Future Certification Testing: Streamlined Test Requirements and Increased Test Robustness

A path to improved interoperability and first-pass data submission success

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IT

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- Review the past and current approaches to Cypress certification testing

- Discuss proposed approaches to increased test robustness and modular testing

- Offer potential opportunities to streamline existing testing through alignment with other program requirements

- Discuss prior approaches to test case creation and future testing paradigms

- Certify (verb)

  – To award a certificate attesting to … the passing of a qualifying exam

- Certification process

  – is a spot check, not an exhaustive test

  – If passed, increases confidence that vendor supports formats and calculations required by rule

- Cypress Certification Test Decks

  – Data that serves as basis for constructing a spot check of vendor capabilities

  – Can support vendors preparation for the certification test

  – Can support CMS testing of its computational infrastructure

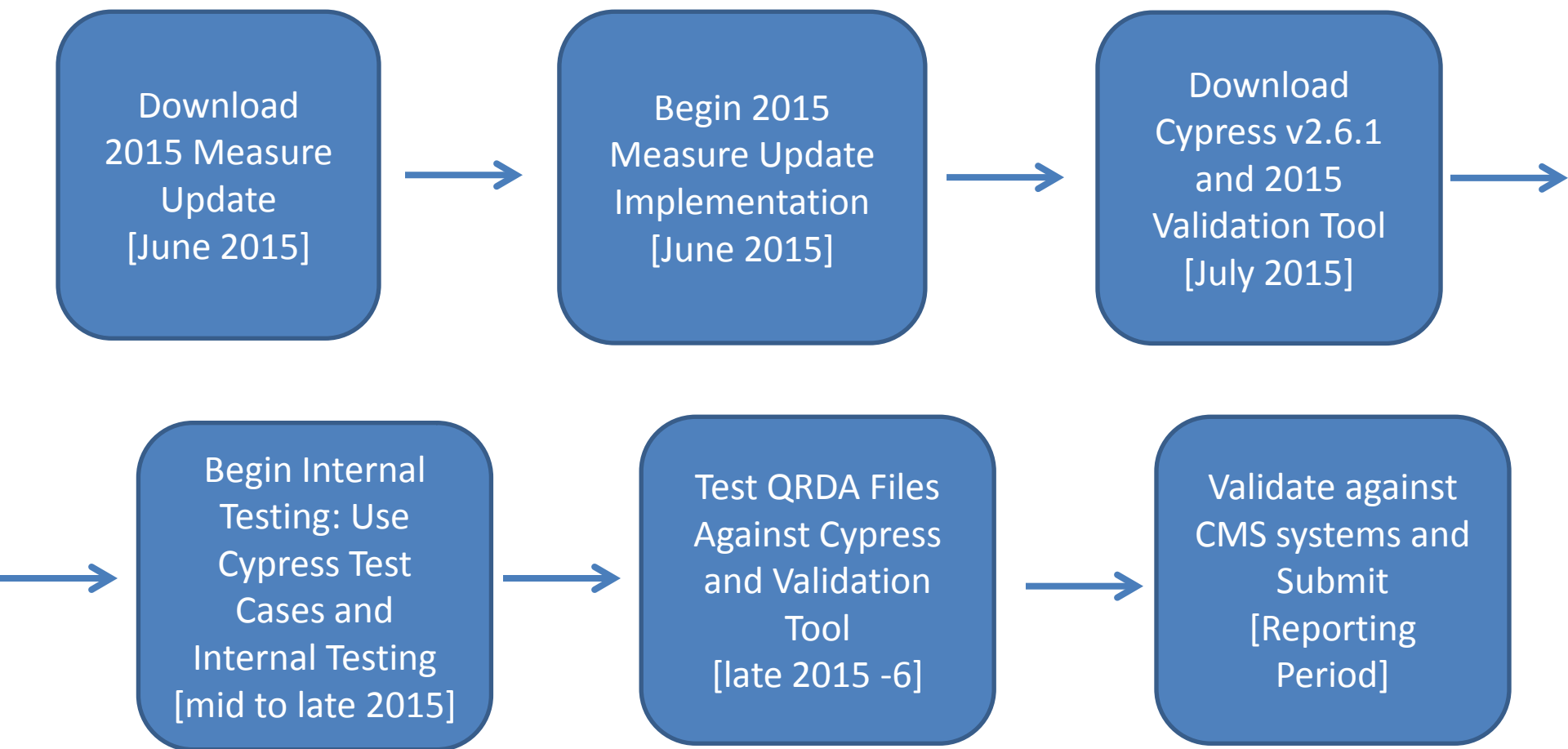# Certified Health IT Product and Vendor Trends
10/24/2014
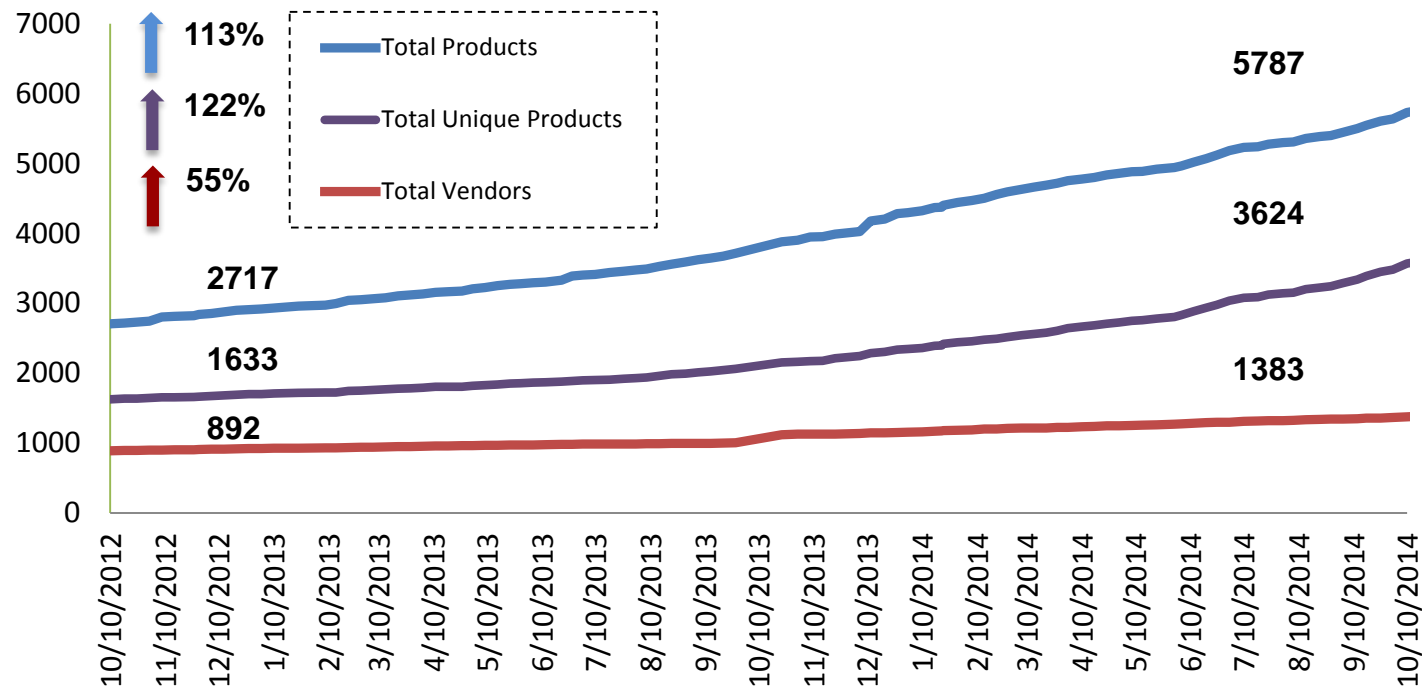
Product trends on this graph are reflective of the last 2 years of program operations. Date range 10/24/2012 – 10/24/2014

