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Welcome!
Setting the Standard for EHR-based Quality Reporting

April 27, 2012, 1:30-2:30 PM ET

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Past Chair, HL7 International
Co-Editor, HL7 Clinical Document Architecture
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- 20 years experience with interoperability standards
- Lead author of HL7 CDA, CCD and Using SNOMED CT in HL7 V3
- Past co-chair HITSP Foundations Committee
- Prior member of SNOMED International Editorial Board

Setting the Standard for EHR-based Quality Reporting

Bob Dolin, MD, FACP
Past Chair, Health Level Seven
President and CMO, Lantana Consulting Group
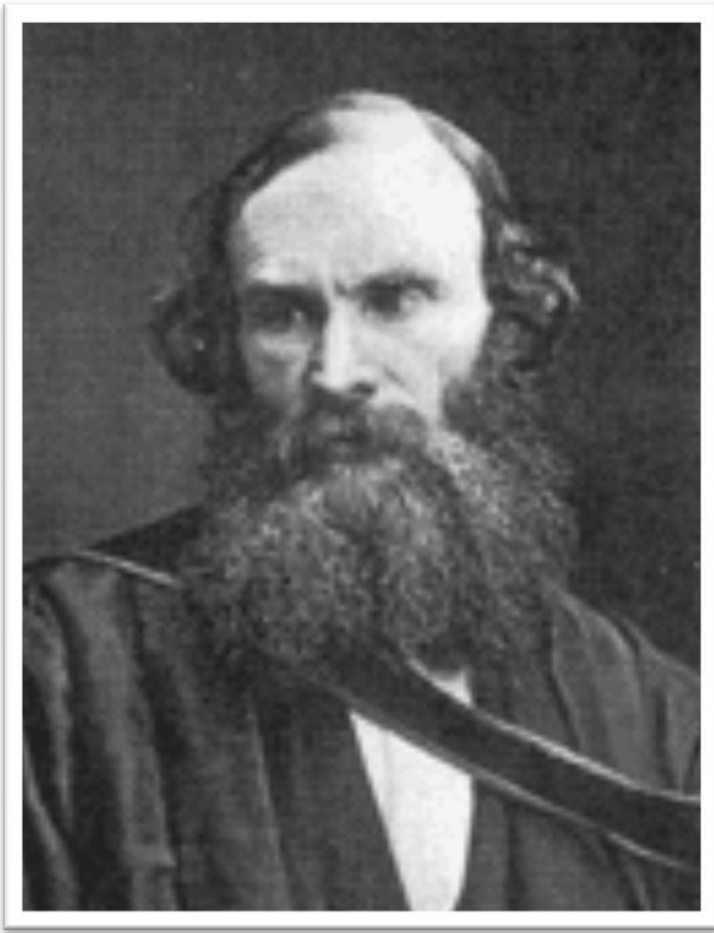
Outline

Introduction

Quality reporting standards

Putting it all together

INTRODUCTION

Standards are a Prerequisite to Functionality

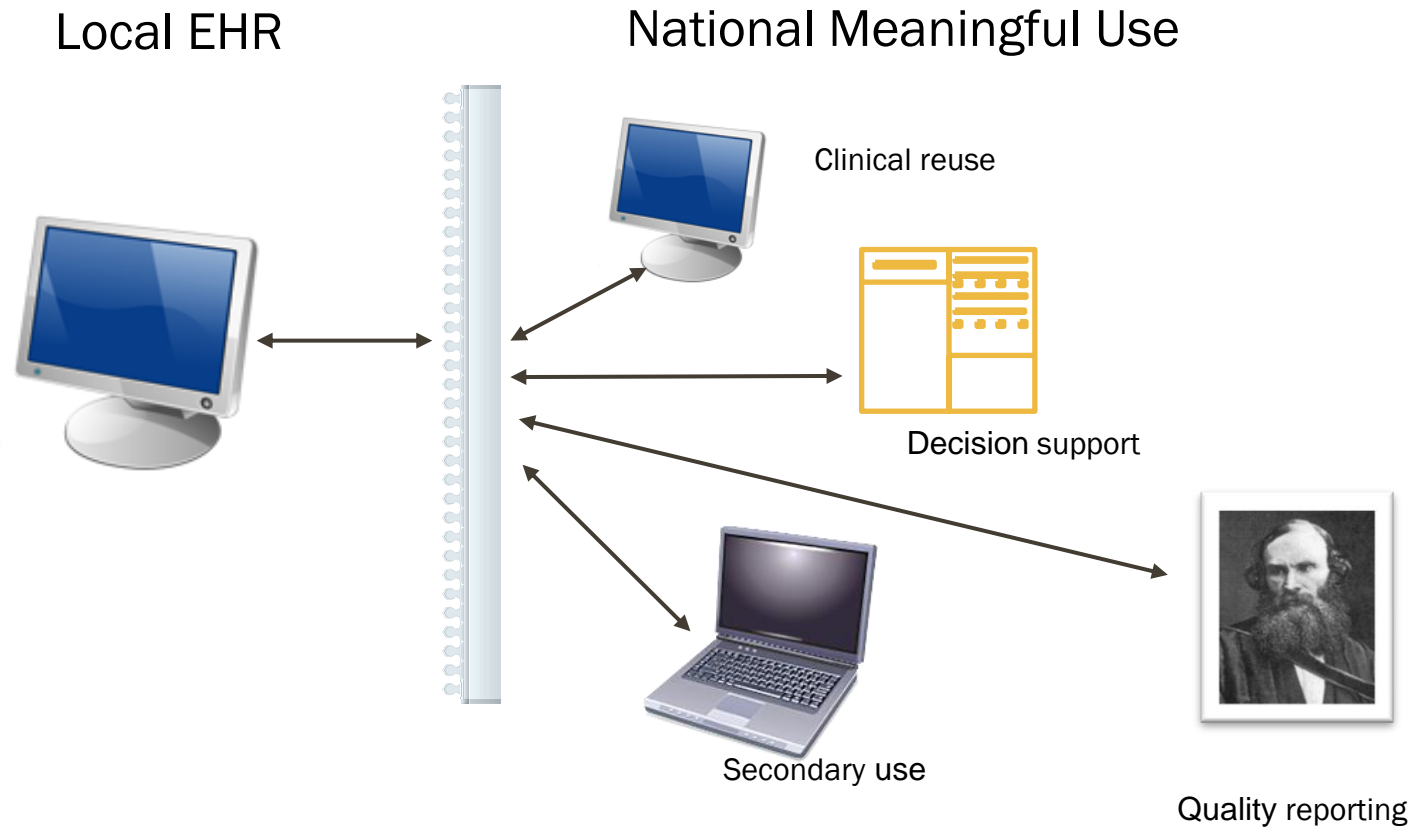*"If you cannot measure it, you cannot improve it."*

