The Office of the National Coordinator for
**Health Information Technology**

# Taking the Next Step with Electronic Quality Measures (eCQM 102) for Quality Reporting Programs

*How to Implement Quality Measure Updates*
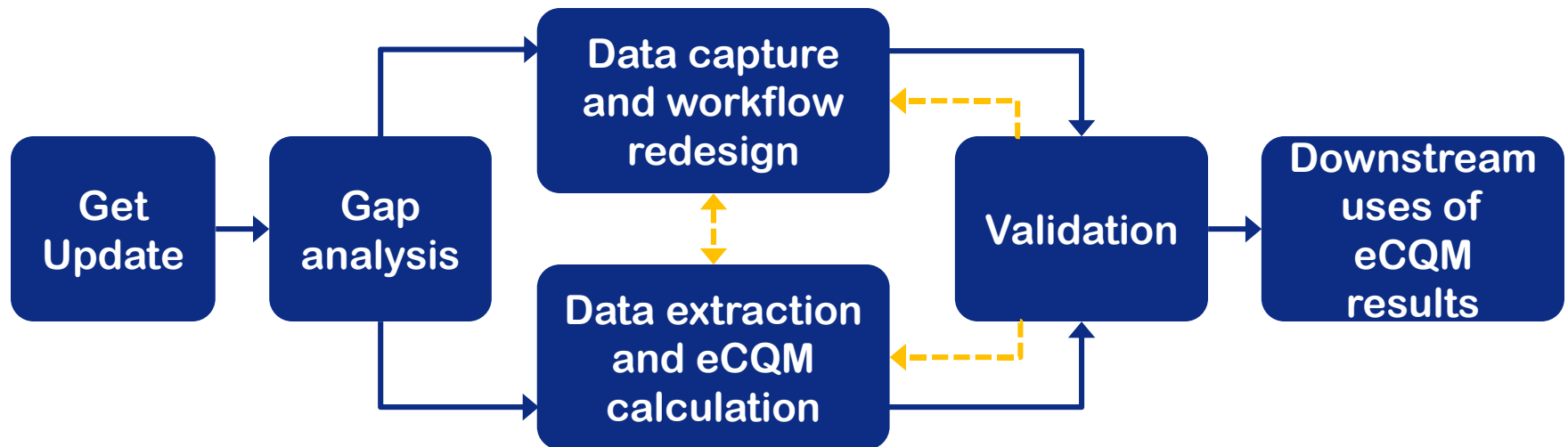
June 4, 2015

HealthIT.gov

- Group of implementers, vendors, developers/contractors, and federal staff who volunteered during or after December 2014 CMS eCQM LEAN Kaizen event to improve the measure process by:
  - Providing resources, education, and collaboration for implementers of eCQMs in every site, practice setting, location, and size
  - Helping to develop a process to evaluate clinical workflows as the initial step in measure development and to integrate that workflow into the measure
  - Helping to develop a curation process and centralized library for data elements required for capture in quality measure programs
  - Advocating for improved mechanisms for providing and responding to feedback from the measure community
- Presented eCQM 101 webinar ("*Getting Started with Electronic Quality Measures for Quality Reporting Programs*") March 25, 2015
  - PDF presentation: http://www.cms.gov/eHealth/downloads/Webinar_eHealth_March25_eCQM101.pdf
  - Webinar recording (Recording ID: MTMJ9S; Key: eHealth): https://www150.livemeeting.com/cc/8000055450/view?id=MTMJ9S&pw=eHealth

- Determine how to identify changes that could impact an existing quality measure implementation

- Evaluate existing processes for managing workflow when implementing a quality measure

- Understand the changes in measure specifications and standards that are part of the May 2015 eCQM Annual Update
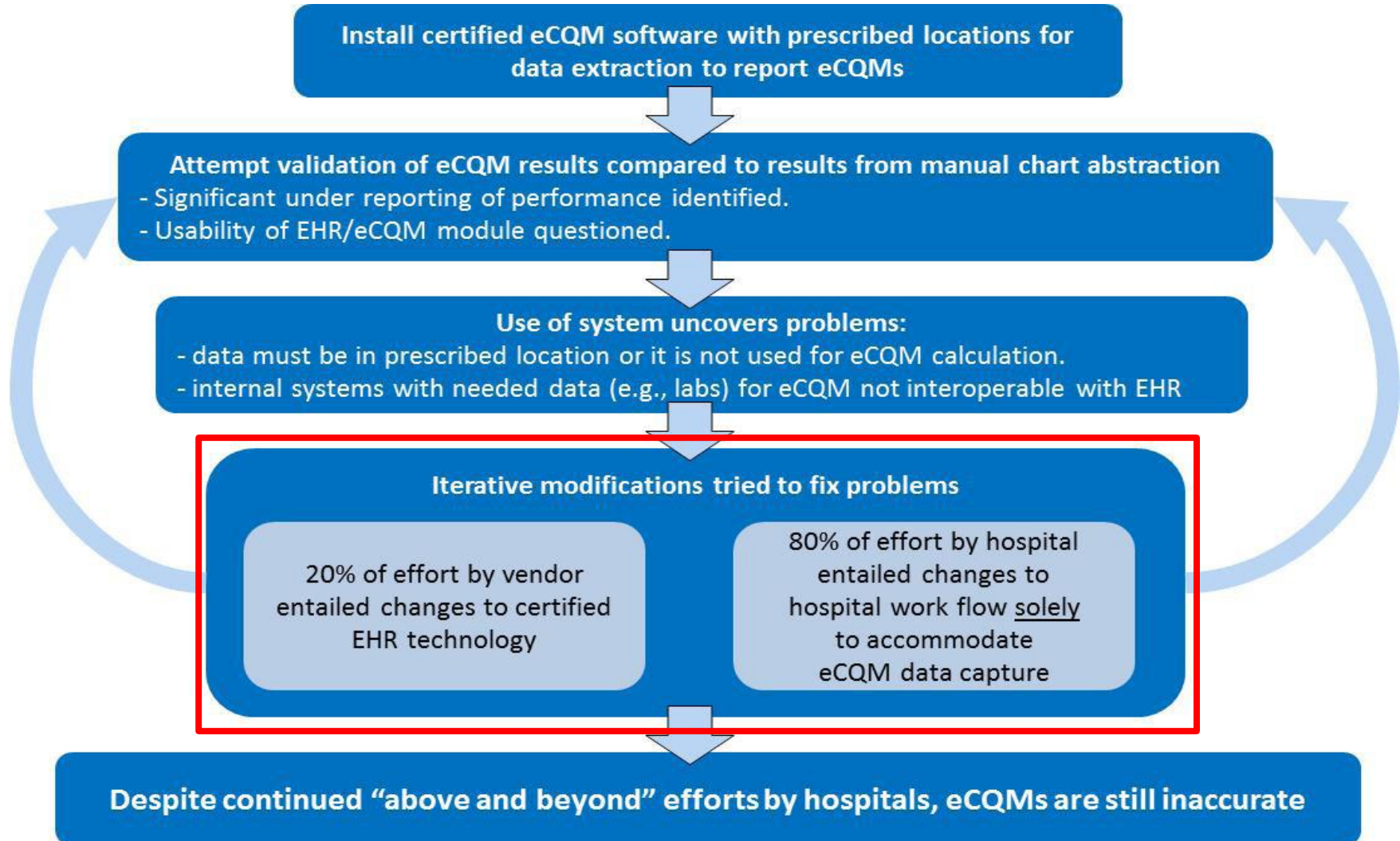
- Overview of process of implementing measure updates
- Planning for the implementation of measure updates
  - Developing a workplan
  - Educational materials and training
- Step-by-step explanation of measure update implementation process
  - Step 1: Get updates
  - Step 2: Gap analysis
  - Step 3: Data capture and workflow redesign
    - Conducting a workflow analysis
  - Step 4: Data extraction and eCQM calculation
  - Step 5: Validation
  - Step 6: Downstream uses of eCQM results
- Overview of measure updates, including the recent 2015 Annual Update

# Overview of Process for Implementing Measure Updates
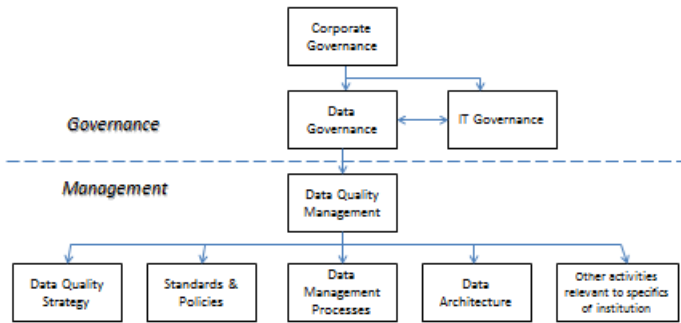
# Overview: eCQM Implementation Process



A Study of the Impact of Meaningful Use Clinical Quality Measures. Eisenberg et al., 2013.
http://www.aha.org/content/13/13ehrchallenges-report.pdf

Install certified eCQM software with prescribed locations for data extraction to report eCQMs

Attempt validation of eCQM results compared to results from manual chart abstraction
- Significant under reporting of performance identified.
- Usability of EHR/eCQM module questioned.

Use of system uncovers problems:
- data must be in prescribed location or it is not used for eCQM calculation.
- internal systems with needed data (e.g., labs) for eCQM not interoperable with EHR

Iterative modifications tried to fix problems

20% of effort by vendor entailed changes to certified EHR technology

80% of effort by hospital entailed changes to hospital work flow solely to accommodate eCQM data capture

Despite continued "above and beyond" efforts by hospitals, eCQMs are still inaccurate

A Study of the Impact of Meaningful Use Clinical Quality Measures. Eisenberg et al., 2013.
http://www.aha.org/content/13/13ehrchallenges-report.pdf

## Data Governance Model



Governance

- Corporate Governance
- Data Governance
- IT Governance

Management

- Data Quality Management
  - Data Quality Strategy
  - Standards & Policies
  - Data Management Processes
  - Data Architecture
  - Other activities relevant to specifics of institution

Certified Health IT Product List
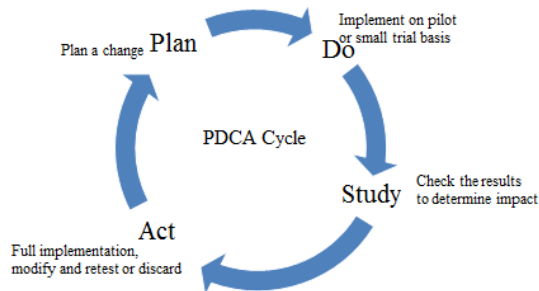The Office of the National Coordinator for Health Information Technology

