

*Lantana*

CONSULTING GROUP

# End to End Quality Reporting from Electronic Health Records

**Fall AMIA, 2012  
Tutorial T07**

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# Outline

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Introduction

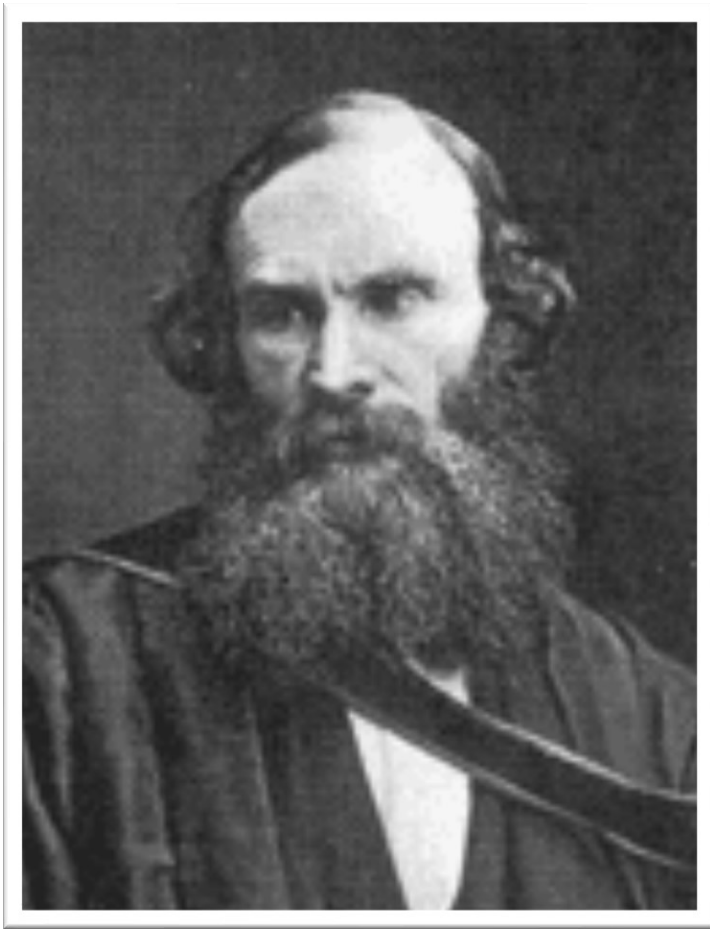
Quality reporting standards

Putting it all together

# INTRODUCTION

# Standards are a Prerequisite to Functionality

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*“If you cannot measure it,  
you cannot improve it.”*