Lord Kelvin (1824-1907)

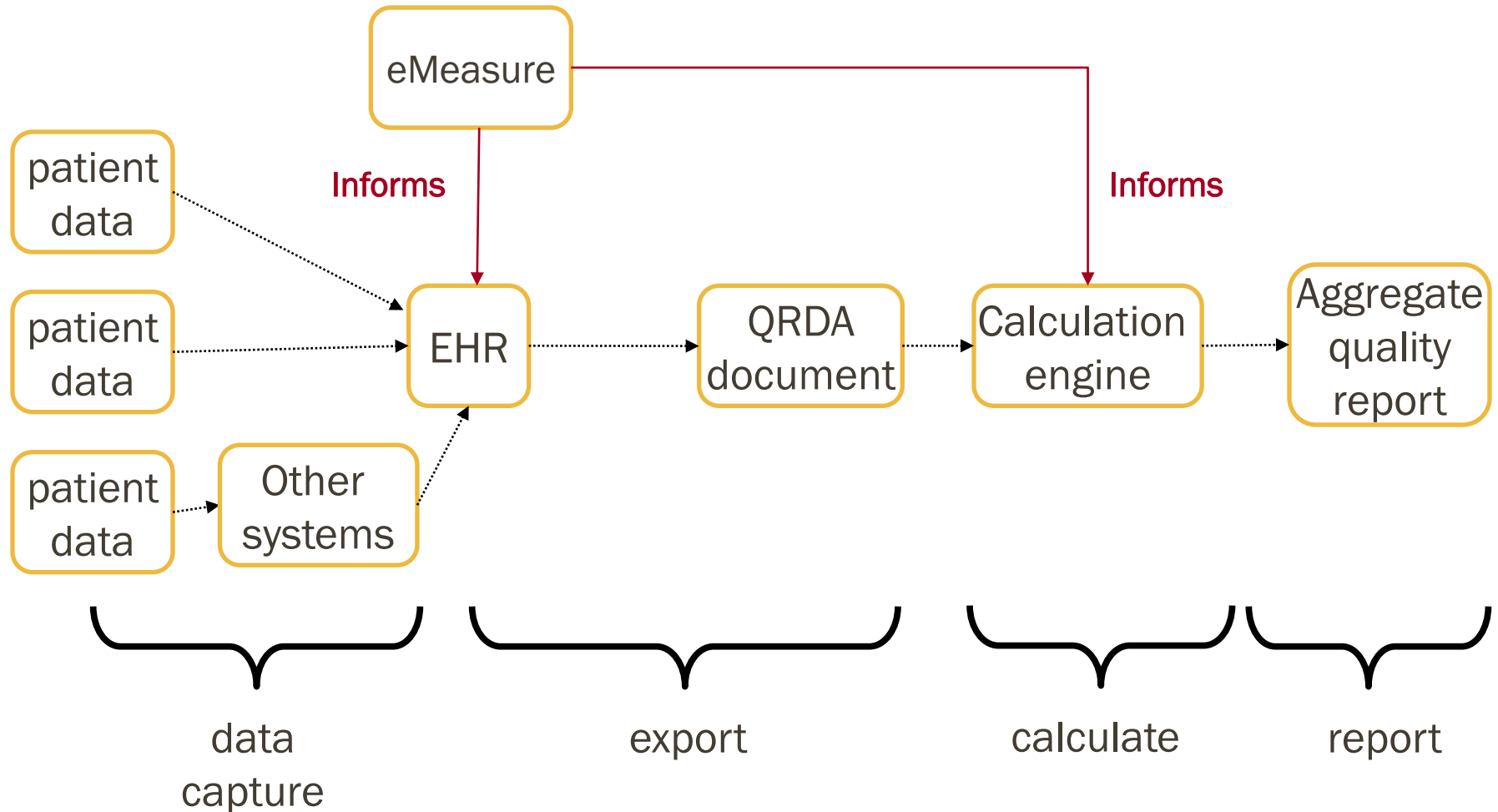*"If you cannot standardize it, you cannot measure it."*

