

Cypress User Guide Version 7.1

An Open Source Electronic Clinical Quality Measure Testing and Certification Tool



Prepared for:

Centers for Medicare & Medicaid Services and Assistant Secretary for Technology Policy/The Office of the National Coordinator for Health Information Technology

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Introduction

1.1 Background

Cypress™ v7 is the rigorous and repeatable testing tool of Health Information Technology (IT) Modules used in calculating Electronic Clinical Quality Measures (eCQM). Cypress v7 is the official testing tool for the ONC Health IT Certification Program supported by the Assistant Secretary for Technology Policy/Office of the National Coordinator for Health IT (ASTP/ONC). The ONC Health IT Certification Program includes certification criteria to support electronic clinical quality measurement and reporting across the healthcare ecosystem. The ONC Health IT Certification Program criteria also support the requirements of the Centers for Medicare & Medicaid Services (CMS) Promoting Interoperability Program and other CMS program requirements.

1.2 Audience

ASTP and CMS developed the Cypress User Guide for test proctors who test and certify Health IT Modules at Authorized Testing Labs (ATL). Health IT software engineers, quality assurance engineers, and production release engineers may draw on the guide when they use Cypress in a pre-testing mode to understand how their Health IT Module will perform in an ATL-conducted operational test.

1.3 Approach

This guide provides instructions on how to use the open source Cypress v7 tool (it is assumed the user has downloaded the software). It addresses the requirements and steps for testing Health IT Modules for calculating and reporting eCQMs.

The Cypress tool is freely available for use or adoption by the health IT community, including Health IT developers and testing labs. The open source project website at [Project Cypress](#) provides information detailing the set up and configuration of Cypress v7 open source software.

2 Cypress Testing Capabilities

To achieve certification, each Health IT Module must show that it meets four criteria by demonstrating required capabilities specified in the regulation and described in the following subsections. The Cypress v7 software verifies four eCQM capabilities for Health IT certification (Capture/Record and Export, Import and Calculate, Electronic Submission, and Data Filtering), as described in the following subsections.

2.1 Capture/Record and Export

Cypress v7 supports the requirements for Capture/Record and Export capabilities as follows:

- **Capture/Record** – To be certified in accordance with 45 CFR §170.315(c), the technology must be able to electronically capture/record all the data identified in the specified procedure necessary to calculate each eCQM. Data required for eCQM exclusions or exceptions must be codified entries. These entries may include specific terms as defined by each eCQM, or may include codified expressions, such as “patient reason,” “system reason,” or “medical reason.”

- **Export** – As provided in 45 CFR §170.315(c)(1), the technology must be able to electronically export a data file formatted in accordance with the Quality Reporting Document Architecture (QRDA) Category I standard that includes all the data captured for every eCQM for which the technology is being certified.

The functionality requirement for Capture/Record and Export specifies that a system user can record and export individual, patient-level eCQM data formatted to the Health Level Seven International (HL7) QRDA Category I Release 5.3 Implementation Guide (IG) at any time the user chooses, for one or multiple patients, without needing developer support. The requirement for Capture/Export is part of the certification criteria necessary to satisfy the Base EHR definition. The capability to export eCQM data serves two purposes: (1) a provider or health system can view and verify their eCQM results for quality improvement on a near real-time basis, and (2) providers can export their results to multiple programs, such as those run by CMS, states, and private payers.

Figure 1 depicts the basic concept for Capture/Record and Export. The primary purpose of this step is to verify the technology's ability to export data in the proper QRDA Category I format with the proper Quality Data Model (QDM) data elements.

To verify this capability, Cypress produces static patient data for each of the eCQMs that are to be tested and exports the relevant patients. This data is entered into the technology. The technology is then commanded to export the patient test data as a set of QRDA Category I files that contain the proper elements from the QDM for calculating the eCQMs under test. These QRDA files are loaded back into Cypress where they are tested for validity, determining valid QRDA Category I Extensible Markup Language (XML) documents, and correctness, containing only the elements required to calculate the eCQMs.