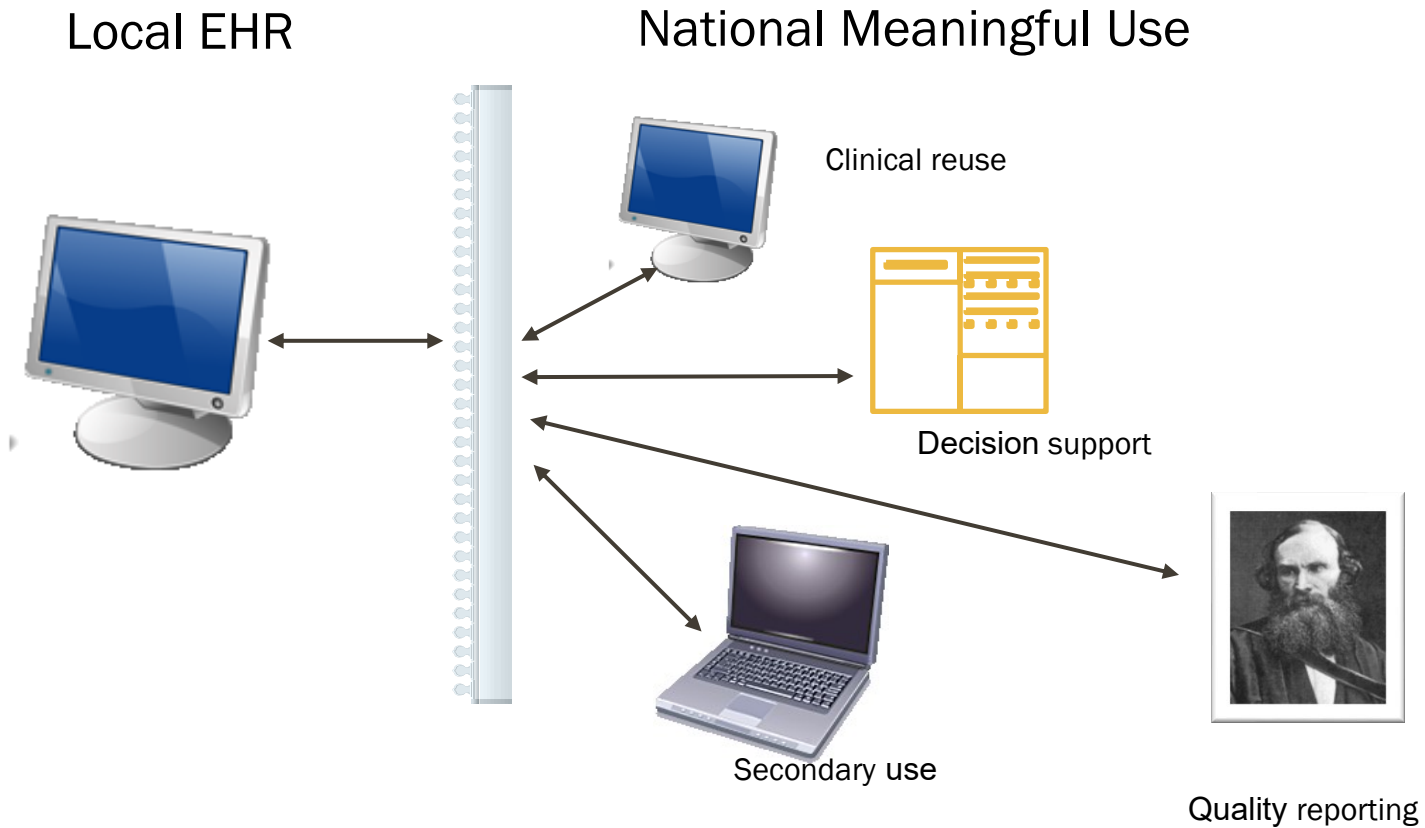
Lord Kelvin (1824-1907)