Bob Dolin (2011)

Big Picture View

Local EHR

National Meaningful Use

Clinical reuse

Decision support

Secondary use

Quality reporting

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MU2 and Quality Reporting: One Approach

eMeasure

Informs

Informs

patient data

patient data

patient data

EHR

Other systems

QRDA document

Calculation engine

Aggregate quality report

data capture

export

calculate

report

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QUALITY REPORTING STANDARDS

Health Level Seven International (HL7)

- Clinical Document Architecture (CDA)
    - Continuity of Care Document (CCD)
    - Consolidated CDA
    - Quality Reporting Document Architecture (QRDA)
- Healthcare Quality Measure Format (eMeasure)

National Quality Forum (NQF)

- Quality Data Model (QDM)

Meaningful Use and Health Level Seven

Key standards include:

- **HL7 Lab, Immunization Messages**

- **HL7 Clinical Document Architecture** **(CDA)**
  Standardized representation of clinical documents

- **HL7 Continuity of Care Document** **(CCD)**
  A CDA-based representation of summary documents

- **HL7 Consolidated CDA Implementation Guide** (MU Stage 2)
  A CDA-based representation of common clinical documents (Consultation Note, H&P, Progress Note, Discharge Summary, Operative Note, Procedure Note, Diagnostic Imaging Report)

- **HL7 Quality Reporting Document Architecture** (MU Stage 2)
  A CDA-based representation of patient-level clinical quality data

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Why is CDA so Popular??

1. Get the data flowing, get the data flowing, get the data flowing

2. Incrementally add structure, where valuable to do so

Quality Reporting

Decision Support

Clinical Applications

Meaningful Use!

Narrative Text

HL7 CDA Structured Documents

Coded Discrete Data Elements

SNOMED CT

Disease, DF-00000

Metabolic Disease, D6-00000

Disorder of carbohydrate metabolism, D6-50000

Disorder of glucose metabolism, D6-50100

Diabetes Mellitus, DB-61000

Type 1, DB-61010

Neonatal, DB75110

Carpenter Syndrome, DB-02324

Insulin dependant type IA, DB-61020

Templated CDA

- Many different kinds of documents
- A bucket of reusable templates
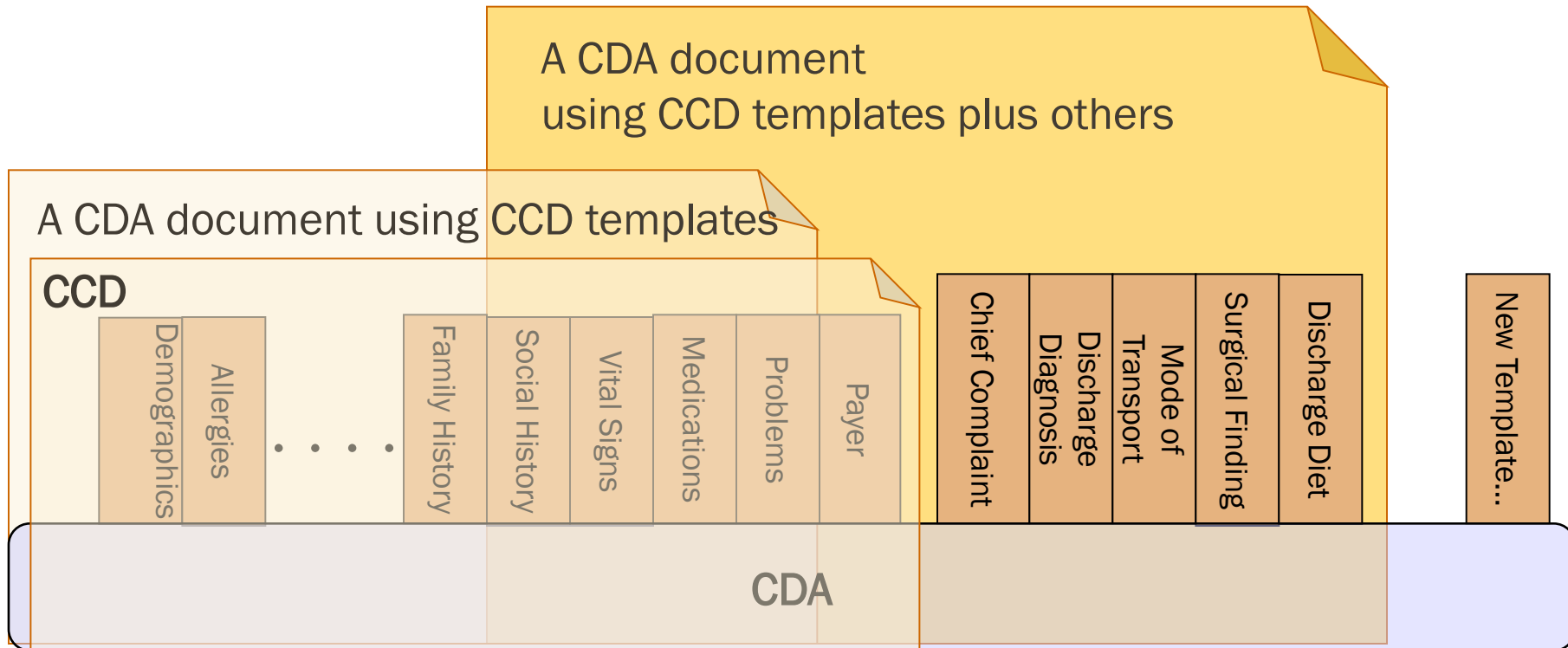
Consolidated CDA