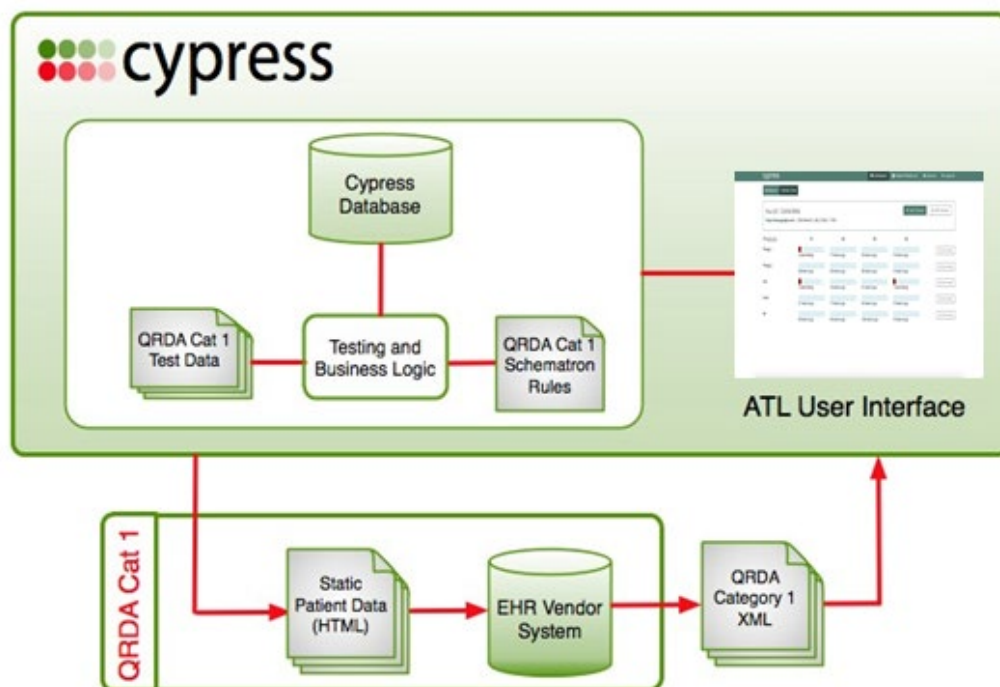


Figure 1. Capture/Record and Export

2.2 Import and Calculate

Cypress v7 supports the requirements for Import and Calculate capabilities as follows:

- **Import** – The technology must be able to electronically import a data file formatted in the QRDA Category I format.
- **Calculate** – The technology must be able to electronically calculate every clinical quality measure for which it is presented for certification.

A Health IT Module must be capable of demonstrating that it can import data to warrant certification against this criterion using the QRDA Category I IG, even if the module is also certified to provide “capture/record and export” and “report” functions.^a The requirement ensures that users of certified Health IT can import eCQM data formatted to the QRDA Category I standard for one or more patients without needing to request developer support.

2.3 Electronic Submission

Cypress v7 supports the requirements for Electronic Submission capabilities as follows:

- Electronic Submission enables a user to electronically create a data file in QRDA format for transmission of clinical quality measurement data that can be electronically accepted by CMS.

Figure 2 shows the basic concept for Import, Calculate, and Electronic Submission. These steps provide for automated verification that a Health IT Module can:

- Import and calculate the eCQM results for the quality measures being certified based on the synthetic patient data that Cypress presents to the technology under test
- Generate a properly formatted summary eCQM report that could be electronically submitted using QRDA Category III format

^a From Federal Regulation (80 FR 62650-62651): “First, this functionality could streamline the testing and certification process by importing QRDA Category I files rather than systems needing to manually enter test patient data. Second, the import functionality can promote quality improvement and data sharing between systems by providing systems the ability to import CQM data from other systems in a standardized format.”