*“If you cannot standardize  
it, you cannot measure it.”*

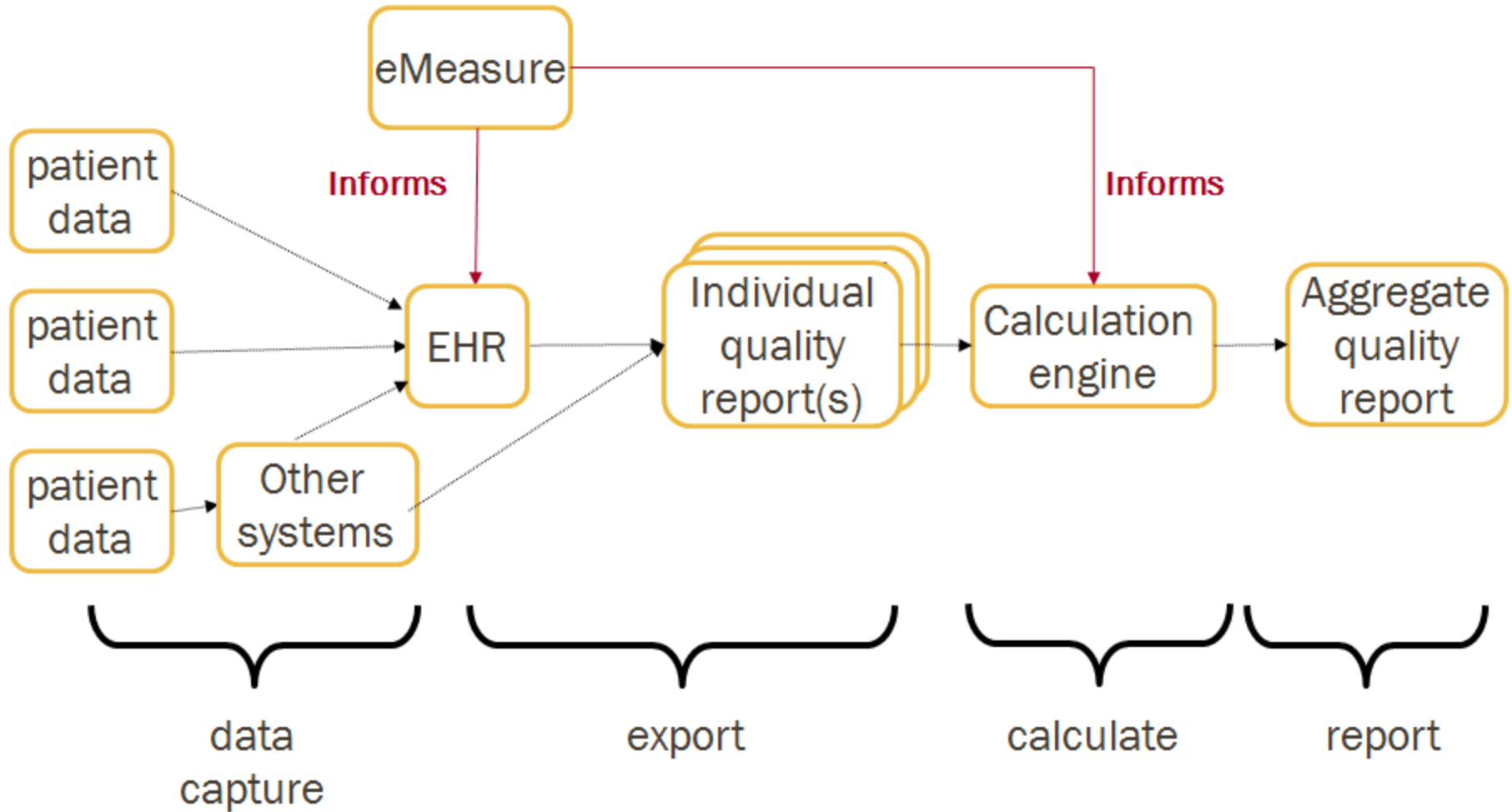


Bob Dolin (2011)

# Big Picture View



# MU2 and Quality Reporting



# QUALITY REPORTING STANDARDS

## Health Level Seven International (HL7)

- Clinical Document Architecture (CDA)
  - 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

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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





# 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

THE MEDQUEST HOSPITAL  
DISCHARGE SUMMARY

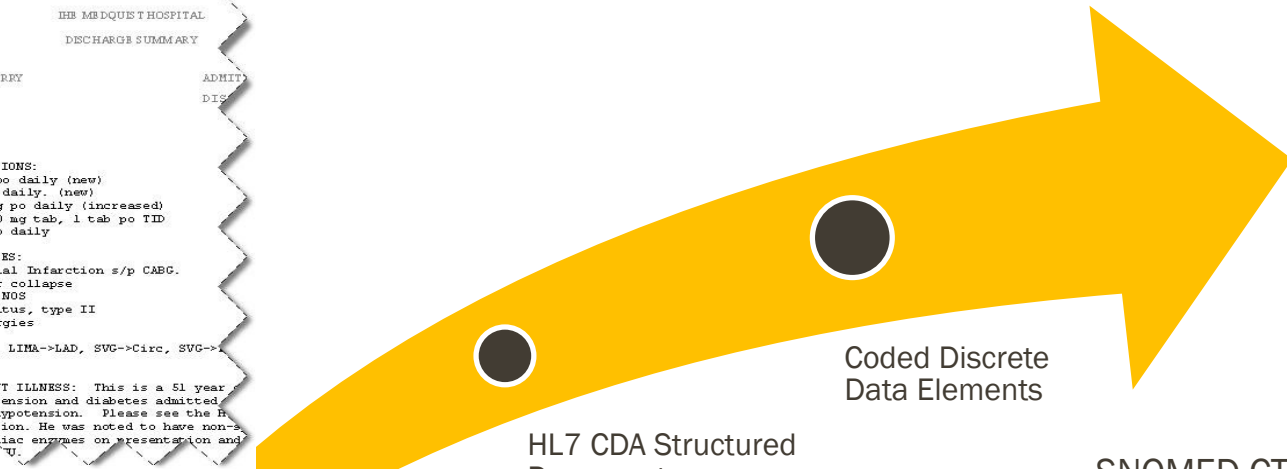
PATIENT: DOGOOD, LARRY ADMITTED:  
MR#: A1234567 DISCHARGE:  
ACCOUNT #: 1234567

DISCHARGE MEDICATIONS:  
1. ECASA 325 mg po daily (new)  
2. Zocor 40mg po daily. (new)  
3. Atenolol 100mg po daily (increased)  
4. Glucophage 850 mg tab, 1 tab po TID  
5. Zyrtec 10mg po daily

DISCHARGE DIAGNOSES:  
1. Acute Myocardial Infarction s/p CABG.  
2. Cardiovascular collapse  
3. Hypertension, NOS  
4. Diabetes Mellitus, type II  
5. Seasonal Allergies

PROCEDURE: CABG, LIHA->LAD, SVG->Circ, SVG->LAD  
2/26/07.