**Health IT/Data Governance**

**Successful eCQMs**

**Quality**

**Team Effort**

## Plan-Do-Study-Act Cycle



Plan a change — **Plan**

**Do** — Implement on pilot or small trial basis

PDCA Cycle

**Study** — Check the results to determine impact

**Act** — Full implementation, modify and retest or discard

**The Practice Facilitation Handbook**

Training Modules for New Facilitators and Their Trainers

http://www.ahrq.gov/professionals/prevention-chronic-care/improve/system/pfhandbook/

# Planning for the Implementation of Measure Updates

# Creating a Workplan



- Create a very detailed work plan for your organization

- Consult workplan as your organization implements measures and works to attain stages of Meaningful Use

- To create the workplan:

  - Back into the timing needed to report eCQMs by January 2016

  - Include key implementation steps (outlined in this and the March 25 presentation)

  - Assign key roles and responsibilities, including data governance/data integrity checks and balances

- What is the measure domain?
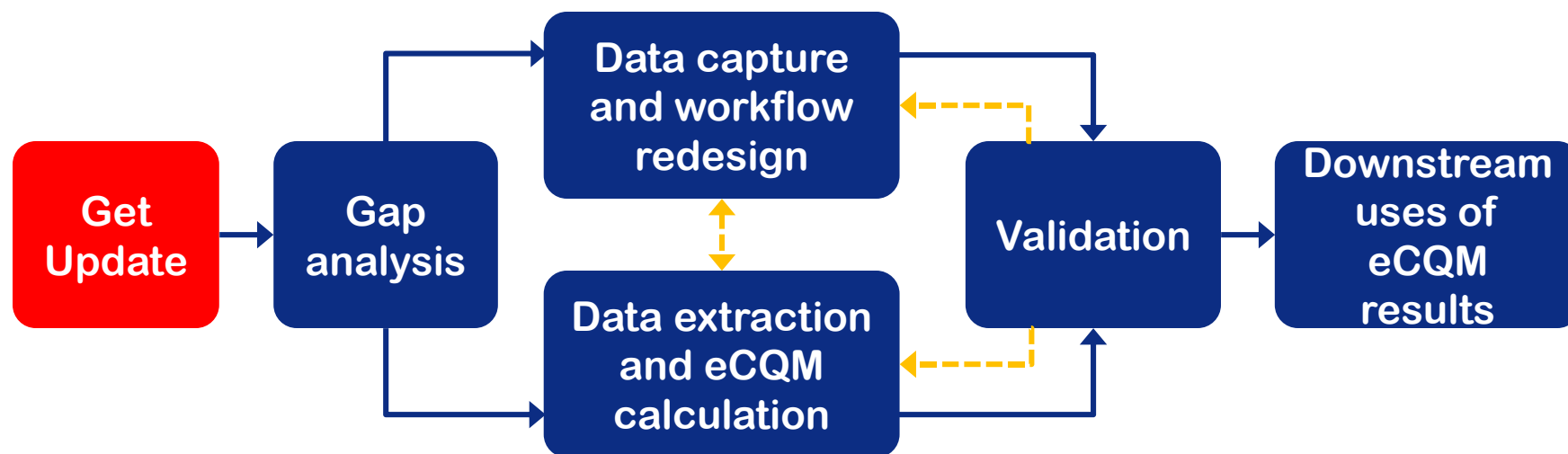- What other quality reporting programs use the measure?
  - Does the measure meet both EHR Incentive Program and Hospital IQR Program requirements?
- Is the vendor 2014 Certified for the measure?
- Does the vendor's recommended workflow align with your organization's existing workflow?
  - If not, perform an impact analysis to determine the feasibility of implementing the new recommended workflow.

# Key Steps in Workplan

- Select eCQMs
- Map data elements according to eCQM specifications for each measure (this is a significant effort)
- Prepare Non-Production and Production QRDA Environments
- Configure QRDA Reporting
- Determine where QRDA output files will be stored
- Implement QRDA in Non-Production Environment
- Perform testing
- Perform validation
- Perform training
- Implement QRDA in Production Environment
- Generate QRDA files
- Submit QRDA files

Tool set

Capitalize on all educational resources (*vendor, federal, and other*)

Educate the team *(workplan, roles, and responsibilities)*

National Quality Strategy: Emphasizing the Context
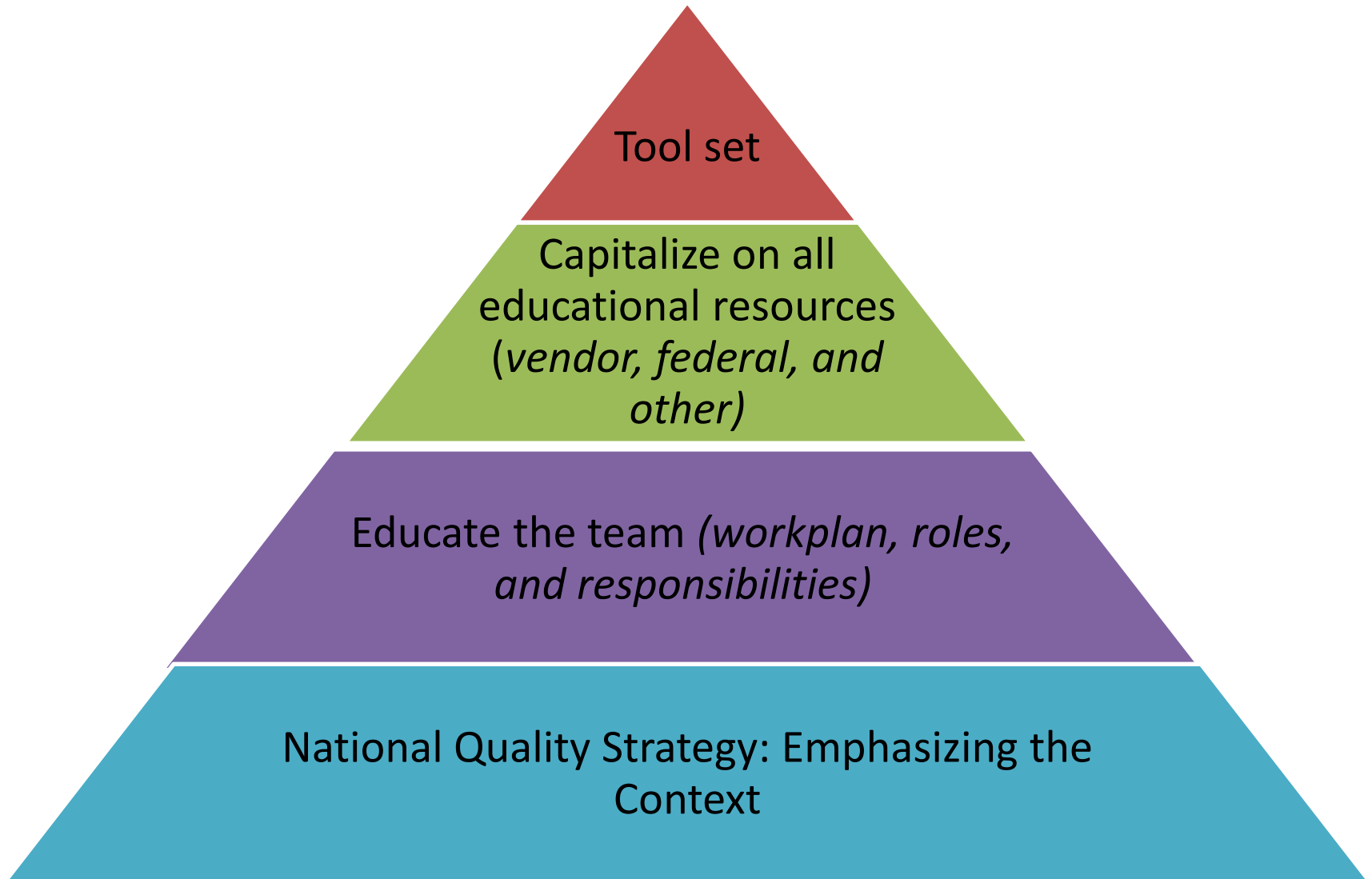
# Step-by-Step Explanation of Process for Implementing Measure Updates

# Step 1: Get Update



A Study of the Impact of Meaningful Use Clinical Quality Measures. Eisenberg et al., 2013.
http://www.aha.org/content/13/13ehrchallenges-report.pdf

- Specifications (human-readable rendition and machine-readable XML)

- Release Notes

- Logic Guidance and Logic Flows

- Value Sets

- Quality Reporting Data Architecture (QRDA) Implementation Guide

# How to Access Annual Updates/Specifications



http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/eCQM_Library.html

# How do I determine which measures are in the program?



**May 2015 Update for eReporting for the 2016 Reporting Year:**

- 2014 eCQMs for Eligible Professionals Table May 2015
- 2014 eCQM Specifications for Eligible Professionals Update May 2015
- 2014 eCQM Measure Logic Guidance v1.10 Update May 2015
- 2014 eCQM Technical Release Notes Update May 2015

The **eCQM Measures Table** lists which measures are included in the referenced reporting year

CLINICAL QUALITY MEASURES FOR 2014 CMS EHR INCENTIVE PROGRAMS FOR ELIGIBLE PROFESSIONALS

| CMS eMeasure ID (For Reporting in 2016) | NQF # | Measure Title and CMS Domain | Measure Description | Numerator Statement | Denominator Statement | Measure Steward | PQRS# |
|---|---|---|---|---|---|---|---|
| CMS146v4 | 0002 | Appropriate Testing for Children with Pharyngitis

Domain: Efficient Use of Healthcare Resources | Percentage of children 2-18 years of age who were diagnosed with pharyngitis, ordered an antibiotic and received a group A streptococcus (strep) test for the episode. | Children with a group A streptococcus test in the 7-day period from 3 days prior through 3 days after the diagnosis of pharyngitis | Children 2-18 years of age who had an outpatient or emergency department (ED) visit with a diagnosis of pharyngitis during the measurement period and an antibiotic ordered on or three days after the visit | National Committee for Quality Assurance | 066 |
| CMS137v4 | 0004 | Initiation and Engagement of Alcohol and Other Drug Dependence Treatment | Percentage of patients 13 years of age and older with a new episode of alcohol and | Numerator 1: Patients who initiated treatment within 14 days of the | Patients age 13 years of age and older who were diagnosed with a new | National Committee for Quality Assurance | 305 |

http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/eCQM_Library.html

# Where do I find information about each of the measures?

May 2015 Update for eReporting for the 2016 Reporting Year:

- 2014 eCQMs for Eligible Professionals Table May 2015
- 2014 eCQM Specifications for Eligible Professionals Update May 2015
- 2014 eCQM Measure Logic Guidance v1.10 Update May 2015
- 2014 eCQM Technical Release Notes Update May 2015