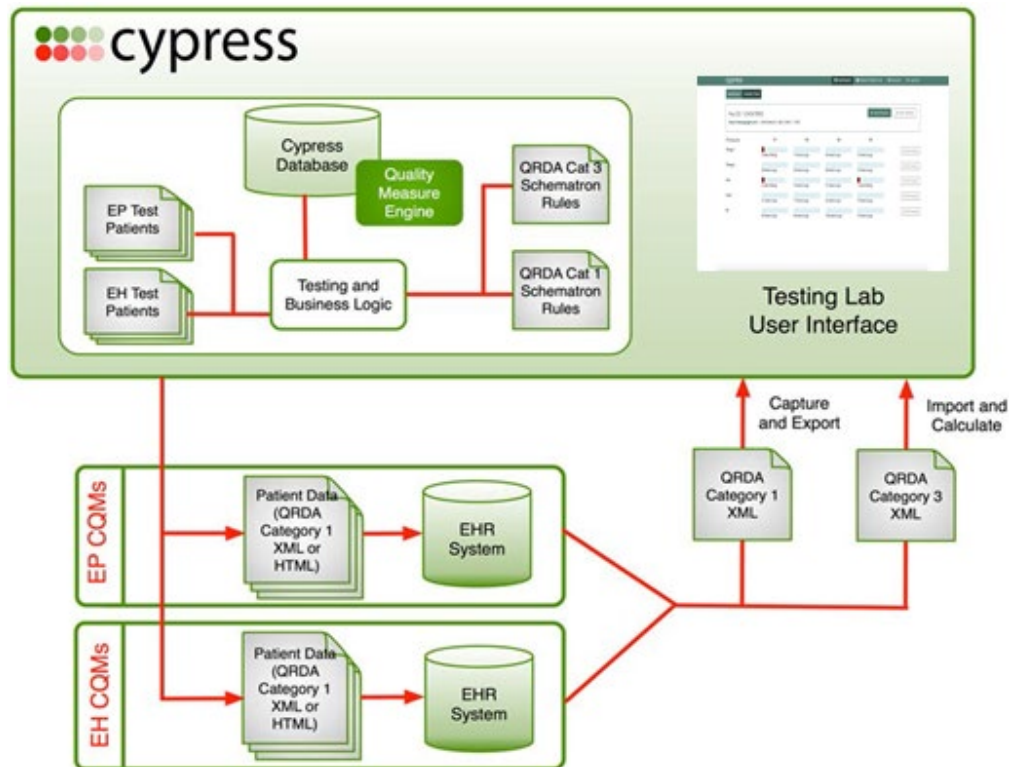


Figure 2. Import, Calculate, and Electronic Submission

2.4 Data Filtering

Cypress v7 supports the requirements for Data Filtering capabilities as follows:

- The technology must be able to record data (according to specified standards, where applicable) and filter eCQM results at both patient and aggregate levels.

Filtering individual patient-level and aggregate-level eCQM results by data supports administrative reporting as well as identification of health disparities and gaps in care for patients treated at specific group practice sites or in a given Accountable Care Organization (ACO).

3 Detailed Description of Cypress Workflow

Figure 3 illustrates the general workflow of a test performed with the Cypress open source software tool and a description of how the test procedure is organized and conducted. As shown in Figure 3, the vendor interacts with the vendor system. An ATL test proctor interacts with the Cypress web interface. The test proctor downloads test data from Cypress, which is then sent from Cypress and entered into the vendor system. The vendor returns test results to Cypress, which generates reports reflecting assessment of certification testing.