HISTORY OF PRESENT ILLNESS: This is a 51 year old male with a history of Hypertension and diabetes admitted with chest pain, and hypotension. Please see the History of Present Illness for details of admission. He was noted to have non-ST segment elevation and positive cardiac enzymes on presentation and admission to the CCU.



Narrative Text

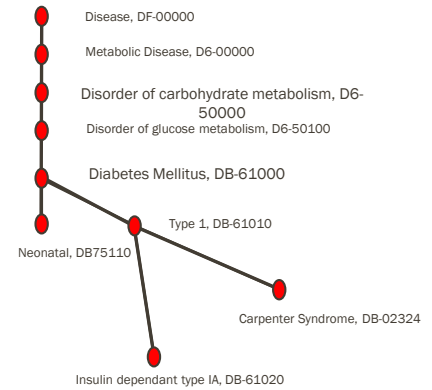
HL7 CDA Structured Documents

Coded Discrete Data Elements

```

<<componentOf>
  <<encapsulatingEncounter classCode="ESNC" moodCode="EVN">
    <id root="1.3.6.4.1.4.1.2835.12" extension="9937012"/>
    <code code="99213" codeSystem="2.16.840.1.113883.6.12" codeSystemName="CPT-4"
      displayName="Evaluation and Management"/>
    <effectiveTime>
      <high value="20070220"/>
      <low value="20070220"/>
    </effectiveTime>
    <dischargeDispositionCode code="01" codeSystem="2.16.840.1.113883.6.21" codeSystemName="UB92"
      displayName="Routine Discharge"/>
    </encapsulatingEncounter>
  </componentOf>
  <<component>
    <<structuredBody>
      <templateId root="1.3.6.1.4.1.11050.10" extension="TMPL_CDAR2_LEVEL1-REF_US_ID_2005SEP"/>
      <<component>
        <<section>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.7" extension="HOSPITAL DISCHARGE DX Template"/>
          <code code="1555-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
            displayName="HOSPITAL DISCHARGE DX"/>
          <code code="DISCHARGE DIAGNOSES" codeSystem="2.16.840.1.113883.6.1" codeSystemName="SNOMED CT"
            displayName="Discharge Diagnoses"/>
          <text>
            <paragraph>1. Acute Myocardial Infarction s/p CABG </paragraph>
            <paragraph>2. Cardiovascular collapse </paragraph>
          </text>
        </section>
      </structuredBody>
    </component>
  </component>
</encapsulatingEncounter>
  
```

SNOMED CT



Quality Reporting

Decision Support

Clinical Applications

Meaningful Use!