**eCQM Specifications** are comprised of ZIP files with human-readable rendition (HTML) and machine-readable XML files



WinZip - eCQM_2014_EP_May2015

| Name | Type | Modified | Size |
|------|------|----------|------|
| EP_CMS68v5_NQF0419_Current_Meds_Documented.zip | WinZip File | 4/3/2015 12:46 PM | 26,560 |
| EP_CMS123v4_NQF0056_Diab_Foot.zip | WinZip File | 4/3/2015 12:57 PM | 19,498 |
| EP_CMS129v5_NQF0389_PrCA_OveruseBoneScan.zip | WinZip File | 4/3/2015 12:59 PM | 20,301 |
| EP_CMS130v4_NQF0034_Colorectal_Cancer_Screen.zip | WinZip File | 4/3/2015 1:00 PM | 20,413 |
| EP_CMS132v4_NQF0564_CATARACTS_30daycomp.zip | WinZip File | 4/3/2015 1:02 PM | 44,356 |
| EP_CMS133v4_NQF0565_CATARACTS_2040.zip | WinZip File | 4/3/2015 1:03 PM | 56,391 |
| EP_CMS134v4_NQF0062_Diab_Urine.zip | WinZip File | 4/3/2015 1:16 PM | 21,172 |
| EP_CMS136v5_NQF0108_ADHD_FollowUp.zip | WinZip File | 4/3/2015 1:26 PM | 35,398 |
| EP_CMS137v4_NQF0004_Ini_Eng_Alc_Drug_Dep.zip | WinZip File | 4/3/2015 1:28 PM | 24,376 |
| EP_CMS140v4_NQF0387_BrCA_HormonalTherapy.zip | WinZip File | 4/3/2015 1:29 PM | 35,232 |
| EP_CMS141v5_NQF0385_ColonCA_ChemoStageIII.zip | WinZip File | 4/3/2015 1:30 PM | 41,263 |
| EP_CMS146v4_NQF0002_Pharyngitis.zip | WinZip File | 4/3/2015 1:32 PM | 21,771 |
| EP_CMS148v4_NQF0060_HbA1c_Test_Ped.zip | WinZip File | 4/3/2015 1:33 PM | 17,176 |
| EP_CMS149v4_NQFXXXX_DEMENTIA_Cognitive.zip | WinZip File | 4/3/2015 1:35 PM | 23,622 |

Address: 2014_eCQM_Eligible Professional_May2015\

Selected 0 files, 0 bytes — Total 64 files, 1,750KB

http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/eCQM_Library.html

# Measure Specification: Human-Readable Rendition

| eMeasure Title | Diabetes: Hemoglobin A1c Poor Control | | |
|---|---|---|---|
| eMeasure Identifier (Measure Authoring Tool) | 122 | eMeasure Version number | 4.0.000 |
| NQF Number | 0059 | GUID | f2986519-5a4e-4149-a8f2-af0a1dc7f6bc |
| Measurement Period | January 1, 20XX through December 31, 20XX | | |
| Measure Steward | National Committee for Quality Assurance | | |
| Measure Developer | National Committee for Quality Assurance | | |
| Endorsed By | National Quality Forum | | |
| Description | Percentage of patients 18-75 years of age with diabetes who had hemoglobin A1c > 9.0% during the measurement period. | | |

| Clinical Recommendation Statement | American Geriatrics Society (Brown et al. 2003): |
|---|---|
| | For frail older adults, persons with life expectancy of less than 5 years, and others in whom the risks of intensive glycemic control appear to outweigh the benefits, a less stringent target such as 8% is appropriate. (Quality of Evidence: Level III; Strength of Evidence: Grade B) |
| | American Diabetes Association (2009): |
| | Lowering A1C to below or around 7% has been shown to reduce microvascular and neuropathic complications of type 1 and type 2 diabetes. Therefore, for microvascular disease prevention, the A1C goal for non-pregnant adults in general is <7%. (Level of Evidence: A) |
| | In type 1 and type 2 diabetes, randomized controlled trials of intensive versus standard glycemic control have not shown a significant reduction in CVD outcomes during the randomized portion of the trials. Long-term follow-up of the Diabetes Control and Complications Trial (DCCT) and [...] that treatment to A1C targets below or around 7% in th[...] with long-term reduction in risk of macrovascular disease. U[...] <7% appears reasonable for many adults for macrovas[...] |
| | Subgroup analyses of clin[...] |

The header contains metadata about the eCQM

| Initial Population | Patients 18-75 years of age with diabetes w[...] |
|---|---|
| Denominator | Equals Initial Population |
| Denominator Exclusions | None |
| Numerator | Patients whose most recent HbA1c level (performed during the measurement period) is >9.0% |
| Numerator Exclusions | Not Applicable |
| Denominator Exceptions | None |

# Measure Specification: Human-Readable Rendition, Cont.

Health**IT**.gov

**Population Criteria**

- **Initial Population =**
  - AND: "Diagnosis, Active: Diabetes" overlaps "Measurement Period"
  - AND: Age >= 18 year(s) at: "Measurement Period"
  - AND: Age < 75 year(s) at: "Measurement Period"
  - AND: Union of:
    - "Encounter, Performed: Office Visit"
    - "Encounter, Performed: Face-to-Face Interaction"
    - "Encounter, Performed: Preventive Care Services - Established Office Visit, 18 and Up"
    - "Encounter, Performed: Preventive Care Services-Initial Office Visit, 18 and Up"
    - "Encounter, Performed: Home Healthcare Services"
    - "Encounter, Performed: Annual Wellness Visit"
    - during "Measurement Period"
- **Denominator =**
  - AND: Initial Population
- **Denominator Exclusions =**
  - None
- **Numerator =**
  - AND:
    - OR: "Laboratory Test, Performed: HbA1c Laboratory Test" satisfies all
      - Most recent: (result) during "Measurement Period"
        - (result > 9 %)
      - OR:
        - AND: Most recent: "Occurrence A of Laboratory Test, Performed: HbA1c Laboratory Test" during "Measurement Period"
        - AND NOT: "Occurrence A of Laboratory Test, Performed: HbA1c Laboratory Test (result)"
      - OR NOT: "Laboratory Test, Performed: HbA1c Laboratory Test" during "Measurement Period"
- **Numerator Exclusions =**
  - None
- **Denominator Exceptions =**
  - None
- **Stratification =**
  - None

**Data Criteria (QDM Variables)**

- None

**Data Criteria (QDM Data Elements)**

- "Diagnosis, Active: Diabetes" using "Diabetes Grouping Value Set (2.16.840.1.113883.3.464.1003.103.1...
- "Encounter, Performed: Annual Wellness Visit" using "Annual Wellness Visit Grouping Value Set (2.16.840...
- "Encounter, Performed: Face-to-Face Interaction" using "Face-to-Face Interaction Grouping Value Set (2...
- "Encounter, Performed: Home Healthcare Services" using "Home Healthcare Services Grouping Value Set...
- "Encounter, Performed: Office Visit" using "Office Visit Grouping Value Set (2.16.840.1.113883.3.464.100...
- "Encounter, Performed: Preventive Care Services - Established Office Visit, 18 and Up" using "Preventive C... (2.16.840.1.113883.3.464.1003.101.12.1025)"
- "Encounter, Performed: Preventive Care Services-Initial Office Visit, 18 and Up" using "Preventive Care Services-Initial Office Visit, 18 and Up Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1023)"
- "Laboratory Test, Performed: HbA1c Laboratory Test" using "HbA1c Laboratory Test Grouping Value Set (2.16.840.1.113883.3.464.1003.198.12.1013)"

**Supplemental Data Elements**

- "Patient Characteristic Ethnicity:...
- "Patient Characteristic Payer: Pay...
- "Patient Characteristic Race: Rac...
- "Patient Characteristic Sex: ONC...

**Risk Adjustment Variables**

- None

The remainder of the human-readable file provides the measure logic (above), a list of QDM data elements (left), and other calculation information

# Measure Specification: Machine-Readable (XML)

The XML translates metadata from human-readable header (right) into computer code (below)

| eMeasure Title | Diabetes: Hemoglobin A1c Poor Control | | |
|---|---|---|---|
| eMeasure Identifier (Measure Authoring Tool) | 122 | eMeasure Version number | 4.0.000 |
| NQF Number | 0059 | GUID | f2986519-5a4e-4149-a8f2-af0a1dc7f6bc |
| Measurement Period | January 1, 20XX through December 31, 20XX | | |
| Measure Steward | National Committee for Quality Assurance | | |
| Measure Developer | National Committee for Quality Assurance | | |
| Endorsed By | National Quality Forum | | |
| Description | Percentage of patients 18-75 years of age with diabetes who had hemoglobin A1c > 9.0% during the measurement period. | | |

```xml
- <measure>
  - <measureDetails>
      <uuid>40280381-4b9a-3825-014b-e0a9409212a3</uuid>
      <title>Diabetes: Hemoglobin A1c Poor Control</title>
      <shortTitle>Diab_HbA1c_Ctrl</shortTitle>
      <emeasureid>122</emeasureid>
      <guid>f2986519-5a4e-4149-a8f2-af0a1dc7f6bc</guid>
      <version>4.0.000</version>
      <nqfid extension="0059" root="2.16.840.1.113883.3.560.1"/>
    - <period calenderYear="true" uuid="40280381-3d61-56a7-013e-622405702575">
        <startDate>00000101</startDate>
        <stopDate>00001231</stopDate>
      </period>
      <steward id="2.16.840.1.113883.3.464">National Committee for Quality Assurance</steward>
    - <developers>
        <developer id="2.16.840.1.113883.3.464">National Committee for Quality Assurance</developer>
      </developers>
      <endorsement id="2.16.840.1.113883.3.560">National Quality Forum</endorsement>
    - <description>
        Percentage of patients 18-75 years of age with diabetes who had hemoglobin A1c > 9.0% during the measurement period.
      </description>
  - <copyright>
      Physician Performance Measure (Measures) and related data specifications were developed by the National Committee for Quality Assurance
```

# Measure Specification: Machine-Readable (XML), Cont.

The XML also contains code (below) to reflect the population criteria (right)