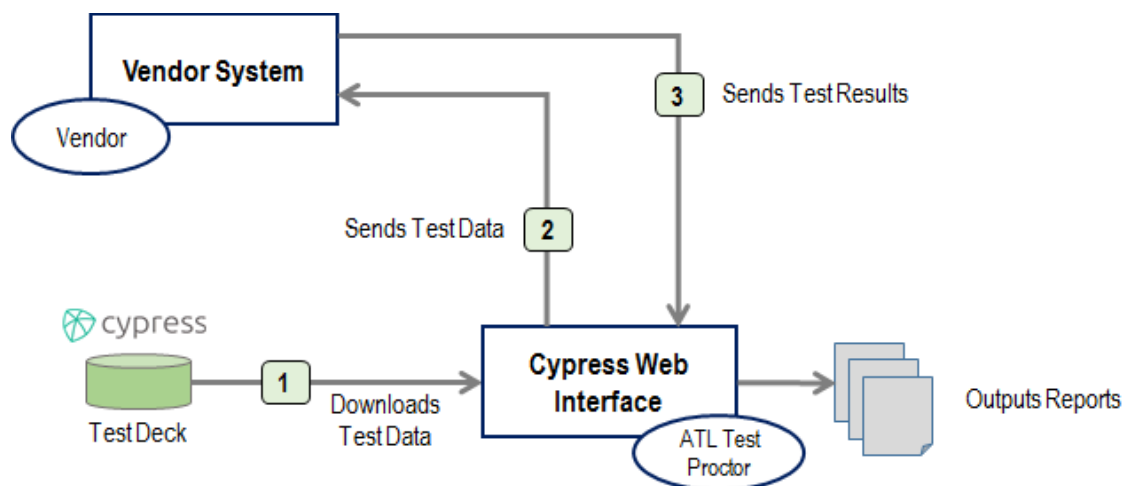


Figure 3. Cypress Workflow in an Authorized Testing Lab

Cypress can perform the following types of tests in support of eCQM certification:

1. XML Data conformance testing of the QRDA Category I standard for individual patient-level data used for eCQM calculation
2. XML Data conformance testing of the QRDA Category III standard for aggregate reporting of eCQM calculation
3. Accuracy calculation testing of the Eligible Clinician eQMs
4. Accuracy calculation testing of the Hospital – Inpatient and Outpatient eQMs

The Cypress website provides a complete description of the Cypress Testing Procedure (available at <http://healthit.gov/cypress/resources.html>).

The following subsections present a detailed description of Cypress v7, from accessing Cypress, overview of administrative functions, preparation for testing, test execution, exit success criteria, and submission to verification.

3.1 Accessing Cypress

To access and download the Cypress Software, go to [Project Cypress](#):

- The Project Cypress site provides several options and detailed instructions for downloading and installing the Cypress software. If the software has not been installed, please follow the Cypress Download Instructions located on the Project Cypress site. This User Guide does not provide instructions for downloading the Cypress software.

After Cypress is downloaded and installed, it is accessible via a URL, bookmark, or icon you created as part of the download/installation process.

Upon accessing the installed instance of Cypress, the Sign In screen should appear. Figure 4 presents a screenshot of the “Sign In” screen. To create an account, select **Sign Up**.