- Many different kinds of documents:
  - CCD
  - Consultation Note
  - Diagnostic Imaging Report
  - Discharge Summary
  - H&P
  - Operative Note
  - Procedure Note
  - Progress Note
  - Unstructured Document
- A bucket of reusable templates
- www.hl7.org

CDAR2_IG_IHE_CONSOL_R1_DSTU_2011DEC

**HL7 Implementation Guide for CDA® Release 2:
IHE Health Story Consolidation, Release 1**

(US Realm)

**DRAFT STANDARD FOR TRIAL USE
December 2011**

Publication of this draft standard for trial use and comment has been approved by Health Level Seven, Inc. (HL7). Distribution of this draft standard for comment shall not continue beyond 24 months from the date of publication. It is expected that following this 24 month period, this draft standard, revised as necessary, will be submitted to a normative ballot in preparation for approval by ANSI as an American National Standard. This draft standard is not an accredited American National Standard. Suggestions for revision should be submitted at http://www.hl7.org/dstucomments/index.cfm.

Produced in collaboration with:

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MU2 and Quality Reporting: One Approach

eMeasure

patient data

patient data

patient data

Other systems

Informs

EHR

QRDA document

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data capture

export

calculate

report

NQF QDM

QRDA

HQMF eMeasure

TBD

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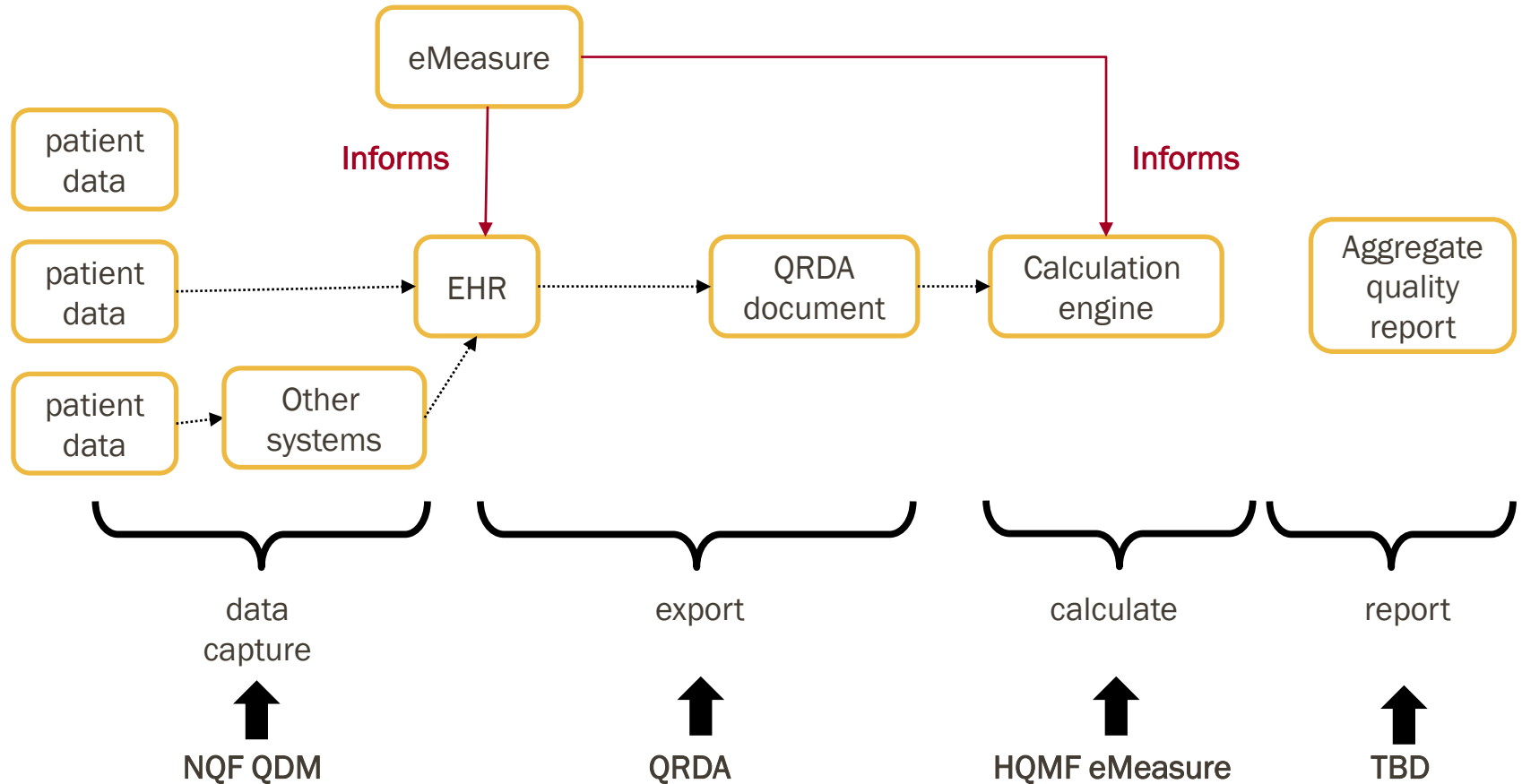
Data Capture – NQF Quality Data Model