- None
- **Numerator =**
  - AND:
    - OR: "Laboratory Test, Performed: HbA1c Laboratory Test" satisfies all
      - Most recent: (result) during "Measurement Period"
      - (result > 9 %)

```
– <subTree displayName="Lab Test Performed satisfies all most recent and result" qdmVariable="false" uuid="4EA6F452-8BFB-
   4B01-A3D2-06FACACF0ADA">
   – <functionalOp displayName="SATISFIES ALL" type="SATISFIES ALL">
      <elementRef displayName="HbA1c Laboratory Test : Laboratory Test, Performed" id="3b63e1f8-aaf3-4b56-9869-eb05ccc33687"
      type="qdm"/>
   – <functionalOp displayName="MOST RECENT" type="MOST RECENT">
      – <relationalOp displayName="During" type="DURING">
         – <elementRef displayName="HbA1c Laboratory Test : Laboratory Test, Performed" id="3b63e1f8-aaf3-4b56-9869-eb05ccc33687"
           type="qdm">
            <attribute attrUUID="17476d8a-138e-4412-99a0-db147ef7f6e9" mode="Check if Present" name="result"/>
         </elementRef>
         <elementRef displayName="Measurement Period : Timing Element" id="40280381-3d61-56a7-013e-622405702575" type="qdm"/>
      </relationalOp>
   </functionalOp>
   – <elementRef displayName="HbA1c Laboratory Test : Laboratory Test, Performed" id="3b63e1f8-aaf3-4b56-9869-eb05ccc33687" type="qdm">
      <attribute attrUUID="58508ecc-3f17-4436-8773-8be28d508835" comparisonValue="9" mode="Greater Than" name="result" unit="%"/>
   </elementRef>
```

# How should I implement changes?

**May 2015 Update for eReporting for the 2016 Reporting Year:**

- 2014 eCQMs for Eligible Professionals Table May 2015
- 2014 eCQM Specifications for Eligible Professionals Update May 2015
- 2014 eCQM Measure Logic Guidance v1.10 Update May 2015
- 2014 eCQM Technical Release Notes Update May 2015

**CMS**
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Health Information Technology

Centers for Medicare & Medicaid Services
Office of the National Coordinator for Health Information Technology

**Electronic Clinical Quality Measure Logic and
Implementation Guidance**

Version 1.10

May 1, 2015

The **eCQM Logic and Implementation Guidance** provides information and recommendations to support implementation, including defining how specific logic and data elements should be conceptualized and addressed during implementation of eCQMs.

http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/eCQM_Library.html

# What are the changes for my measures?

HealthIT.gov

**May 2015 Update for eReporting for the 2016 Reporting Year:**

- 2014 eCQMs for Eligible Professionals Table May 2015
- 2014 eCQM Specifications for Eligible Professionals Update May 2015
- 2014 eCQM Measure Logic Guidance v1.10 Update May 2015
- 2014 eCQM Technical Release Notes Update May 2015

**Technical Release Notes** provide a list of all changes by measure so that you can focus on those that you report on and identify the updates that require action

eCQM_TechNotes2015.pdf

Open    Create

1 / 116    96.1%    Tools

**Bookmarks**

Technical Release Notes: 2015 Annual Update of 2014 Eligible Hospitals and Eligible Professionals Electronic Clinical Quality Measures (eCQMs)

CMS9v4 -Exclusive Breast Milk Feeding

CMS26v3 - Home Management Plan of Care (HMPC) Document Given to Patient/Caregiver

CMS30v5 - Statin Prescribed at Discharge

CMS31v4 - Hearing Screening Prior To Hospital Discharge

CMS32v5 - Median Time from ED Arrival to ED Departure for Discharged ED Patients

**Technical Release Notes:**
**2015 Annual Update of 2014 Eligible Hospitals and Eligible Professionals Electronic Clinical Quality Measures (eCQMs)**

http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/eCQM_Library.html

# QRDA Implementation Guide and Other Resources

# Where else can I find information about the eCQMs?



https://ecqi.healthit.gov/

# Where can I find the updated value sets?



The **Value Set Authority Center (VSAC)** publishes updated eCQM value sets annually.

The **Downloadable Resource Table** provides prepackaged downloads for the most recently updated and released eCQM value sets, as well as for previously released versions.

https://vsac.nlm.nih.gov

# VSAC Value Sets



Download value sets by measure, value set name, or quality data model category

# Code System Versions for 2015 Annual Update

HealthIT.gov

| Code System | Versions for 2015 EH and EP Release |
|---|---:|
| AdministrativeSex | HL7V3 |
| CDCREC | 1.0 |
| CDT | 2015 |
| CPT | 2015 |
| CVX | 2015 |
| DischargeDisposition | HL7V3 |
| HCPCS | 2015 |
| HSLOC | 2010 |
| ICD10CM | 2014 |
| ICD10PCS | 2014 |
| ICD9CM | 2013 |
| LOINC | 2.50 |
| RXNORM | 2015-01 |
| SNOMEDCT | 2014-09 |
| SOP | 5.0 |

A Study of the Impact of Meaningful Use Clinical Quality Measures. Eisenberg et al., 2013.
http://www.aha.org/content/13/13ehrchallenges-report.pdf
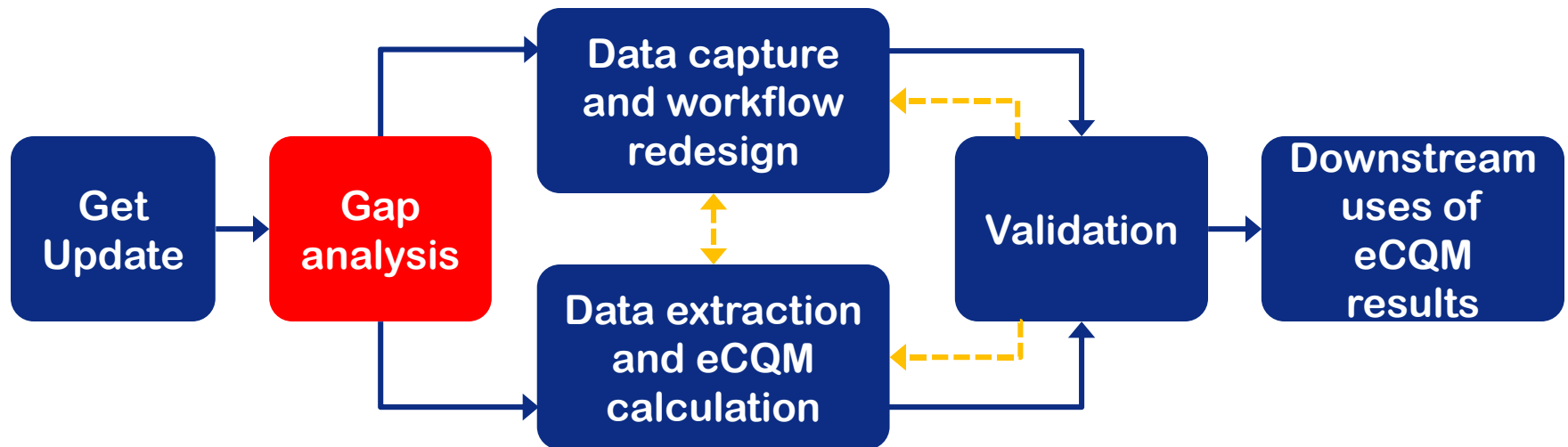
- New data elements > data capture, workflow and mappings (e.g., PC-01)

- Changes to data elements/value sets > mappings (e.g., oral factor Xa inhibitors)

- Change to logic > data capture (e.g., timing thresholds)

- Other changes that impact calculation (e.g., updates to inclusion/exclusion criteria)

# Step 3: Data Capture and Workflow Redesign

A Study of the Impact of Meaningful Use Clinical Quality Measures. Eisenberg et al., 2013.
http://www.aha.org/content/13/13ehrchallenges-report.pdf
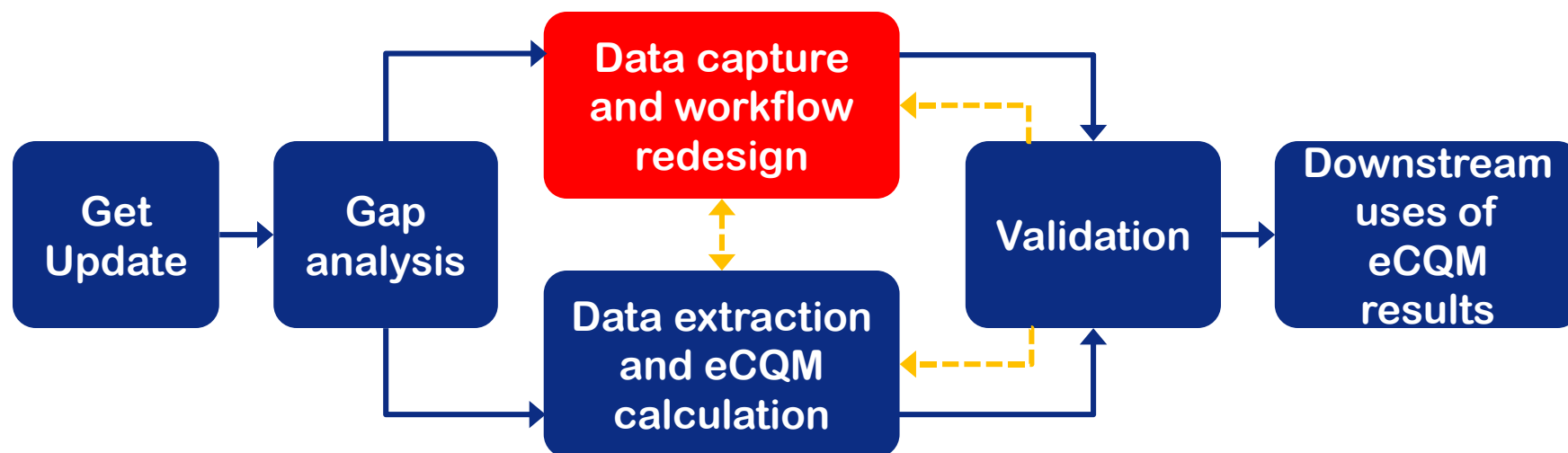
- ## Data Capture
  - New query build
  - Interface to bring data from disparate application into certified electronic health record technology (CEHRT)
  - Deploy alerts, reminders, and order sets judiciously
- ## Workflow redesign
  - Work with subject matter experts to determine where/how data should be captured (e.g., cardiovascular services)
  - Evaluate aspects of care coordination or transitions of care

- Definitions of workflow vary:
  - The flow of work through space and time, where work is comprised of three components: *inputs* are *transformed* into *outputs.*[1]
  - The activities, tools, and processes needed to produce or modify work, products, or services.  More specifically, clinical workflow encompasses all of the 1) activities, 2) technologies, 3) environments, 4) people, and 5) organizations engaged in providing and promoting health care.[2]

1. Carayon P, Karsh, BT. Workflow toolkit and lessons in user-centered design. Paper presented at the AHRQ Annual Health IT Grantee and Contractor Meeting; 2010 June 2-4; Washington, DC.

2. Niazkhani Z, van der Sijs H, Pirnejad H, Redekop W, Aarts J.  Same system, different outcomes: Comparing the transitions from two paper-based systems to the same computerized physician order entry system. International Journal of Medical Informatics 2009; 78(3): 170-181.