Current Cypress Functionality and Releases

July 2015 Cypress and Certification Paradigm

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Download 2015 Measure Update [June 2015]

→

Begin 2015 Measure Update Implementation [June 2015]

→

Download Cypress v2.6.1 and 2015 Validation Tool [July 2015]

→

Begin Internal Testing: Use Cypress Test Cases and Internal Testing [mid to late 2015]

→

Test QRDA Files Against Cypress and Validation Tool [late 2015 -6]

→

Validate against CMS systems and Submit [Reporting Period]

Cypress v2.6.1 Patch Release

- Cypress 2.6.1 has been updated to include:
  - Additional validation tests looking for minimum data
  - Relaxes some errors that are generated by too much data
  - Minor User Interface updates and installation procedures
- QRDA compliance evaluated against the HL7 QRDA Errata IG published in 2014
- Uses 2014 eCQM Annual Update and Measure Bundle v2.6.0 that was issued with the initial v2.6 release

- Will replace v2.6.0 and continue to be available for use in certification throughout 2015

- Errors are being returned by Cypress for QRDA Category I files that are reporting too much information

| Summary | XML Errors | XML Warnings | Record Name Mapping |

Errors

1. • {:message=>"File appears to contain data criteria outside that required by the measures. Valuesets in file not in measures tested [\"2.16.840.1.113883.3.1257.1.972\", \"2.16.840.1.113883.3.1257.1.1505\", \"2.16.840.1.113883.3.464.1.49\"]'", :msg_type=>:warning, :file_name=>"0_Ray_Arnold.xml"}

- **It is an Error to report data outside the scope of the measures being tested.**
- **However, the Cypress currently only allows QRDA-I files to be packaged with data for a single measure**
- **Cypress will be updated to allow for the submission of data for any measures the vendor is certifying**
  - **This will be released with a Cypress 2.6.1**

Cypress v2.7 Pretesting Version Only

- Cypress v2.7.0, the newest version of the electronic clinical quality measure (eCQM) testing tool was released July 23, 2015

- Cypress v2.7 supports the following
  - Supports **2015 eCQM Annual Update**
  - Aligns with the May 2015 release and the June corrections of Eligible Hospital and Eligible Professional eCQM specifications published by CMS
  - Aligns with HL7 **QRDA Category I Release 3** specification
  - Uses Measure Bundle v2.7.0

- ■ **Is *not* initially available for certification because the 2014 Certification Edition only applies to the current HL7 QRDA R2 specification. This version is a tool for testing the 2015 measure specifications and the new QRDA R3 requirements for CMS submissions**

- Cypress Demo Server will be updated to Cypress 2.6.1
  - https://demo.projectcypress.org

- Cypress 2.6.1 will be enforcing stronger passwords
  - As a result, all current user accounts will be removed on Saturday (during the scheduled server refresh)

- Separate and optional utility for testing QRDA conformance against the CMS QRDA Combined Implementation Guides (IGs)

- Supports both the 2015 and 2016 CMS QRDA Combined IG specifications

- Checks additional QRDA constraints required for CMS submission that are not tested with Cypress Certification which tests compliance to the base HL7 QRDA IG

Cypress Validation Utility
https://validator.projectcypress.org/

Health**IT**.gov

::::cypress validation utility

WARNING: This utility is meant for synthetic patient records only. **DO NOT** upload documents containing Protected Health Information (PHI) or Personally Identifiable Information (PII).

