a complete prototype / reference implementation of the end to end processes we've discussed

- We recommend that PopHealth functionality be expanded to produce those aggregate XML reports required by CMS.

Conclusions

In Closing:

While considerable effort has gone into defining end to end quality reporting processes and technology, those efforts can fall short if not also coupled with:

- A convergence of data elements to streamline the data capture process
- Resolution of conflicting and ambiguous requirements
- Getting past the inconsistencies and discrepancies in various regulatory requirements
- Moving to a defined and formal "source of truth"
  - HQMF eMeasures
  - QRDA Category I.

This makes sense, given that standards are a prerequisite for functionality.

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Discussion