Agency for Healthcare Research and Quality. What Is Workflow. Rockville MD. October 2010.
http://healthit.ahrq.gov/health-it-tools-and-resources/workflow-assessment-health-it-toolkit/presentations

**Step 1:** Decide what processes to examine

**Step 2:** Create a preliminary flowchart

**Step 3:** Add detail to the flowchart

**Step 4:** Determine who you need to observe and interview

**Step 5:** Do the observations and interviews

# Is workflow just the sequence of steps of a process?

- Not exactly

- Workflow is the sequence of **physical** and **mental** tasks performed by **various people** over **time** and through **space**
  - It can occur at different and/or multiple levels (e.g., one person, between people, or across organizations)
  - It can occur sequentially or simultaneously

Agency for Healthcare Research and Quality. What Is Workflow. Rockville MD. October 2010.
http://healthit.ahrq.gov/health-it-tools-and-resources/workflow-assessment-health-it-toolkit/presentations

# Goals of a flowchart

- Shows how processes *really* happen, as opposed to how they are supposed to happen or how we expect they will happen

- Allows a better understanding of what contributes to different types of flows for the same processes

- Helps to identify ways to improve the flows

- Can illustrate ways that health IT will affect workflows

Agency for Healthcare Research and Quality. What Is Workflow. Rockville MD. October 2010.
http://healthit.ahrq.gov/health-it-tools-and-resources/workflow-assessment-health-it-toolkit/presentations

HealthIT.gov

- Both flowcharts show the workflow of "patient check-in"

- Both are accurate descriptions of the same process at a particular clinic, but only the figure on the right (#2) shows the details of *what the workflow really is*

- The details of the workflow will change when you implement health IT

  – If you don't understand the details, you cannot plan for the changes that will come.
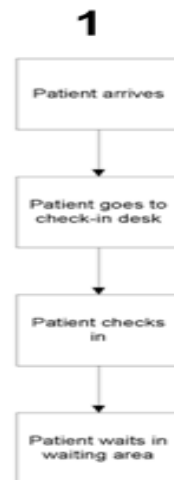
# Example: Swim Lane Diagram, Before Population



**CAH Case Study "Closed Loop" Medication Process Workflow and HIT Framework**

| Workflow Tasks & Information Flow | People to People ———— | System to System — — — | People to Systems ········ |
|---|---|---|---|

| | |
|---|---|
| **CAH Physician** | |
| **CAH Nurse** | |
| **Information Technology** | CPOE · Electronic Health Record (EHR) · Pharmacy Information System (RxIS) · Automated Dispensing Cabinet (ADC) · Bar Code Medication Admin (BCMA) · Billing · E-MAR |
| **Remote Pharmacist** | |

Implementing Shared Formulary and E-based Medication Order Review to Create "Closed Loop" Medication Process in Critical Access Hospitals (Text Version). December 2009. Agency for Healthcare Research and Quality, Rockville, MD. http://archive.ahrq.gov/news/events/conference/2009/wakefield/index.html

# Example: Swim Lane Diagram, After Population

CAH Case Study "Closed Loop" Medication Process and Information Flow

# Different Workflow Interactions
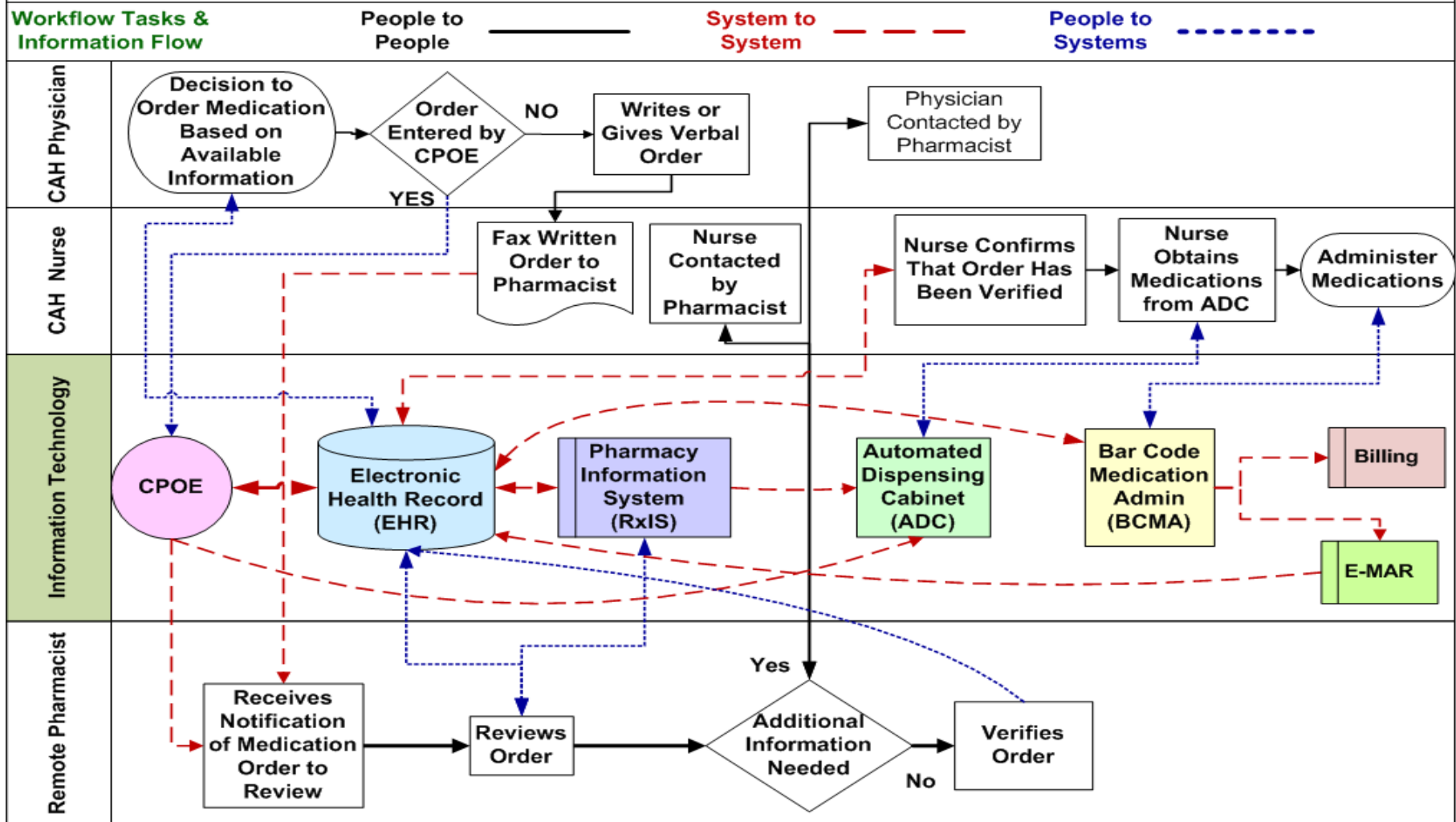
- Clinic-level workflow: the flow of information, in paper or electronic formats, among people at a practice or clinic.

- Intra-visit workflow: workflow during a patient visit

- Inter-organizational workflow: workflow between healthcare organizations

- Cognitive workflow: the workflow in the mind

Agency for Healthcare Research and Quality. What Is Workflow. Rockville MD. October 2010.
http://healthit.ahrq.gov/health-it-tools-and-resources/workflow-assessment-health-it-toolkit/presentations

- Compare measures

- Consider reporting modification or quality improvement

- Challenges to data identification and collection:

  – Unstructured data

  – Data latency

  – Discordant data

A Study of the Impact of Meaningful Use Clinical Quality Measures. Eisenberg et al., 2013.
http://www.aha.org/content/13/13ehrchallenges-report.pdf
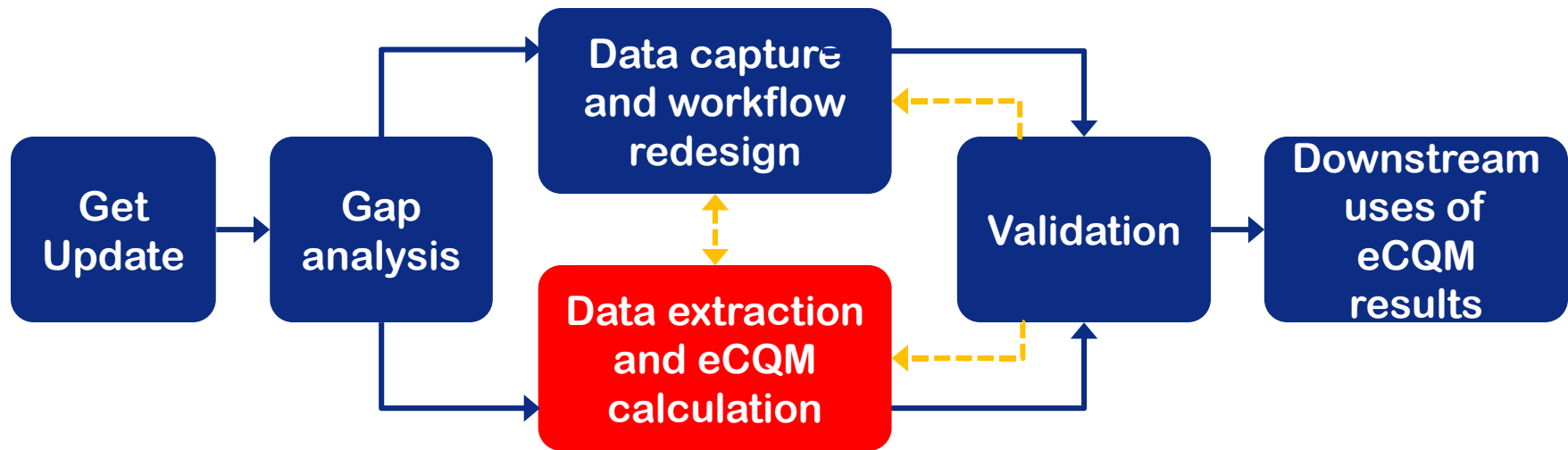
- Once data are available, move forward with data extraction and calculation

- Continue iterative process of validation

- Additional tweaks to data capture and/or workflow may be necessary after validation

- Remember to modify tracking documentation

http://www.albertpalacci.org/social-now/stock-footage-data-code-network-global-digital-matrix/

A Study of the Impact of Meaningful Use Clinical Quality Measures. Eisenberg et al., 2013.
http://www.aha.org/content/13/13ehrchallenges-report.pdf