- National Quality Forum QDM is a "Domain Analysis Model"
- HL7 has implemented QDM in eMeasure and QRDA
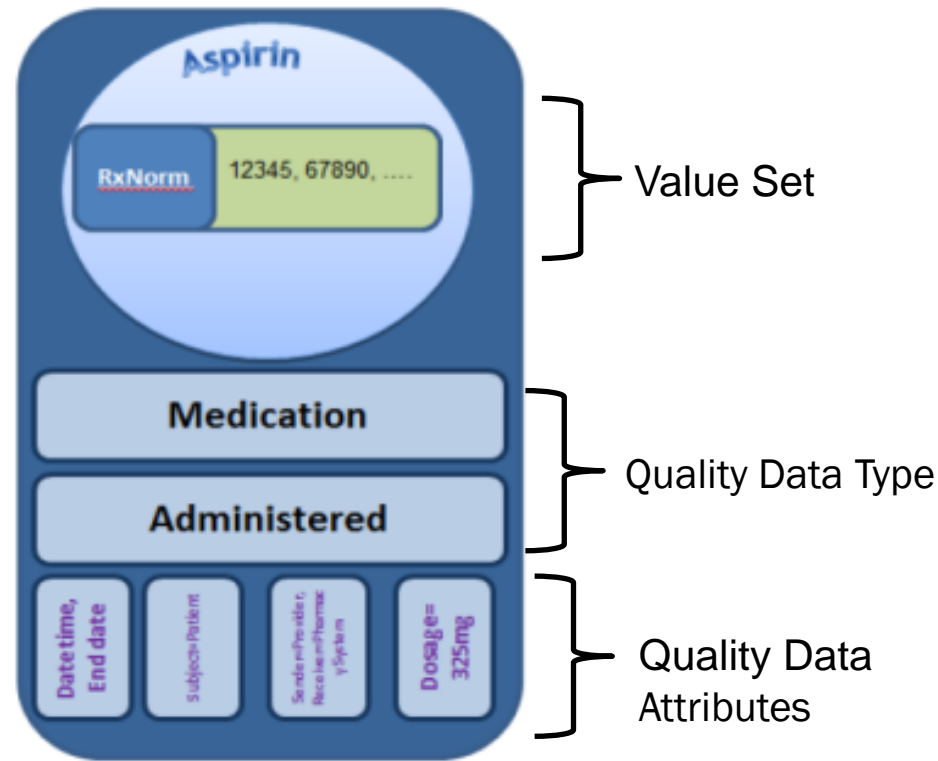
Export

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."

Export – 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

patient data → EHR → CCD document → Calculation engine → Aggregate quality report

EHR ⤍ QRDA document ⤍ Calculation engine

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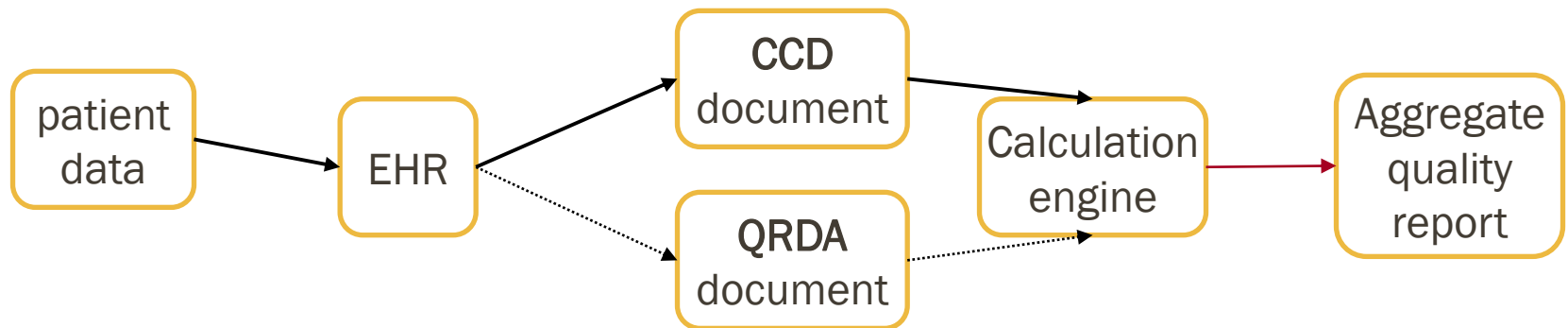
Export – HL7 Quality Reporting Document Architecture (QRDA)

QRDA is another CDA-based Implementation Guide that is designed so as to have those data elements needed for quality measurement

A QRDA document
using CCD templates plus others

A CDA document using CCD templates

CCD

Demographics · Allergies · · · · · Family History · Social History · Vital Signs · Medications · Problems · Payer · Chief Complaint · Discharge Diagnosis · Mode of Transport · Surgical Finding · Discharge Diet · New Template...