The Cypress QRDA Validation Utility is intended as a development tool for EHR vendors who are testing synthetic QRDA Category I and Category III documents for conformance to CMS submission requirements. Files submitted for validation must not contain PHI or PII.

Document

[   ] | Select QRDA file

2015 Reporting Program

| None (Base IG Only) | PQRS | HQR |

Document Type
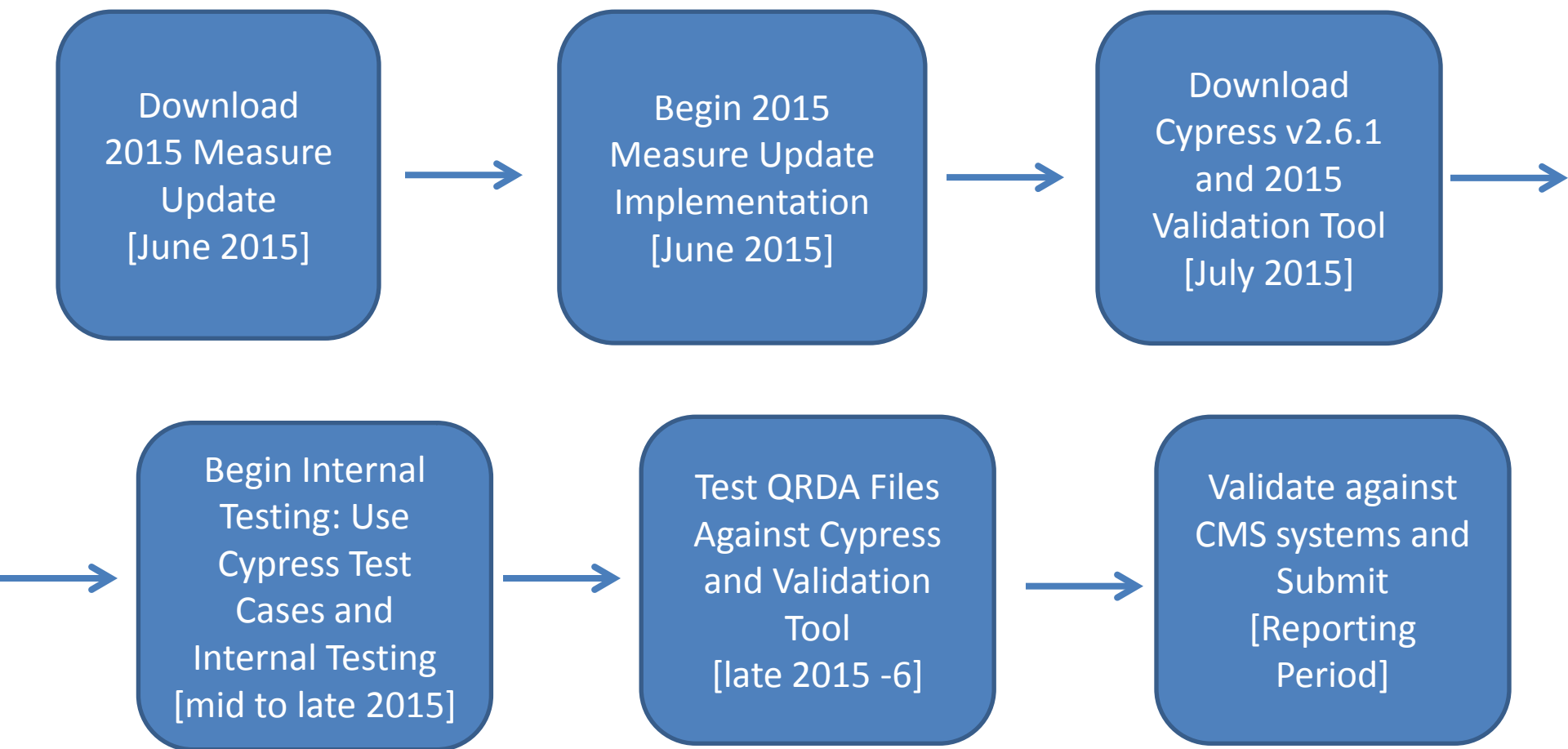
| QRDA Cat I | QRDA Cat III |

PHI Confirmation

Please check the box to acknowledge that you've read and understand the warning, and to the best of your knowledge, the submitted files will contain neither PII nor PHI: ☐

Submit

- ## Performance Rates
  - Cypress 2.7 will validate performance rates if they are provided in QRDA Cat III Files.
- ## Measure Duplication
  - Cypress will validate that measures and populations are only reported once.
- ## Measure Period
  - Cypress will validate that the correct measurement period is specified.
- ## Data Criteria Validation
  - Cypress will validate QRDA Cat I data criteria against all measures being tested.
- ## Smoking Gun Validation
  - Reverting Smoking Gun error handling back to Cypress 2.4.1.