# Validation
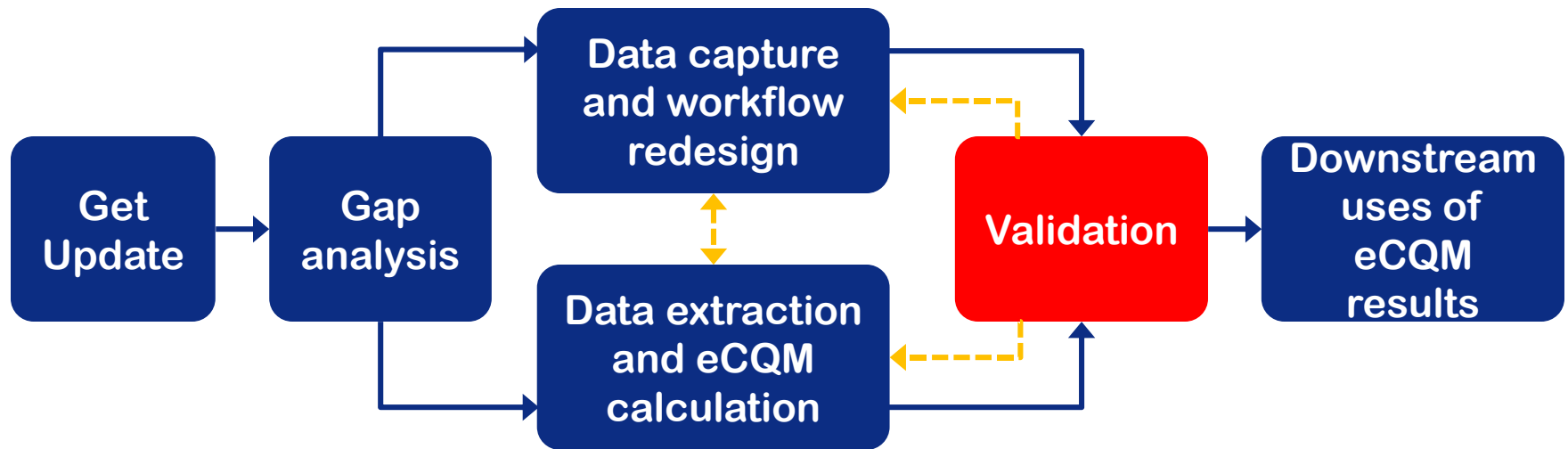
- Utilize available data, knowledge of patient population, and secondary data sources to review performance
- If performance not as expected, immediately engage entire collaborative team to determine the source:
  - Data capture issue
  - Mapping issue
  - Measure issue
  - Value set issue
  - Workflow issue

Get Update → Gap analysis → Data capture and workflow redesign → Validation → Downstream uses of eCQM results

Data extraction and eCQM calculation

A Study of the Impact of Meaningful Use Clinical Quality Measures. Eisenberg et al., 2013.
http://www.aha.org/content/13/13ehrchallenges-report.pdf
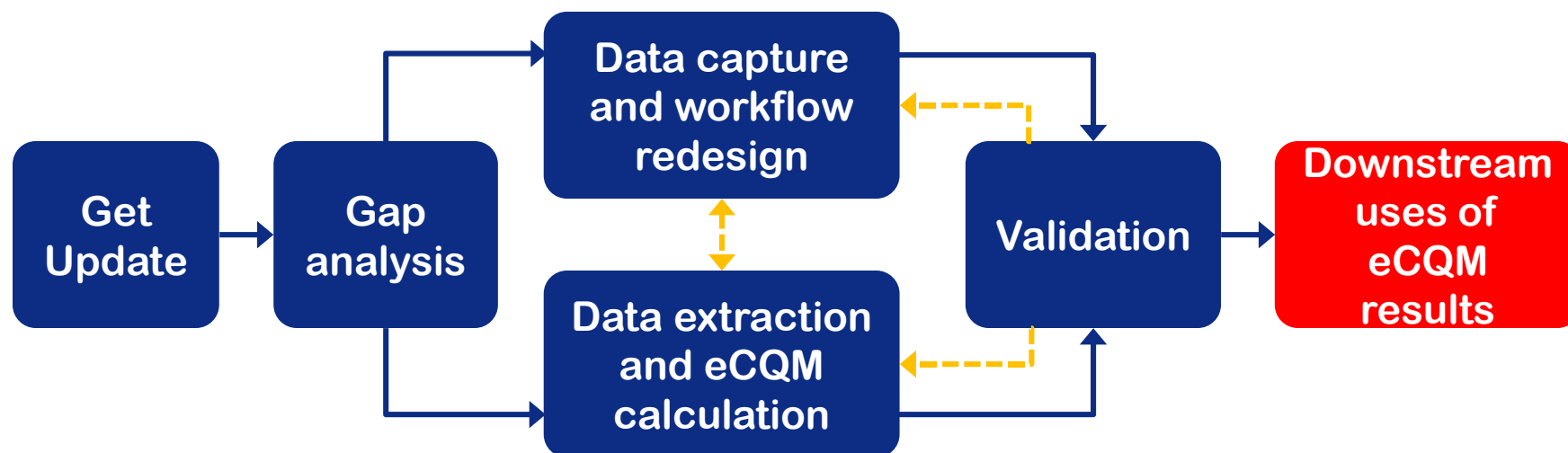
- Improve quality of care

- Decrease healthcare disparities

- Inform practice

- Propagate research

- Guide quality contracting or pay for performance

"An aligned portfolio of health IT-enabled quality measures supports all CMS public reporting, quality improvement, and value-based purchasing programs"

HealthIT.gov

A central piece of the long-term vision for CMS' physician quality reporting programs is to have a flexible portfolio of **quality and cost measures that are health IT-enabled** as much as possible. CMS will continue to move beyond "check box" process measures and will rely predominantly on clinical data from electronic sources, including but not limited to clinica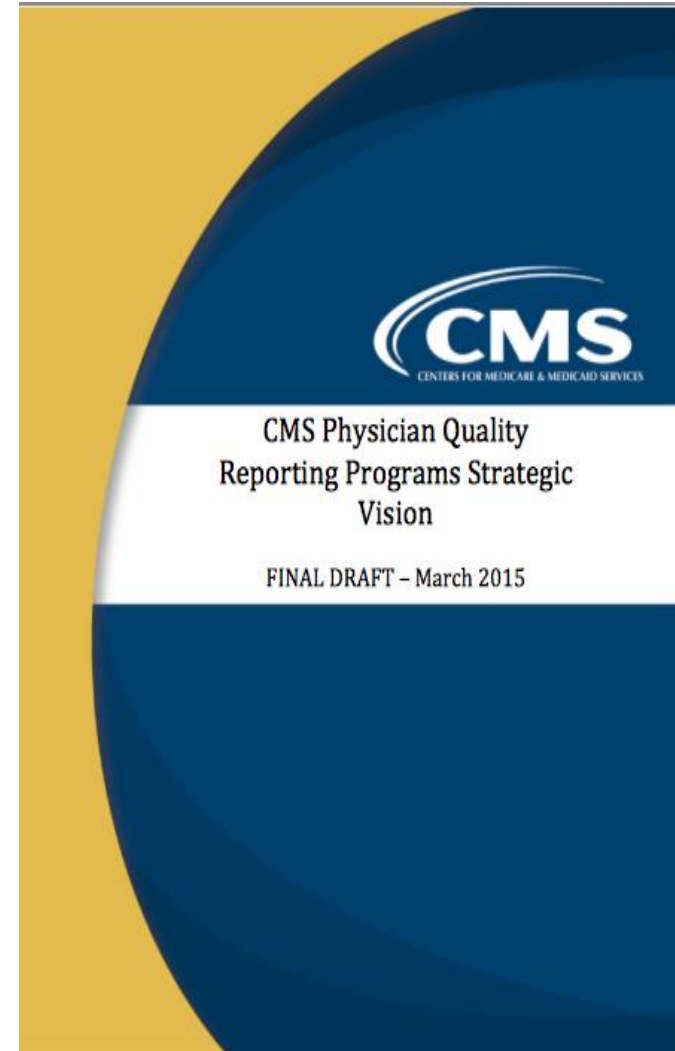l data registries and EHRs. CMS will collaborate with measure developers to ensure data for these measures are standardized in such a way that they can be **leveraged to support not only quality improvement programs, but also public reporting and payment programs across CMS, the private sector, and state Medicaid programs**.

CMS

CENTERS FOR MEDICARE & MEDICAID SERVICES

CMS Physician Quality Reporting Programs Strategic Vision

FINAL DRAFT – March 2015

http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/PQRS/Downloads/Physician_Quality_Reporting_Programs_Strategic_Vision_Document.pdf

HealthIT.gov

**Proposed CQM Reporting Periods and Associated Reporting Schema**

| Category | Meaningful Use Reporting Period in 2015 | CQM Reporting Period for 2015 | CQM Submission Period for 2015 | Reporting Schema |
|---|---|---|---|---|
| Eligible Hospitals/CAHs in First Year of Demonstrating Meaningful Use | | | | |
| Attestation | Any 90 consecutive days in FFY 2014 prior to July 1, 2015 | Identical to the selected MU reporting period | By July 1, 2015 | Submit aggregate data of 16 CQMs (from the finalized 29 CQMs), covering at least 3 National Quality Strategy (NQS) domains |
| Electronic submission | Any 90 consecutive days in FFY 2014 prior to July 1, 2015 | Either of the following two federal fiscal quarters: January 1 – March 31, 2015; or April 1 – June 30, 2015 | By July 1, 2015 | Submit patient-level data of 16 CQMs (from the finalized 28 CQMs**), covering at least 3 NQS domains and using the Quality Reporting Document Architecture (QRDA) Category I format |
| Eligible Hospitals/CAHs Beyond the First Year of Demonstrating Meaningful Use | | | | |
| Attestation | October 1, 2014 – September 30, 2015 | October 1, 2014 – September 30, 2015 | By November 30, 2015 | Submit aggregate data of 16 CQMs (from the finalized 29 CQMs), covering at least 3 NQS domains |
| Electronic submission* | October 1, 2014 – September 30, 2015 | Intentionally left blank | By November 30, 2015 | |
| | Intentionally left blank | January 1 – March 31, 2015 | By May 30, 2015 | Submit patient-level data of 16 CQMs (from the finalized 28 CQMs**), covering at least 3 NQS domains and using the QRDA Category I format |
| | | April 1 – June 30, 2015 | By August 30, 2015 | |
| | | July 1 – September 30, 2015 | By November 30, 2015 | |

\* Electronic submission for either the Medicare EHR Incentive Program only or aligned CQM reporting between the EHR Incentive and Hospital IQR Programs
\*\* ED-3, one of the 29 measures adopted in the Medicare EHR Incentive Program, is inapplicable for the Hospital IQR Program because it was deemed to ambulatory-based.