# Templated CDA

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

A CDA document  
using CCD templates plus others

A CDA document using CCD templates

CCD

Chief Complaint

Discharge  
Diagnosis

Mode of  
Transport

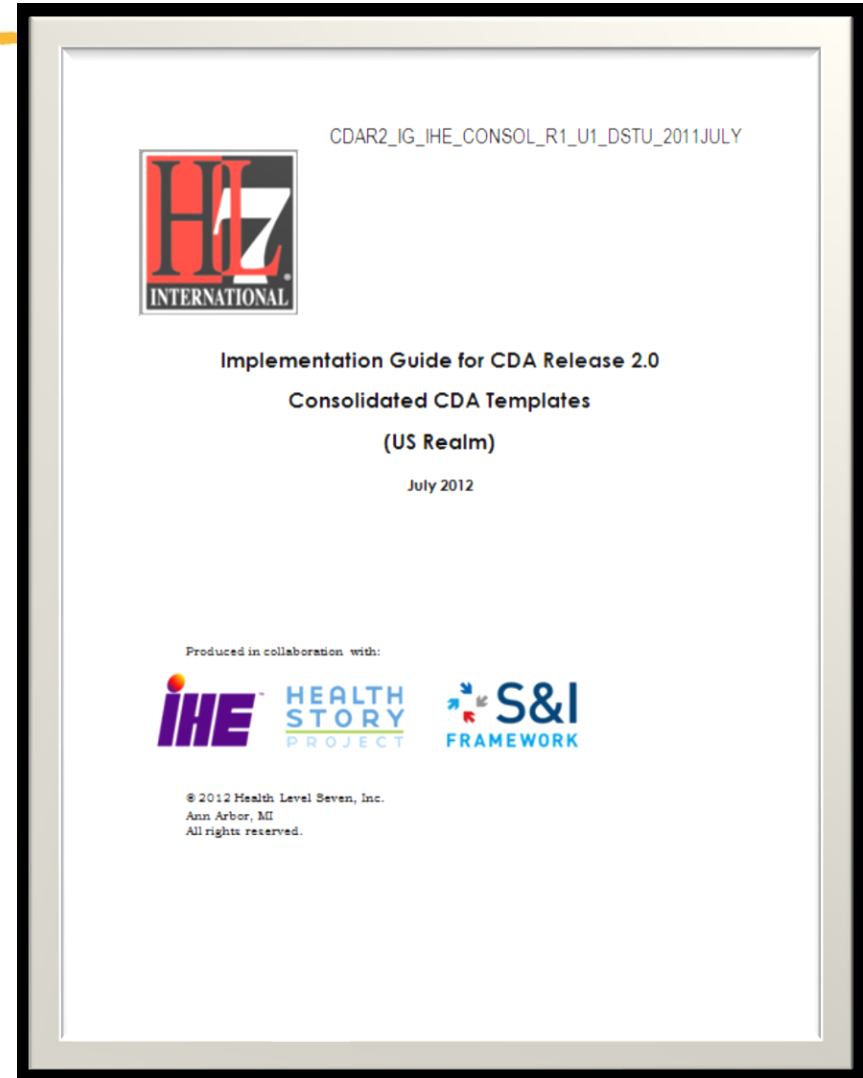
Surgical Finding

Discharge Diet

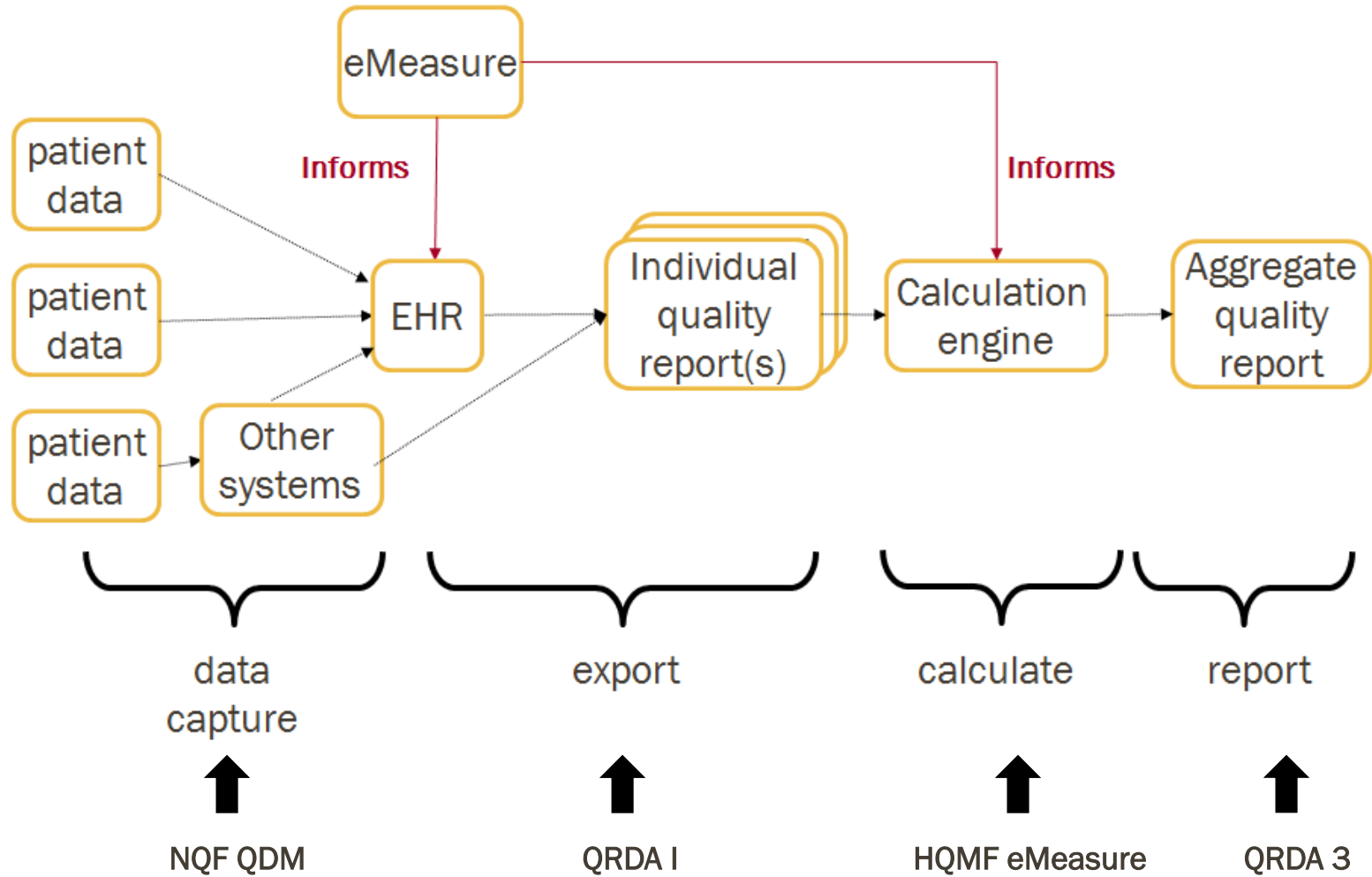
New Template...