July 2015 Cypress and Certification Paradigm

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Download 2015 Measure Update [June 2015] → Begin 2015 Measure Update Implementation [June 2015] → Download Cypress v2.6.1 and 2015 Validation Tool [July 2015] →

→ Begin Internal Testing: Use Cypress Test Cases and Internal Testing [mid to late 2015] → Test QRDA Files Against Cypress and Validation Tool [late 2015 -6] → Validate against CMS systems and Submit [Reporting Period]

Meaningful Use Stage 3: Proposed Rule Criteria for Certification

MU3 Certification
Clinical Quality Measure Proposed Criteria

2014 Edition

- CQMs – record and export

- CQMs – import and calculate
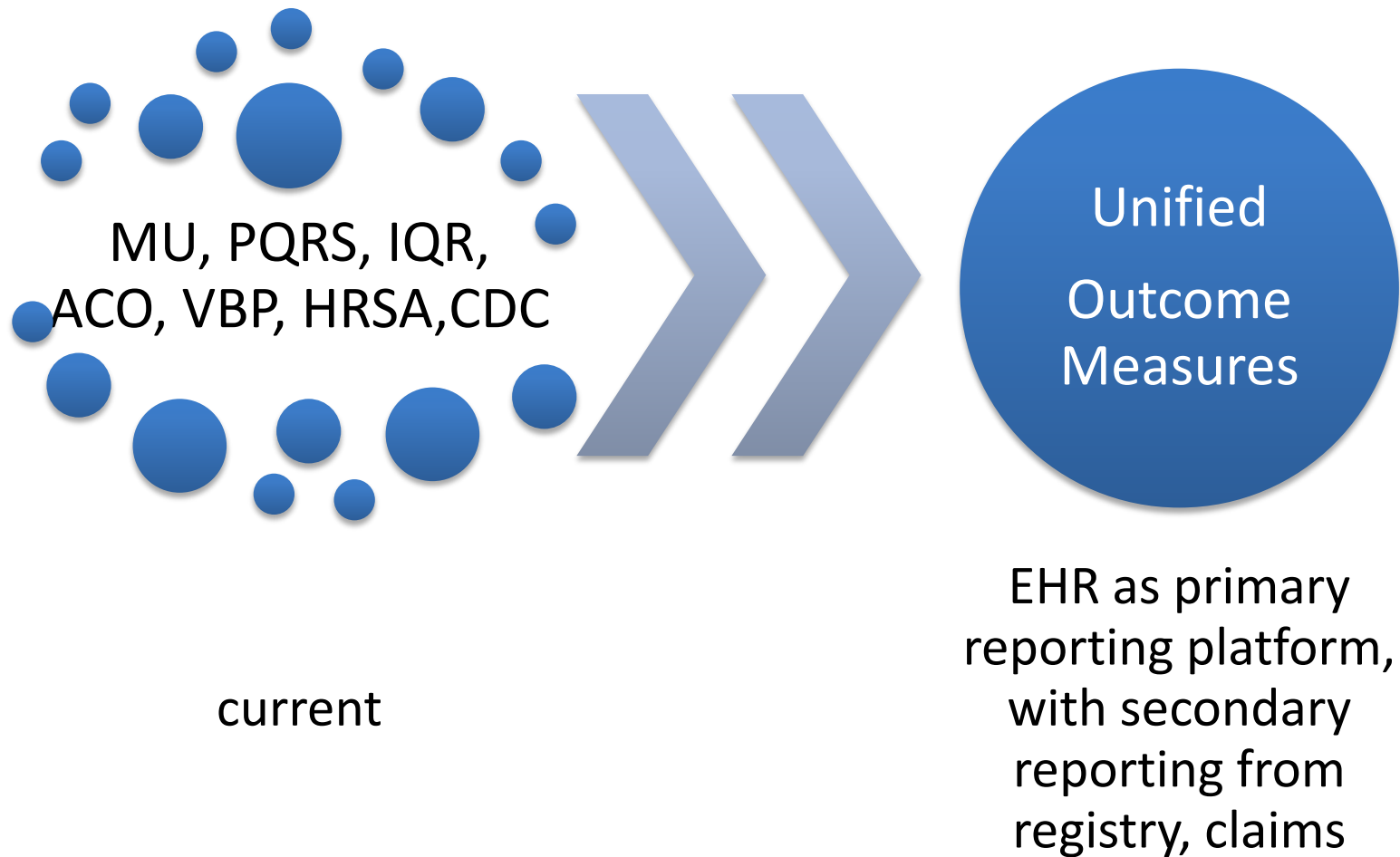
2015 Edition Difference

- For all CQM criteria – comment solicitation on the versions of standards to adopt

- User "on demand" ability to export data

- User "on demand" ability to import data; "closed" systems must demonstrate import capability; intent to test import of larger # of test records

Why Does Cypress Certify to the Base Standard?

- ONC has from the beginning of the program envisioned a certification program that can be flexible in testing to meet the needs of different products and sites

- For that reason, certification testing is agnostic generally to program requirements

- Increasingly, though ONC has had requests for making program requirements part of certification requirements
  - The Cypress Validation tools allow optional testing for the CMS program IG requirements

CMS has a variety of quality reporting and performance programs

Hospital Quality	Physician Quality Reporting	PAC and Other Setting Quality Reporting	Payment Model Reporting	"Population" Quality Reporting
• Medicare and Medicaid EHR Incentive Program • PPS-Exempt Cancer Hospitals • Inpatient Psychiatric Facilities • Inpatient Quality Reporting • HAC reduction program • Readmission reduction program • Outpatient Quality Reporting • Ambulatory Surgical Centers	• Medicare and Medicaid EHR Incentive Program • PQRS • eRx quality reporting	• Inpatient Rehabilitation Facility • Nursing Home Compare Measures • LTCH Quality Reporting • Hospice Quality Reporting • Home Health Quality Reporting	• Medicare Shared Savings Program • Hospital Value-based Purchasing • Physician Feedback/ Value-based Modifier* • ESRD QIP	• Medicaid Adult Quality Reporting* • CHIPRA Quality Reporting* • Health Insurance Exchange Quality Reporting* • Medicare Part C* • Medicare Part D*

* Denotes that the program did not meet the statutory inclusion criteria for pre-rulemaking, but was included to foster alignment of program measures.