CDA

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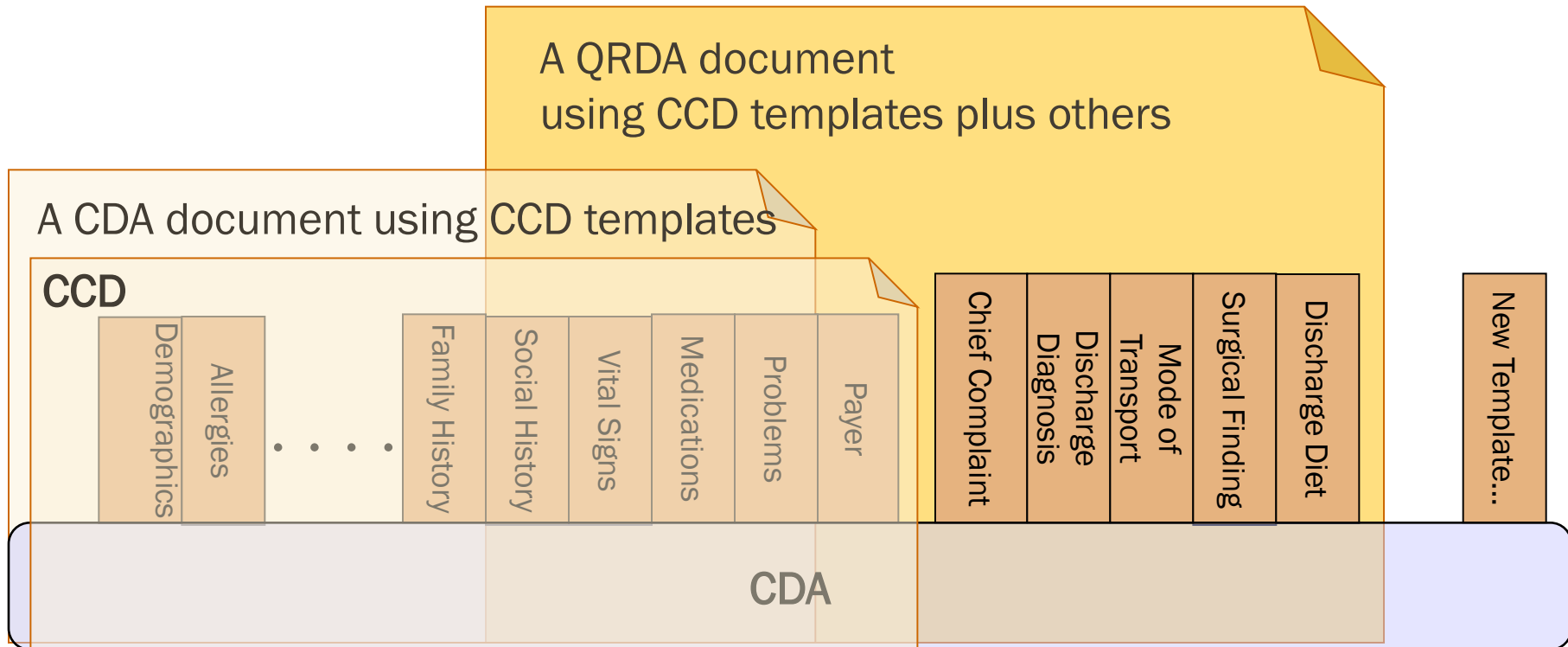
Export - Simplification

- QDM-based eMeasure and QDM-based QRDA

- **green**QRDA

- Tooling Support
  - eSpecification Navigator
  - HQMF Processing Engine / QRDA Instance Generator

```
                                    eMeasure ──────────────────┐
                                                               │
patient                      Informs │                  Informs │
data                                 ▼                          ▼
patient                            EHR ····▶ QRDA ·····▶ Calculation   Aggregate
data ·········▶                            document      engine        quality
                                                                       report
patient ····▶ Other
data          systems ····▶

    └─────┬─────┘   └────────┬────────┘   └────┬────┘  └───┬───┘
       data              export           calculate    report
      capture
```