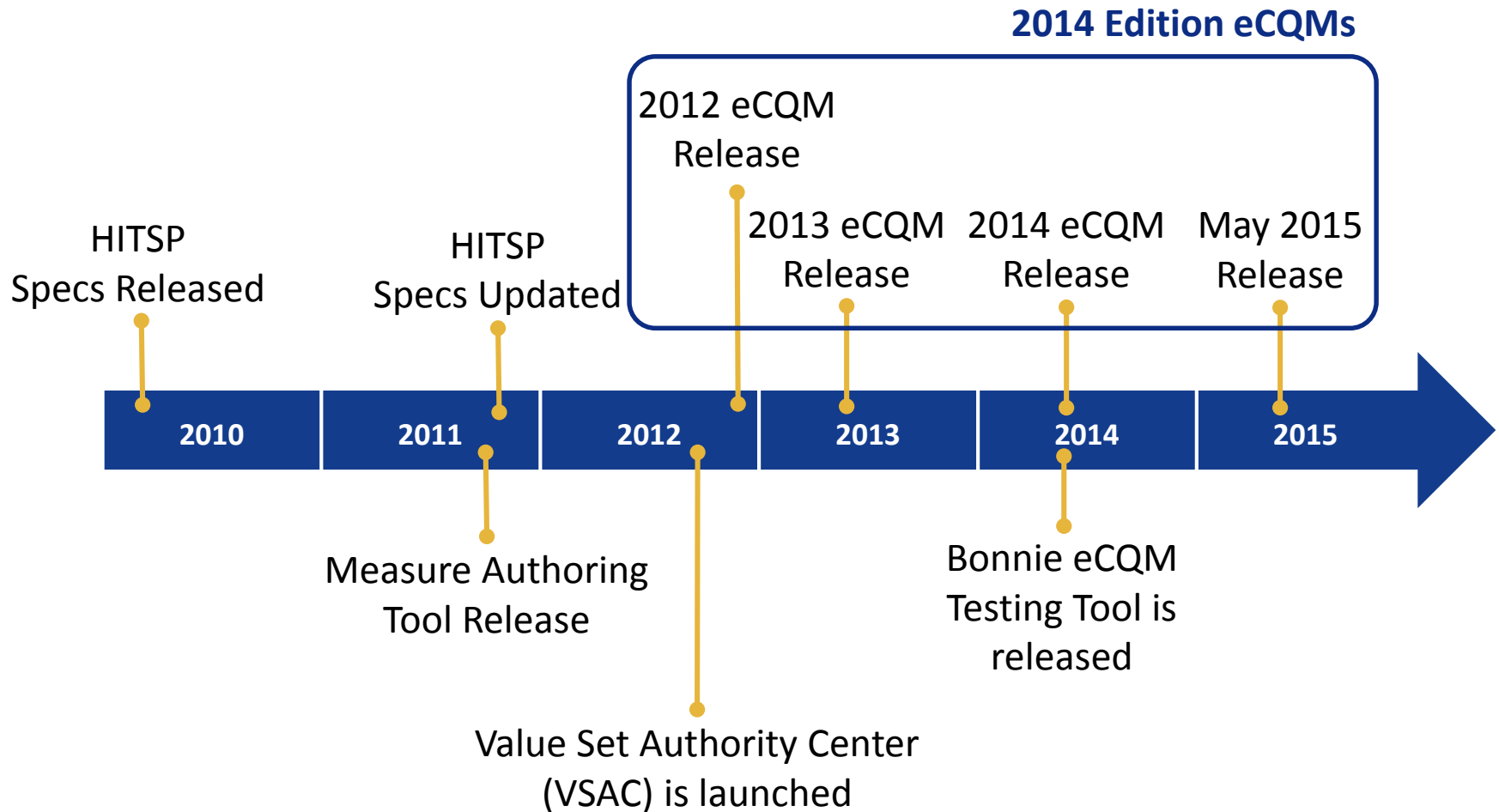CMS is considering requiring electronic submission for the Hospital Inpatient Quality Reporting Program beginning 2016.

The agency is requesting comments on this plan. The public comment period is open until June 16: For more information, please refer to http://www.regulations.gov.

http://www.ihealthbeat.org/perspectives/2014/proposed-2015-cqm-reporting-options-for-hospitals-participating-in-meaningful-use

# Overview of Measure Updates

# Behind the Scenes of eCQM Annual Updates

HealthIT.gov

**2014 Edition eCQMs**

2012 eCQM Release

2013 eCQM Release

2014 eCQM Release

May 2015 Release

HITSP Specs Released

HITSP Specs Updated

| 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |

Measure Authoring Tool Release

Bonnie eCQM Testing Tool is released

Value Set Authority Center (VSAC) is launched

# eCQM Development Eco-system

Standards

Models & Vocabularies

Tools

Measure Authoring Tool

Bonnie Testing Tool

Value Set Authority Center

Quality Data Model

Standard Vocab.

HQMF (Measure Specs)

QRDA (Patient Data)

CDA (Patient Data)
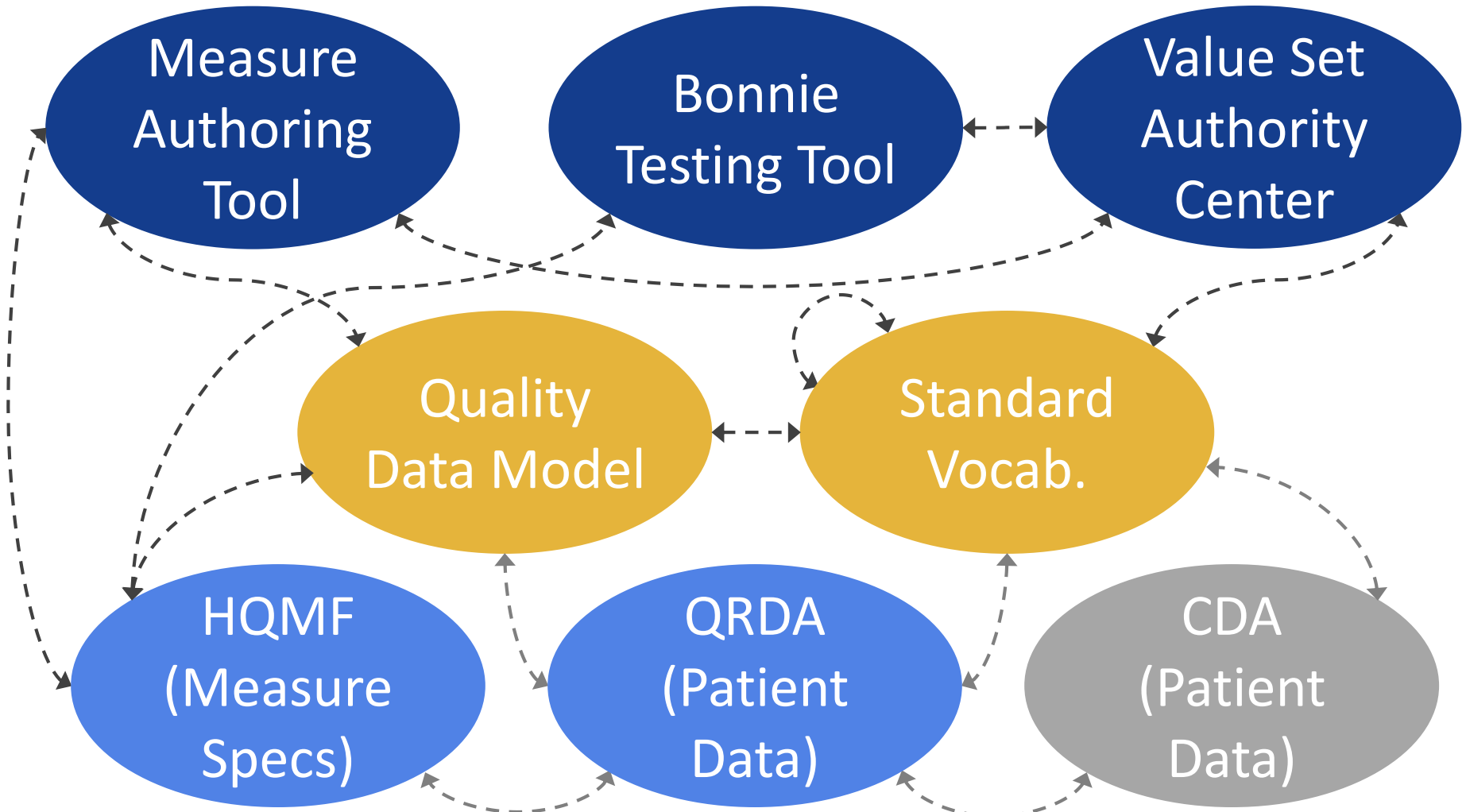
- Inputs to eCQM annual updates
  - JIRA eCQM issue tracking tool
    - Logic & value set errors (e.g., incorrect units/timing relationships, missing logic scenarios)
    - eCQM constructs misaligned with implementation constraints (e.g., allergies)
  - Clinical updates (literature, measure steward)
  - Updates to code systems, standards
    - New medications added to RxNorm every month
    - QDM updates to resolve eCQM expressivity issues (e.g., specific occurrences)

- QDM User Group
  - Information and materials for monthly meetings available at http://ecqi.healthit.gov/qdm
- Change Review Process
  - Email e-measures@mathematica-mpr.com if you want to observe monthly meetings
- HL7 clinical quality information workgroup
  - Overview, products, and information about regular meetings available at http://www.hl7.org/Special/committees/cqi/
- VSAC user form
  - Information monthly webinars (upcoming and archived) available at http://www.nlm.nih.gov/vsac/support/userforum/userforum.html

# eCQI Resource Center

## eCQI Resource Center
The one-stop shop for the most current resources to support electronic clinical quality improvement.

Spaces ▼

The one-stop shop for the most current resources to support electronic clinical quality improvement.

...community of professionals who are dedicated to clinical quality improvement for better health

To learn more about this resource, attend one of the upcoming webinars

### Getting Started
A *gentle* introduction to understanding electronic clinical quality improvement and measures

More information

### Putting eCQMs to Work
The who, what, when, where and why of eCQMs

More information

## Latest News

Wed 27 May — **2015 annual updates for the 2014 electronic clinical quality measures (eCQMs)**
CMS and ONC are excited to announce that the 2015 annual updates for the 2014 eCQMs are now on the eCQI Resource Center. Access the 29 updated measures for eligible hospitals and 64 updated measures for eligible professionals now.

Mon 18 May — **v1.3.7 Update of the Bonnie Electronic Clinical Quality Measure Testing Tool**
The Bonnie Clinical Quality Measure Testing Tool has been updated to support **Health Quality Measures Format (HQMF) R2.1** as the default import format when loading electronic clinical quality measure (eCQM) files that have been exported from the...

## Upcoming Events

**Jun 16 2015** — **MAT v4.2.0 Getting Better with Age**
The Measure Authoring Tool training webinar *MAT v4.2.0 Getting Better with Age* is being offered on Tuesday, June 16, 2015. During this live webinar, the MAT user community will have an opportunity to review updates and experience a live demonstration of the features and functionality to be included in the June 30, 2015 release.