HHS Measurement Alignment

MU, PQRS, IQR, ACO, VBP, HRSA,CDC

Unified Outcome Measures

current

EHR as primary reporting platform, with secondary reporting from registry, claims

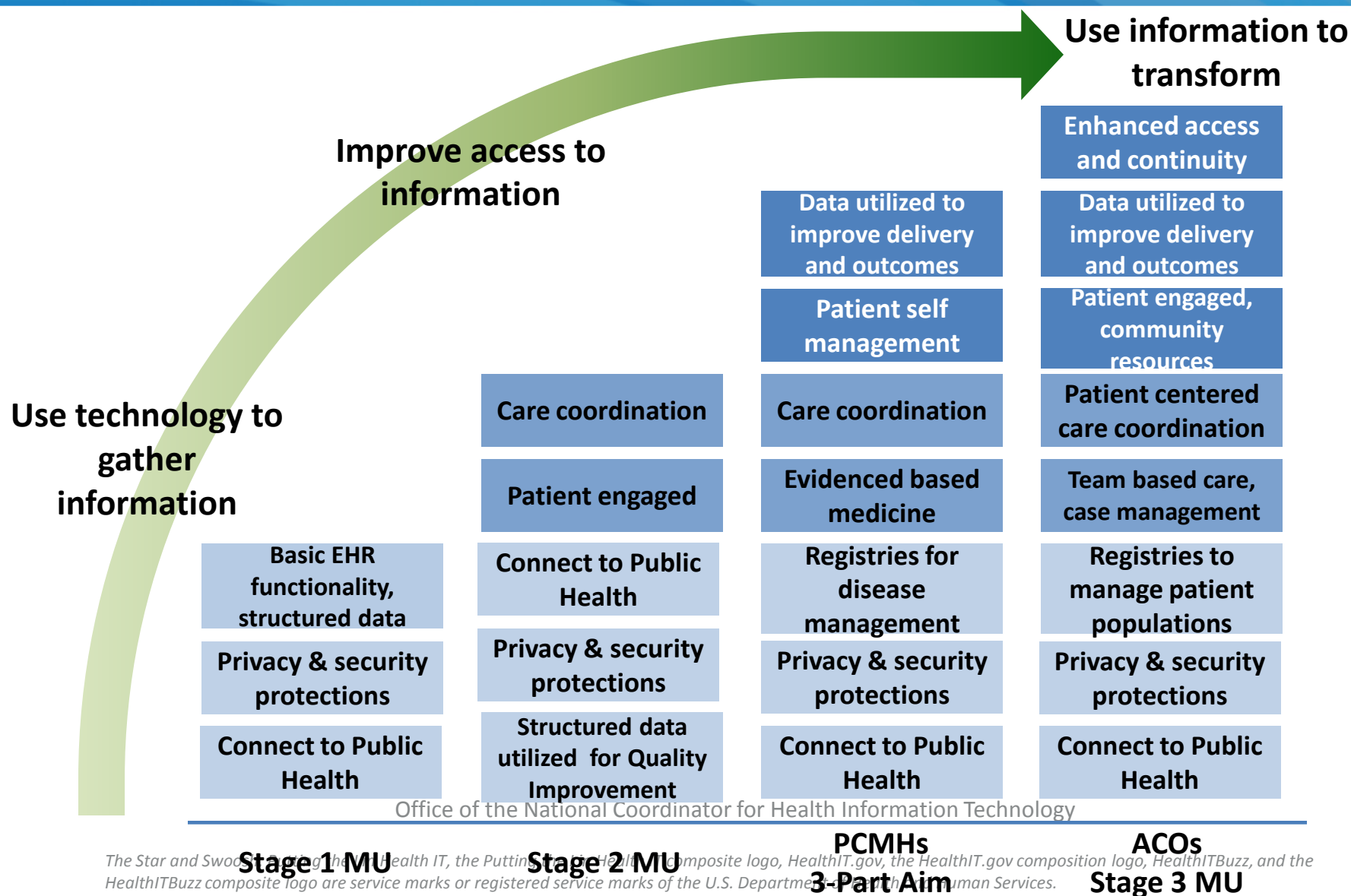# MACRA: Medicare Access and CHIP Reauthorization Act of 2015

Beginning in 2019, all current Medicare payment, including incentive programs, will be combined into one Merit-Based Incentive Payment System (MIPS), **replacing all Medicare reimbursement for eligible professionals.**

The MIPS program will use four performance measures to determine reimbursement, which will begin in 2019:

- Quality;
- Resource use;
- Clinical practice improvement activities; and
- Meaningful use of certified EHR technology.