# 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](http://www.hl7.org)

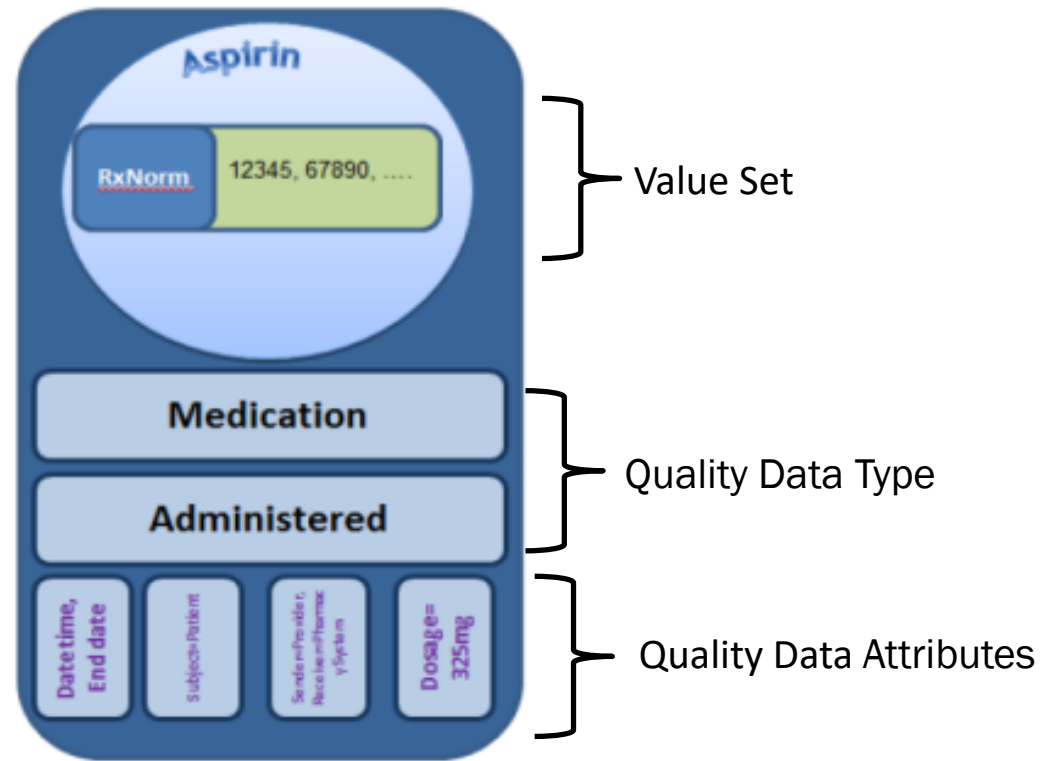


# MU2 and Quality Reporting



# Data Capture – NQF Quality Data Model

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



# Export

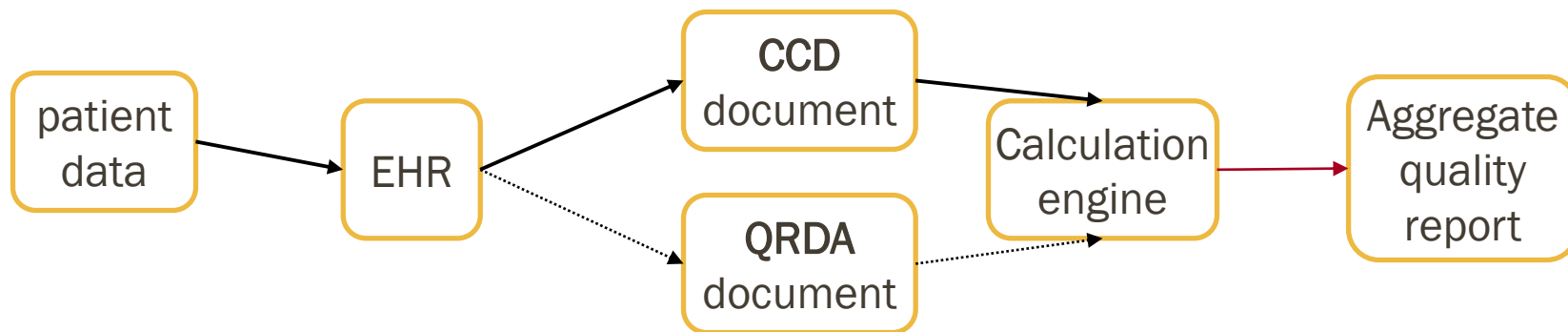
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## MU2 NPRM:

*“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
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



# 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

Chief Complaint

Discharge  
Diagnosis

Mode of  
Transport

Surgical Finding

Discharge Diet

New Template...



# Calculate – Health Quality Measure Format (eMeasure)

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- 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