MAT version 4.2.0 includes improved data sharing with the Value Set Authority Center (VSAC) and enhanced usability throughout the tool.

https://ecqi.healthit.gov/

- ## HQMF upgraded from R1 to R2.1
  - More information now available at http://www.hl7.org/implement/standards/product_brief.cfm?product_id=97
- ## Now reflects QDM version 4.1.1
  - Can now perform variable assignments
  - Able to add inline comments
  - Introduction of new operators - *Age At , Satisfies any / Satisfies all, Overlaps*
  - More information available at http://ecqi.healthit.gov/qdm
- ## QRDA Category I upgraded from R2 to R3
  - More information available at http://www.hl7.org/implement/standards/product_brief.cfm?product_id=35

The human-readable logic for the 2014 version of this measure was quite long

CMS 135 Heart Failure (HF): Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction (LVSD)

- **Initial Population =**
  - o AND: Age >= 18 year(s) at: "Measurement Period"
  - o AND:
    - OR:
      - Count >= 2 of: Union of:
        - "Encounter, Performed: Care Services in Long-Term Residential Facility" during "Measurement Period"
        - "Encounter, Performed: Home Healthcare Services" during "Measurement Period"
        - "Encounter, Performed: Nursing Facility Visit" during "Measurement Period"
        - "Encounter, Performed: Office Visit" during "Measurement Period"
        - "Encounter, Performed: Outpatient Consultation" during "Measurement Period"
        - "Encounter, Performed: Patient Provider Interaction" during "Measurement Period"
      - OR: "Encounter, Performed: Discharge Services - Hospital Inpatient" during "Measurement Period"
    - o AND: Occurrence A of $UnionEnc
- **Denominator =**
  - o AND: Initial Population
  - o AND:
    - OR: "Diagnostic Study, Performed: Ejection Fraction (result < 40 %)" starts before end of Occurrence A of $UnionEnc
    - OR: "Diagnosis, Active: Moderate or Severe LVSD" starts before end of Occurrence A of $UnionEnc
    - OR: "Diagnosis, Active: Left Ventricular Systolic Dysfunction (severity: Moderate or Severe)" starts before end of Occurrence A of $UnionEnc
- **Denominator Exclusions =**
  - o None
- **Numerator =**
  - o AND:
    - OR: "Medication, Order: ACE Inhibitor or ARB" during Occurrence A of $UnionEnc
    - OR: "Medication, Active: ACE Inhibitor or ARB" overlaps Occurrence A of $UnionEnc
- **Numerator Exclusions =**
  - o None
- **Denominator Exceptions =**
  - o OR: "Medication, Order not done: Medical Reason" for "ACE Inhibitor or ARB Ingredient" starts during Occurrence A of $UnionEnc
  - o OR: "Medication, Order not done: Patient Reason" starts during Occurrence A of $UnionEnc
  - o OR: "Medication, Order not done: System Reason" starts during Occurrence A of $UnionEnc
  - o OR: "Communication: From Patient to Provider Decline" starts during Occurrence A of $UnionEnc
  - o OR: "Medication, Allergy: ACE Inhibitor or ARB" $UnionEnc
  - o OR: "Diagnosis, Active: Allergy to ACE Inhibitor $UnionEnc
  - o OR: "Medication, Intolerance: ACE Inhibitor or
  - o OR: "Diagnosis, Active: Intolerance to ACE Inh $UnionEnc
  - o OR: "Diagnosis, Active: Pregnancy" overlaps O
  - o OR: "Diagnosis, Active: Renal Failure Due to A $UnionEnc
- **Stratification =**
  - o None

9

**Data Criteria (QDM Variables)**

- **$LTRFEnc =**
  - o "Encounter, Performed: Care Services in Long-Term Residential Facility" satisfies all
    - during "Measurement Period"
    - overlaps "Diagnosis, Active: Heart Failure"
- **$HHSEnc =**
  - o "Encounter, Performed: Home Healthcare Services" satisfies all
    - during "Measurement Period"
    - overlaps "Diagnosis, Active: Heart Failure"
- **$NFVEnc =**
  - o "Encounter, Performed: Nursing Facility Visit" satisfies all
    - during "Measurement Period"
    - overlaps "Diagnosis, Active: Heart Failure"
- **$OVEnc =**
  - o "Encounter, Performed: Office Visit" satisfies all
    - during "Measurement Period"
    - overlaps "Diagnosis, Active: Heart Failure"
- **$OCEnc =**
  - o "Encounter, Performed: Outpatient Consultation" satisfies all
    - during "Measurement Period"
    - overlaps "Diagnosis, Active: Heart Failure"
- **$F2FEnc =**
  - o "Encounter, Performed: Face-to-Face Interaction" satisfies all
    - during "Measurement Period"
    - overlaps "Diagnosis, Active: Heart Failure"
- **$InptDcSvcEnc =**
  - o "Encounter, Performed: Discharge Services - Hospital Inpatient" satisfies all
    - during "Measurement Period"
    - overlaps "Diagnosis, Active: Heart Failure"
- **$UnionEnc =**
  - o Union of:
    - $LTRFEnc
    - $HHSEnc
    - $NFVEnc
    - $OVEnc
    - $OCEnc
    - $F2FEnc
    - $InptDcSvcEnc

10

The 2015 version of this measure is significantly shorter as the result of updating to HQMF R2.1

# VSAC March 2015 API Update

This **API Update** allows value sets to be identified by version and expansion. 2015 measures will **not** contain internal references to versions—this functionality should be expected at the next update.

https://vsac.nlm.nih.gov

# BONNIE Patient Bank



http://bonnie.healthit.gov/

# BONNIE Complexity Analysis: Measure Comparisons



http://bonnie.healthit.gov/

# CYPRESS CMS IG Validator



https://validator.projectcypress.org/

*Panel:*

- Itara Barnes, Senior Associate Healthcare and Life Sciences Data & Analytics, KPMG

- Kimberly Bodine, Senior Director of Applied Clinical Informatics, Tenet Healthcare

- Rute Martins, Associate Project Director – eClinical, The Joint Commission

- Susan McBride, Professor, Texas Tech University Health Sciences Center

- Carolin Spice, CHC Technology Services Account Manager, Community Health Plan of Washington

*Moderator:*

Julia Skapik, Medical Officer, ONC

[Julia.skapik@hhs.gov](mailto:Julia.skapik@hhs.gov)

# Appendix: Other Information

# Abbreviations



| Term | Definition |
|------|------------|
| **ACOs** | Accountable Care Organizations |
| **CEHRT** | Certified Electronic Health Record Technology |
| **CQM** | Clinical Quality Measure |
| **EHR** | Electronic Health Record |
| **HL7** | Health Level Seven International (HL7) |
| **IQR** | Inpatient Quality Reporting |
| **PQRS** | Physician Quality Reporting System |
| **QDM** | Quality Data Model |
| **QRDA** | Quality Reporting Document Architecture |

# Definitions

| Term | Definition |
| --- | --- |
| **eMeasure or eCQM** | Electronic formatted clinical quality measures (here, using the HL7 standard QDM-based HQMF) |
| **QDM** | An "information model" intended to clearly define concepts used in quality measures and clinical care |
| **HQMF** | HL7 standard used to represent quality measures in an electronic format. |
| **Value set** | Lists of specific values (terms and their codes: CPT®, ICD-10-CM, LOINC®, MeSH®, RxNorm, SNOMED CT®, etc.) derived from single or multiple standard vocabularies used to define clinical concepts |
| **VSAC** | Library of value sets used by eCQM. Maintained by the National Library of Medicine |
| **QRDA** | HL7 standard document format for the exchange of eCQM data. QRDA reports represent eCQM data at the patient or organization level. |

# Quality Measurement (eCQM) Standards

- Measure Definition Standards
  - Quality Data Model (QDM)
  - Health Quality Measure Format (HQMF)
- Measure Reporting Standards
  - Quality Reporting Document Architecture (QRDA)
  - Category I for patient level data
  - Category III for aggregate data

Health**IT**.gov

You have several options for submitting your 2014 eCQM data.

**Reporting once:** Depending on your eligibility to participate in other CMS programs, you may be able to report quality measures one time during the 2014 program year in order to satisfy the CQM component of the Medicare EHR Incentive Program and satisfactorily participate in other programs, such as the Physician Quality Reporting System (PQRS) program.

**EHR incentive payment:** Attestations for the Medicare EHR Incentive Program are not complete until CQM data is submitted, so EHR incentive payments will be held until the electronic submission is processed. If you are a Medicaid eligible professional, you must submit your CQM data to your State Medicaid Agency.

If you are in your second year and beyond of Medicare EHR Incentive Program participation and choose to submit your CQMs electronically to receive credit for other CMS programs that require 12 months of CQM data, you will not receive EHR payment prior to 2015.

**Resources:** For more information about electronic submission of CQM data, visit the CMS website.

**To attest for the EHR Incentive Program, go to:**
**https://ehrincentives.cms.gov/hitech/login.action**

HealthIT.gov

For EP:

http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Downloads/CQM2014_GuideEP.pdf

**2014 AND BEYOND**

**ELIGIBLE PROFESSIONALS**

**9 OF A POSSIBLE 64 MEASURES**

- Choose from 3 different domains
- CMS has a recommended core set for adults and children

- Option 1: Attest through the EHR Registration & Attestation System
- Option 2: eReporting through PQRS
- Option 3: Satisfy requirements of PQRS Reporting Options
- Option 4: Group Reporting (GPRO)
- Option 5: Group Reporting through Pioneer ACO
- Option 6: Group Reporting through the Comprehensive Primary Care (CPC) Initiative

# CMS Reporting Guidance for EHs

For EH:

https://www.qualitynet.org/

For Q&A:

https://cms-ip.custhelp.com/app/home3/session/L3RpbWUvMTQyNzEzMzU1Ni9zaWQvMkEzdWwyaW0%3D

- Option 1: Attest through the EHR Registration & Attestation System
- Option 2: eReporting through Hospital Inpatient Quality Reporting (IQR) using QualityNet (more information at: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/HospitalRHQDAPU.html)

- Sticky Notes

- Software
  - Flow Charts
  - Gantt Charts
  - PERT Charts

- EHR Vendor
  - Templates
  - Workflow Engine Rules
  - Health Maintenance Module

# Questions about Meaningful Use, PQRS, or IQR?

Direct *MU Policy and Program* Questions to the following:

The Electronic Health Record (EHR) Information Center

EHR Information Center Hours of Operation:

7:30 a.m. – 6:30 p.m. (Central Time) Monday through Friday, except federal holidays.

1-888-734-6433* (primary number) *(press option 1) or 888-734-6563 (TTY number)

Direct *PQRS and IQR Policy and Program* Questions to the following:

QualityNet Help Desk (secure)

E-mail: qnetsupport@hcqis.org

Phone: (866) 288-8912

TTY: (877) 715-6222

Fax: (888) 329-7377