- **Nationwide interoperability is a requirement by December 31, 2018**

Meaningful Use is a Building Block

Use information to transform

Improve access to information

Use technology to gather information

			Enhanced access and continuity
		Data utilized to improve delivery and outcomes	Data utilized to improve delivery and outcomes
		Patient self management	Patient engaged, community resources
	Care coordination	Care coordination	Patient centered care coordination
	Patient engaged	Evidenced based medicine	Team based care, case management
Basic EHR functionality, structured data	Connect to Public Health	Registries for disease management	Registries to manage patient populations
Privacy & security protections	Privacy & security protections	Privacy & security protections	Privacy & security protections
Connect to Public Health	Structured data utilized for Quality Improvement	Connect to Public Health	Connect to Public Health
Stage 1 MU	**Stage 2 MU**	**PCMHs** **3-Part Aim**	**ACOs** **Stage 3 MU**

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Future Certification Testing Options

- HHS has many programs that are transitioning towards electronic reporting requirements or options

- ONC hopes to support modularity for the specific needs of sites/programs moving forward

- Ideally, requirements that are common across sites and programs could migrate into the base

- In the future, ONC or others could allow or require modular additional certification to program requirements

Feedback on Cypress Testing, eCQM Issues and Certification

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Certification

	Project	Key	Project Lead
	2014 Edition Release Two Criteria	ERTWO	Christopher Watson
	Cancer Registry Implementation Guide Test Tool	CRIGTT	Matthew Rahn
	CYPRESS Issue Tracker	CYPRESS	Jean Colbert
	Direct Certificate Discovery Tool	DCDT	Matthew Tiller
	MU2 Cross Vendor Exchange	MCVE	Carmelita Marshall
	Office of Certification	CERT	Asara Clark
	ONC Health IT Certification Program 2015	CRTFIFTEEN	Christopher Watson

Quality-Measures

	Project	Key
🚀	BONNIE Issue Tracker	BONNIE
🌐	C-CDA Issue Tracker	CCDA
🚀	CDS Issue Tracker	CDS
🚀	Comments on eCQMs under development	PCQM
🚀	Core Clinical Data Elements Electronic Specifications - Public Comments	CCDEESPC
🚀	CQM Issue Tracker	CQM
🚀	QDM Issue Tracker	QDM
🚀	QRDA Issue Tracker	QRDA

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CYPRESS Issue Tracker / CYPRESS-538

Unusual Error When File Has Extra Data

✏️ Edit | 💬 Comment | Assign | More ▾ | Reopen | Admin ▾

Details

Type:	ⓘ Logic affecting more than 1 eCQM	Status:	👤 Closed (View Workflow)
Priority:	↓ Minor	Resolution:	Delivered
Labels:	cypress		
Institution/Name:	Epic		

Description

When testing QRDA-I files with Cypress 2.6.0, we are getting an unusual error when submitting a file with data from other measures than the one being tested. See the attachment for what we are seeing. The error message text mentions it is a warning but it shows up under the Error tab.

Is it truly meant to be an error if there is extra data in the XML or is this more of a warning as the message text seems to indicate?

Attachments

> 🗄 08.zip   32 kB   13/Mar/15 11:56 AM

People

Assignee:	👤 David Czulada
	Assign to me
Reporter:	👤 Ryan Knepp
Votes:	⓪ Vote for this issue
Watchers:	⑥ Start watching this

Dates

Created:	12/Mar/15 5:37 PM
Updated:	24/Jul/15 10:23 AM
Resolved:	24/Jul/15 10:23 AM
Comment Posted On:	24/Jul/15 10:18 AM

Agile

View on Board

Cypress Feedback Venues

- Cypress Tech Talks: Second and Fourth Tuesday of each month, 1pm EST
  - Register at https://attendee.gotowebinar.com/register/4320153072701235201

- Completed Webinars will be posted on the Cypress Website on the Timeline Tab.
  - http://projectcypress.org/timeline.html

- Send questions and feedback to the Cypress Talk List as talk@projectcypress.org
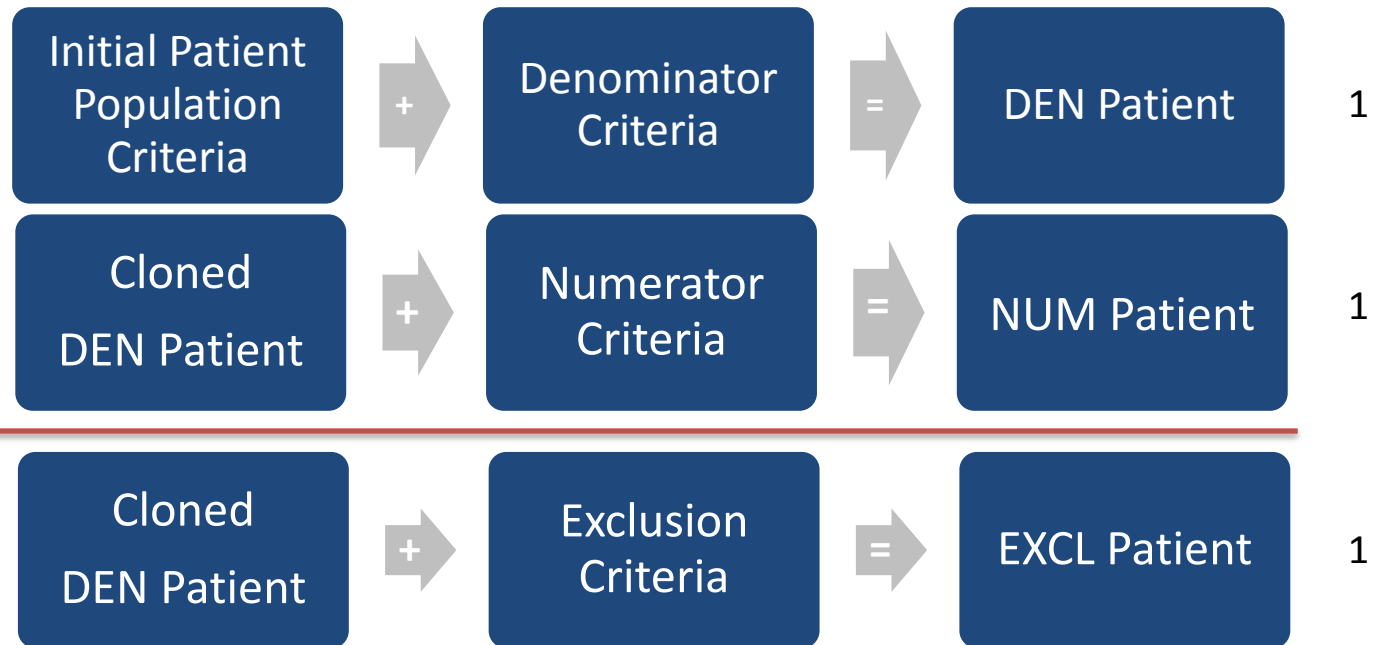
Test Deck Creation:
The Current and Future States