# 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 Popl</entry>
```

```
        <entry>Denominator</entry>
```

```
        <entry>Numerator</entry>
```

```
      ...
```

```
    </section>
```

```
    <section>
```

```
      <title>Data criteria</title>
```

```
      <text>
```

```
        <entry>
```

```
      ...
```

```
    </section>
```

```
  ...
```

```
</QualityMeasureDocument>
```

# eMeasure and QRDA-1: STK-3

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

## eMeasure (criteria)

- DENOM
  - Discharge diagnosis of ischemic stroke
  - Age  $\geq 18$
  - Hx of Afib/Aflutter
- NUMER
  - Anticoagulation prescribed at discharge

## QRDA-1 (patient data)

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

# 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

# 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

# Report – QRDA Category III

## 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
- Reuses CCD modules where possible

### QRDA Category II – Patient List Report

Not yet officially balloted

### QRDA Category III – Calculated Report

DSTU



# Sample QRDA Category III Report

	1a2b3c (ONC)
Legal authenticator	signed at August 11, 2012
Document maintained by	Good Health Hospital

## Table of Contents

- [Reporting Parameters](#)
- [QRDA Category III Measure Section](#)

## Reporting Parameters

- Reporting period: 01 January 2012 - 31 March 2012
- First encounter: 05 January 2012
- Last encounter: 24 March 2012

## QRDA Category III Measure Section

eMeasure Title	Version neutral identifier	eMeasure Version Number	NQF eMeasure Number	eMeasure Identifier (MAT)	Version specific identifier
Anticoagulation Therapy for Atrial Fibrillation/Flutter	03876d69-085b-415c-ae9d-9924171040c2	1	0436	71	8a4d92b2-36af-5758-0136-ea8c43244986

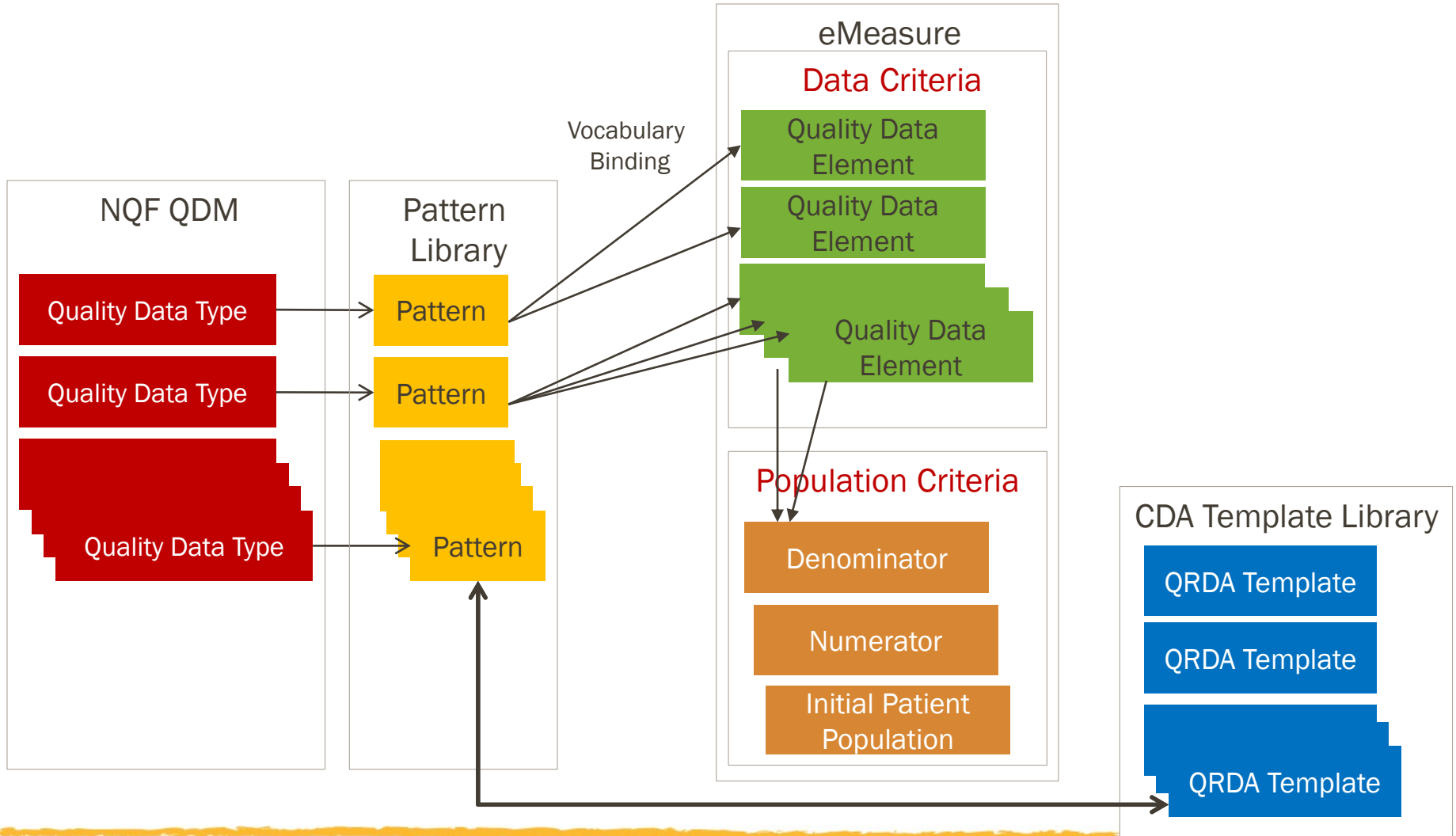
Member of Measure Set: Clinical Quality Measure Set 2011-2012 - b6ac13e2-beb8-4e4f-94ed-fcc397406cd8

- **Performance Rate:** 83% (Predicted = 62%)
- **Reporting Rate:** 84%
- **Initial Patient Population:** 1000
  - Male: 400
  - Female: 600
  - Not Hispanic or Latino: 350
  - Hispanic or Latino: 650
  - Black: 300
  - White: 350
  - Asian: 350
  - Payer - Medicare: 250
  - Payer - Medicaid: 550
  - Zipcode 92543: 15
- **Denominator:** 500
  - Male: 200
  - Female: 300
  - Not Hispanic or Latino: 175
  - Hispanic or Latino: 325
  - Black: 150
  - White: 175

# PUTTING IT ALL TOGETHER



# Integrated, End-to-End Standards



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# Thank You