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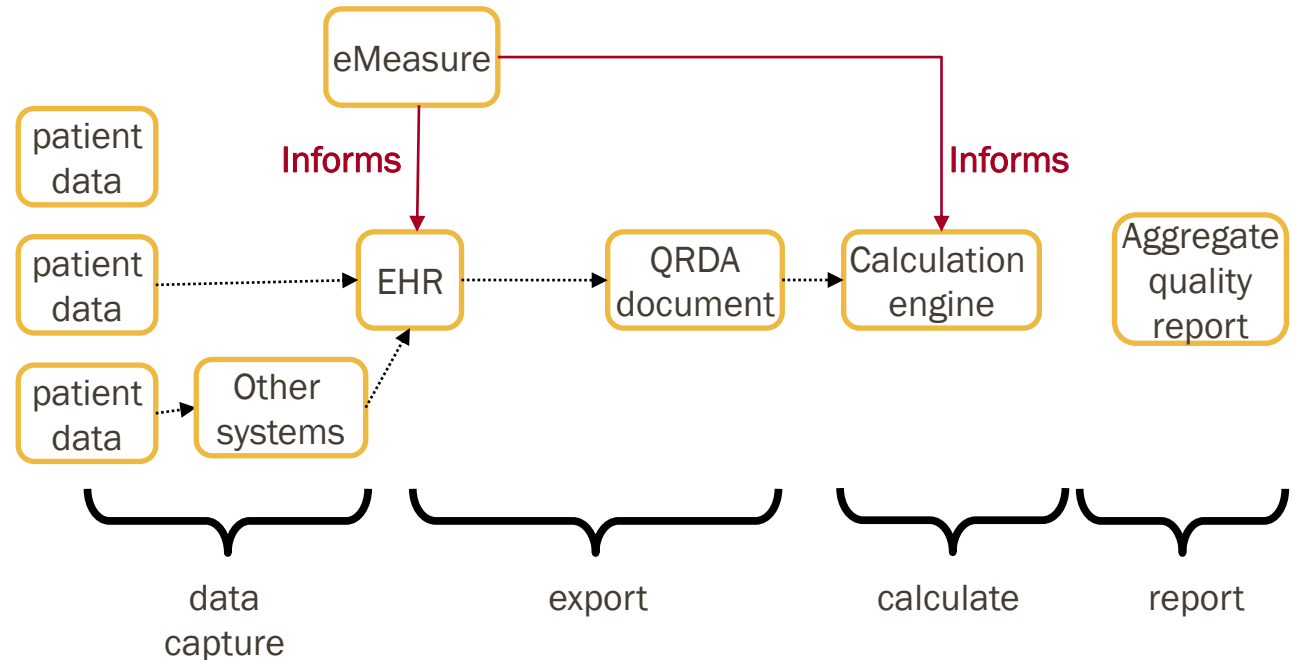
greenQRDA - Build the **Green** Module

Requirements

CDA Data Location	HITSP Data Element Identifier and Name
cda:observation[cda:templateId/@root = '2.16.840.1.113883.10.20.1.31']	Result Event Entry
cda:id	15.01 - Result ID
cda:effectiveTime	15.02 - Result Date/Time
cda:code/@code	15.03 - Result Type
cda:statusCode	15.04 - Result Status
cda:value	15.05 - Result Value
cda:interpretationCode/@code	15.06 - Result Interpretation
cda:referenceRange	15.07 - Result Reference Range

greenQRDA schema

```
<result>
   <resultID>
   <resultDateTime>
   <resultType>
   <resultStatus>
   <resultValue>
   <resultInterpretation>
   <resultReferenceRange>
</result>
```

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greenQRDA – Create a Conformant Instance

greenQRDA instance

```
<result>
    <resultID>
    <resultDateTime>
    <resultType>
    <resultStatus>
    <resultValu
    <resultInte
    <resultRefe
</result>
```

Conformant QRDA instance

```
<!-- These examples assume the default namespace is 'urn:hl7-org:v3' -->
<observation classCode='OBS' moodCode='EVN'>
    <templateId root='2.16.840.1.113883.10.20.1.31'/>
    <templateId root='2.16.840.1.113883.3.88.11.83.15'/>
    <templateId root='1.3.6.1.4.1.19376.1.5.3.1.4.13'/>
    <code code='...' displayName='...' codeSystem='2.16.840.1.113883.6.1'
codeSystemName='LOINC'/>
    <effectiveTime low value='...'/>
    <statusCode value='N'/>
    <value xsi:type="PQ" value="100" unit="g/dl"/>
    <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"/>
    <referenceRange>
        <observationRange>
            <text>M 13-18 g/dl; F 12-16 g/dl</text>
        </observationRange>
    </referenceRange>
</observation>
```

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What Data Elements are Relevant for Given Measures?

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

What Data Elements are Relevant for Given Measures?

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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Calculate – Health Quality Measure Format (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

- eMeasure: a quality measure encoded in HQMF format

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HQMF (eMeasure)

HQMF: The first international standard for the formal representation of clinical quality measure **metadata**, **data elements**, and **logic**

```
<QualityMeasureDocument>

    HQMF Header


    HQMF Body
     <section>
       <title>Population criteria</title>
       <text>
       <entry>Initial Patient Population</entry>
       <entry>Denominator</entry>
       <entry>Numerator</entry>
       …
     </section>
     <section>
       <title>Data criteria</title>
       <text>
       <entry>
       …
     </section>
        …
</QualityMeasureDocument>
```

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eMeasure and QRDA: STK-3

Percentage of inpatients diagnosed with ischemic stroke who were prescribed anticoagulation at discharge

eMeasure (criteria)

- DENOM
  - Discharge diagnosis of ischemic stroke
  - Age >= 18
  - Hx of Afib/Aflutter
- NUMER
  - Anticoagulation prescribed at discharge

QRDA (patient data)

- Age
- Encounter type
- Encounter admit date
- Encounter d/c diagnoses
- Problem list
- Discharge medications

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eMeasure

Data criteria are the building blocks for population criteria

Data Criteria

- Discharge diagnosis: Ischemic stroke
- Hx of: Afib/Aflutter
- Discharge medication: Anticoagulant