- **Two Decks**

  1. Eligible Professional (EP) CQM Certification Test Deck

  2. Eligible Hospital (EH) CQM Certification Test Deck

- **Three Driving Criteria**

  - Test at least 1 DEN and 1 NUM pathway for each measure

    - Patients target only one numerator but may bleed over to others

  - Test a portion of the Exclusion/Exception logic in Core CQMs

    - Exclusion/Exception coverage focused on *Recommended Core* EP CQMs

  - Constrained by need to **minimize vendor manual data entry** burden, but a scalable solution to support automatic input in the future

Basic Measure Pathways Targeted per CQM

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Initial Patient Population Criteria	+	Denominator Criteria	=	DEN Patient	1
Cloned DEN Patient	+	Numerator Criteria	=	NUM Patient	1
Cloned DEN Patient	+	Exclusion Criteria	=	EXCL Patient	1

* Currently today, this layer is supported in selective measures only

1

3

This approach meets the first two criteria that needed to be met.

Start Bucketing Patients

- **Inpatient vs. Outpatient (e.g. EH vs. EP)**

- **Patient Age (e.g. Newborn, Adult, Elderly)**

- **Gender (e.g. Female)**

- **Service Area or Diagnosis:**

EP

- Behavioral Health
- Cancer
- Dental
- Diabetes
- Eye
- General Practice
- HIV
- Heart Conditions
- Pregnancy

EH

- AMI
- Asthma
- Pneumonia
- Newborn
- Obstetric
- SCIP
- Stroke
- VTE

Logic for NQF 0438/CMS 72
Antithrombotic Therapy By End of Hospital Day 2

Cypress Patient Data

- **Initial Patient Population =** <Identify all relevant Episodes of care to be scored>
  - AND: "Patient Characteristic Birthdate: birth date" >= 18 year(s) starts before start of "Occurrence A of Encounter, Performed: Inpatient Encounter" **<Patient Age>**
  - AND: "Occurrence A of Encounter, Performed: Inpatient Encounter (length of stay <= 120 day(s))" **<Length of Stay>**
  - AND: "Occurrence A of Encounter, Performed: Inpatient Encounter (discharge datetime)" during "Measurement Period" **<Discharge during measurement period>**
  - AND: **<Principal Diagnosis of Ischemic or Hemorrhagic Stroke starts during Episode of care>**
    - OR: "Diagnosis, Active: Ischemic Stroke (ordinality: 'Principal Diagnosis')"
    - OR: "Diagnosis, Active: Hemorrhagic Stroke (ordinality: 'Principal Diagnosis')"
    - starts during "Occurrence A of Encounter, Performed: Inpatient Encounter"
- **Denominator =** <Filter episodes of care to include Ischemic Stroke only>
  - AND: "Initial Patient Population"
  - AND: "Diagnosis, Active: Ischemic Stroke (ordinality: 'Principal Diagnosis')" starts during "Occurrence A of Encounter, Performed: Inpatient Encounter" **<Principal Diagnosis of Ischemic starts during Episode of care>**

- Patient is **79 years old**
- Patient admitted as an **Inpatient**
- Patient diagnosed with **ischemic stroke**
- Ischemic Stroke diagnosis **is during** Inpatient visit

Leverage Common Data Elements

Measures

- **Antithrombotic Therapy By End of Hospital Day 2**

- **Discharged on Antithrombotic Therapy**

- **Stroke Education**

- **Assessed for Rehabilitation**

- **Anticoagulation Therapy for Atrial Fibrillation/Flutter**

- **Discharged on Statin Medication**

- **Thrombolytic Therapy**

Cypress Test Data

- **Patient is > 18 years old**
- **Patient has an inpatient encounter**
- **Patient has a stroke diagnosis during encounter**

- **Patient has an A Fib diagnosis**

- **Patient has an LDL test**

- **Patient has an ED visit**
- **Patient has stroke symptoms**

Adult DENOMINATOR Stroke

- EP

  - 36 patients for 64 measures

- EH

  - 20 patients for 29 measures

  - EH measures have less overlap in the populations than the EP measures

  - Mostly due to specific timings of treatment or presence (or lack of) specific diagnosis in IPP

Leveraging common data elements addresses the vendor data entry constraint by reducing the number of patients and data entry needs

What is the "Bleed Over" Affect?

- Definition: Unintended (but accurate) measure results beyond the original targeted measures

- For example, the stroke denominator patient previously described was designed to hit the stroke measures, however there is a bleed over affect as it touches the following two (non-stroke) measures as well:

  - **IPP of NQF 0453 (urinary catheter**) due to the IPP of this measure being broad (patient age > 18 years old and inpatient encounter)

  - **EXCL of NQF 0371 (VTE prophylaxis)** due to the rationale of the measure does not want to include patients with a stroke diagnosis

- Current test cases are created using BONNIE testing tool
- In Cypress v3, the "bleed over" effect may be a moot point as the testing procedures move to single measure testing
- Some test cases may be synthetic data generated through random test cases
- That should lead to different test cases for different products and vendors

Innovative QA and testing tools:
BONNIE: https://bonnie.healthit.gov/

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BONNIE

Measures   Account   Logout

≣ **0435:** Discharged on Antithrombotic Therapy

Description:
Ischemic stroke patients prescribed antithrombotic therapy at hospital discharge ⚙

✔**Initial Patient Population:**
- ✔ AND : ✔ Patient Characteristic Birthdate: birth date >= 18 years starts before start of ✔ Occurrence A: Encounter, Performed: Inpatient Encounter
- ✔ AND : ✔ Occurrence A: Encounter, Performed: Inpatient Encounter (Length of Stay <= 120 days)
- ✔ AND : ✔ Occurrence A: Encounter, Performed: Inpatient Encounter (Discharge Date/Time) during "Measurement Period"
- ✔ AND :
  - ✔ OR : ✖ Diagnosis, Active: Hemorrhagic Stroke (Ordinal : Principal Diagnosis) starts during ✔ Occurrence A: Encounter, Performed: Inpatient Encounter
  - ✔ OR : ✔ Diagnosis, Active: Ischemic Stroke (Ordinal : Principal Diagnosis) starts during ✔ Occurrence A: Encounter, Performed: Inpatient Encounter

✔**Denominator: None**
✔**Numerator:**
- ✔ AND : ✔ Medication, Discharge: Antithrombotic Therapy during ✔ Occurrence A: Encounter, Performed: Inpatient Encounter

✖**Denominator Exceptions:**
- ✖ AND :
  - ✖ OR : ✖ Medication, Order: Antithrombotic Therapy (Not Done: Medical Reason) starts during Occurrence A: Encounter, Performed: Inpatient Encounter
  - ✖ OR : ✖ Medication, Order: Antithrombotic Therapy (Not Done: Patient Refusal) starts during Occurrence A: Encounter, Performed: Inpatient Encounter

✖**Denominator Exclusions:**
- ✖ AND :
  - ✖ OR : ✖ Occurrence A: Encounter, Performed: Inpatient Encounter (Reason : Carotid Intervention)
  - ✖ OR : ✖ Occurrence A: Encounter, Performed: Inpatient Encounter (Discharge Status : Discharge To Another Hospital)
  - ✖ OR : ✖ Occurrence A: Encounter, Performed: Inpatient Encounter (Discharge Status : Left Against Medical Advice)
  - ✖ OR : ✖ Occurrence A: Encounter, Performed: Inpatient Encounter (Discharge Status :

TEST PATIENTS

67   FAIL   2 /3   👤+

Total Coverage: 21%

✖	👤	Hemorrhagic No Meds	FAIL
✔	👤	Ischemic No Meds	PASS
✔	👤	Ischemic With Meds	PASS

	Population	Expected	Actual
✔	IPP	1	1
✔	DENOM	1	1
✔	NUMER	1	1
✔	DENEXCEP	0	0
✔	DENEX	0	0

EDIT   CLONE   ⊖

Cypress v3:
The Next Generation

CYPRESS Future Considerations

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Cypress V3: Will provide 2015 Certification Edition testing

- Will incorporate automated test case consumption
  - What formats and numbers of test files?
  - What manual test deck entry, if any, would be required?
- Will include higher level of conformance testing
  - What kind of negative testing can be included?
  - What kind of "smoking gun" testing is most appropriate?

CYPRESS Future Considerations

Cypress V3: Will provide 2015 Certification Edition testing

- Planned to perform single measure testing
- Could offer customized test cases:
  - Randomized content unique to a test
  - Allow customization by vendors to request specific codesets/vocabularies for testing
- Could offer additional formats of test cases
- Could test every path through each measure
- Could allow vendor test file submissions for pre-release testing

We value your input!

Tell us what you think could:

- Reduce certification and testing cost

- Improve first-pass success with certification and lead to improved CMS submission success

- Improve test reliability and data quality

Questions and Feedback

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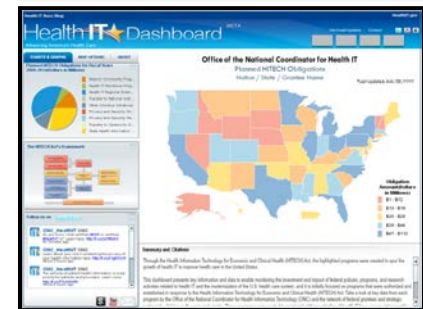
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Proposed EHR Incentive Programs Stage 3 Meaningful Use Objectives

- **Objective 1:** Protect Patient Health Information
- **Objective 2:** Electronic Prescribing
- **Objective 3:** Clinical Decision Support
- **Objective 4:** Computerized Provider Order Entry
- **Objective 5:** Patient Electronic Access to Health Information
- **Objective 6:** Coordination of Care through Patient Engagement
- **Objective 7:** Health Information Exchange
- **Objective 8:** Public Health and Clinical Data Registry Reporting

"New" Certification Criteria for Stage 3 (continued)

Proposed Criterion	Proposed Functionality and Standards
• Consolidated CDA Creation Performance	• Create a data file in accordance with C-CDA Release 1.1 and Release 2.0 that matches a gold-standard, reference file • Must be able to create document templates (CCD, Consultation Note, History and Physical, Progress Note, Care Plan, Transfer Summary, Referral Note, and (inpatient only) Discharge Summary) • Must conform to vocabulary standards and value sets adopted in C-CDA Releases 1.1 and 2.0