Population Criteria

- DENOM
    - **AND:** Discharge diagnosis: Ischemic stroke
    - **AND:** Hx of: Afib/Aflutter
- NUM
    - **AND:** Discharge medication: Anticoagulant

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eMeasure

Data criteria are built from the National Quality Forum Quality Data Model

| HITEP Quality Data Element	Code List
Discharge diagnosis	Ischemic stroke code list
History of	Afib/Aflutter code list
Discharge medication	Anticoagulant code list

Data Criteria
- Discharge diagnosis: Ischemic stroke
- Hx of: Afib/Aflutter
- Discharge medication: Anticoagulant

Population Criteria
- DENOM
  - **AND**: Discharge diagnosis: Ischemic stroke
  - **AND**: Hx of: Afib/Aflutter
- NUM
  - **AND**: Discharge medication: Anticoagulant

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PUTTING IT ALL TOGETHER

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Integrated, End-to-End Standards
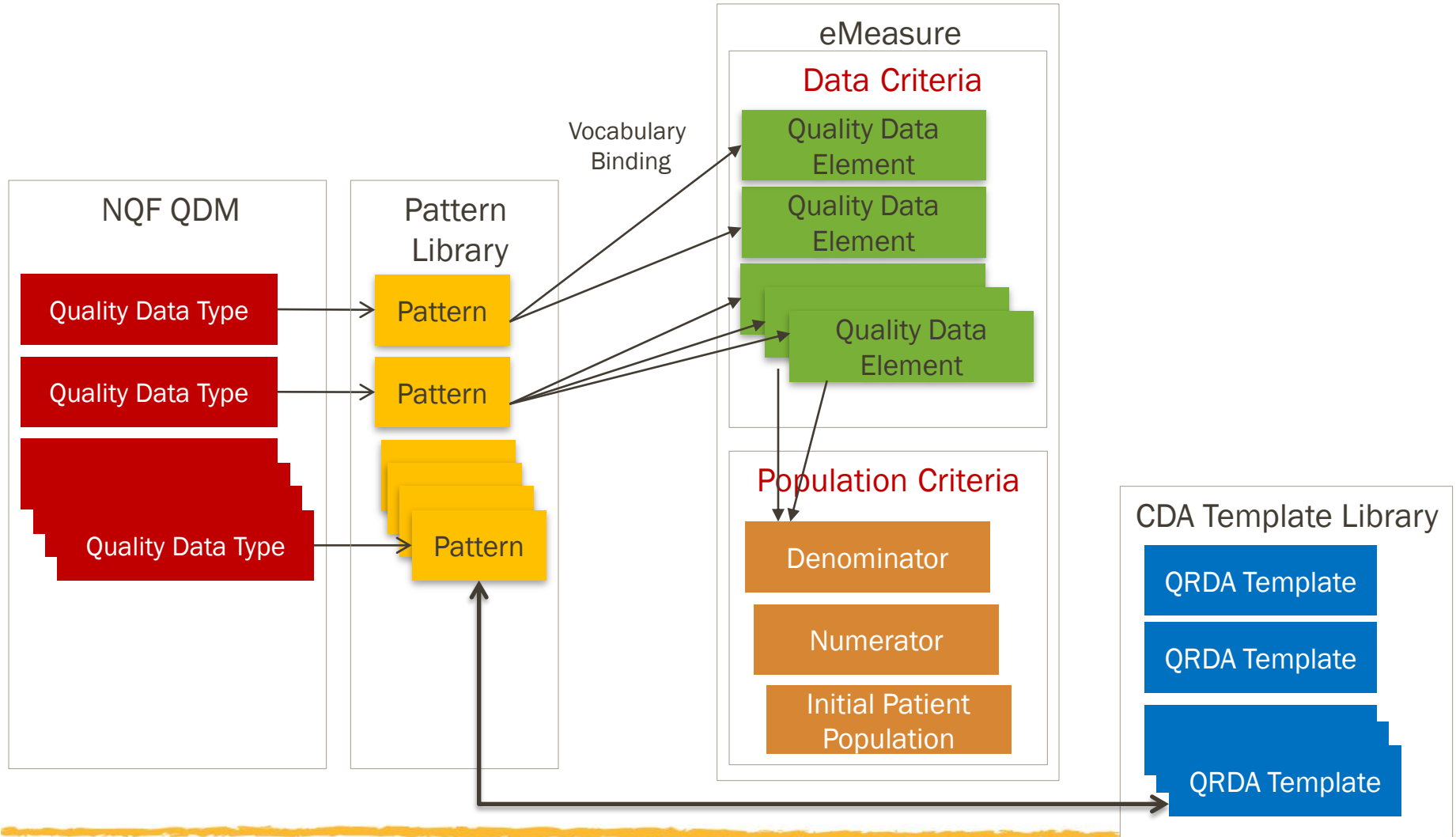
In Closing…

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:

1. A convergence of data elements to streamline data capture
2. Resolution of conflicting and ambiguous requirements
3. Getting past inconsistencies and discrepancies in various regulatory requirements
4. 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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Standards Adoption Strategy

This is what you want...

DATA CAPTURE → **EXPORT** → **ANALYZE**

This is a path to get you there...

DRIVE EHR FUNCTIONALITY ← **INTEROPERABILITY STANDARDS** → INFLUENCE DATABASE DESIGN

Thank You

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Questions and Comments

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