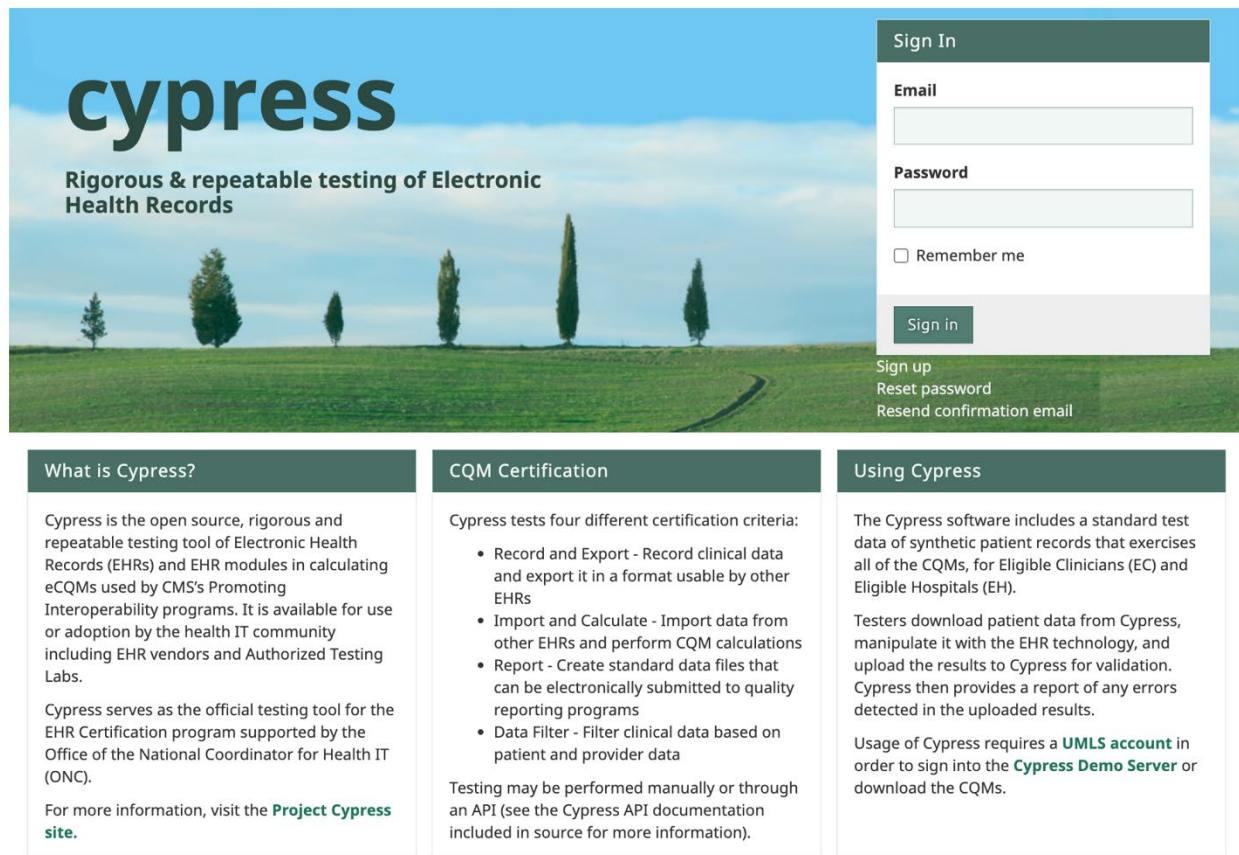


Figure 4. Cypress Sign In Page

- If you have previously set up an account, enter your email and password, and select **Sign In**.
- If you have previously created an account and forgotten your password, select **Reset password**. In the **Forgot your Password?** screen, enter the email address associated with your Cypress account, and select **Send me reset password instructions**. You will be sent a link to reset your password.
- **Sign Up** will bring you to the Sign Up and Terms and Conditions page. Click on the **Terms and Conditions** link on that page. Figure 5 presents a screenshot of the Terms and Conditions page.

Terms and Conditions for use of Cypress

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Back

Figure 5. Cypress Terms and Conditions Page

- To **Sign up**, enter your Email, a Password, and then confirm that Password.
- Read the Terms and Conditions, check **I agree to the above Terms and Conditions**, and select **Sign up** to create your Cypress Account as shown in the screenshot of the Cypress Account creation page (Figure 6).

Sign Up

Email

Password

8 characters minimum and include at least 3 of the following: lowercase letters, uppercase letters, digits, and special characters.

Confirm Password

Terms and Conditions

☐ I agree to the above Terms and Conditions

Sign up

Sign in

Resend confirmation email

Figure 6. Cypress Account Creation

3.2 Overview of Administrative Functions

Cypress displays the **Dashboard** after you create your account, as shown in Figure 7.

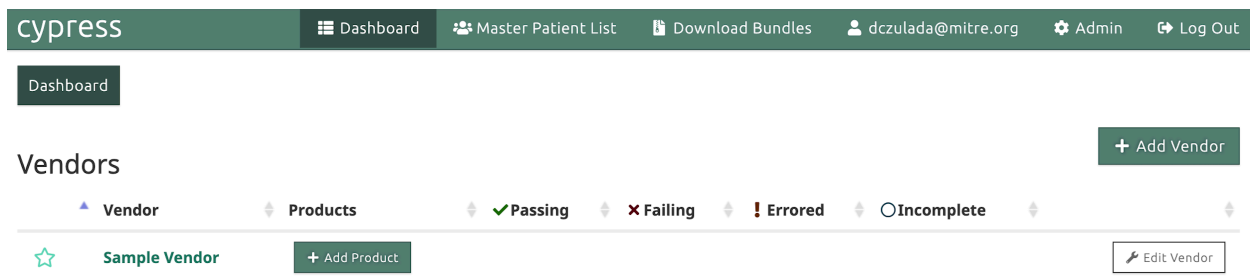


Figure 7. Cypress Dashboard

The Dashboard includes the following Cypress Administrative Functions:

1. Master Patient List – Provides a list of all test data for eQMs
2. Account – Update a Cypress Account Password
3. Log Out – Log out of the Cypress Application
4. Add Vendor – Add vendor by entering Health IT Vendor contact and product information (please refer to “Cypress v7 Preparation for Testing,” subsection 4.3)
5. Edit Vendor – Edit Health IT Vendor contact and product information (please refer to “Cypress v7 Preparation for Testing,” subsection 4.3)

3.2.1 Master Patient List

Figure 8 presents the Master Patient List page that provides a list of all test data for eQMs for calendar year 2021 reporting.

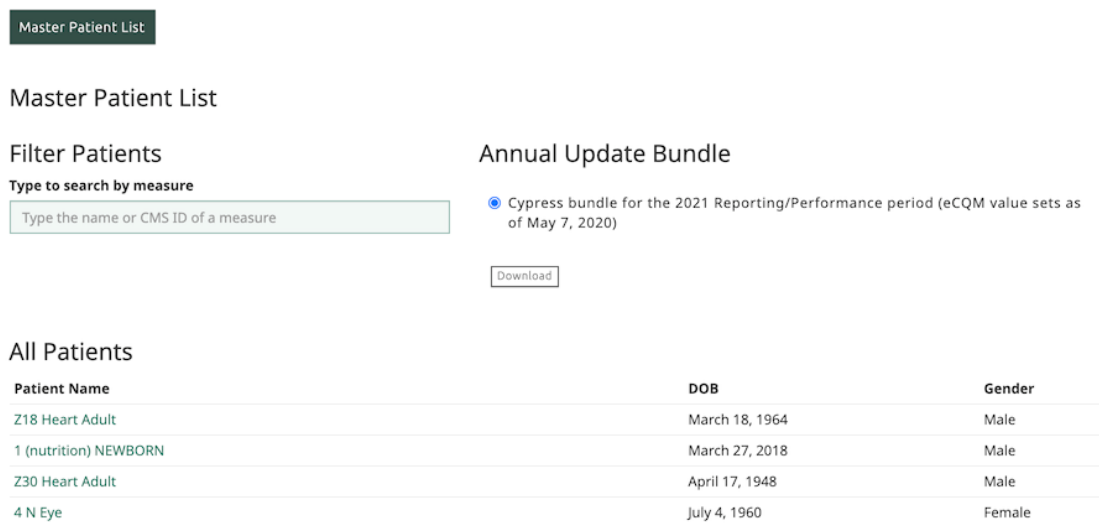


Figure 8. Master Patient List of Test Patients

By selecting the **Filter by Measure** drop-down, you can select a specific measure from a list of patient records that apply to a specific eCQM and eCQM qualifiers. Figure 9 presents an example screenshot of filtering by the measure, CMS2v10 Preventive Care and Screening: Screening for Clinical Depression and Follow-Up Plan Patients.

Master Patient List

Master Patient List

Filter Patients

Type to search by measure

CMS2

Annual Update Bundle

☒ Cypress bundle for the 2021 Reporting/Performance period (eCQM value sets as of May 7, 2020)

Download

CMS2v10 - PopulationSet 1 Patients

Patient Name	DOB	Gender	IPOP	DENOM	NUMER	DENEX	DENEXCEP
Z18 Heart Adult	March 18, 1964	Male					
Z30 Heart Adult	April 17, 1948	Male					
Z4 N Eye	February 28, 1973	Male					
Z12 GP Geriatric	May 25, 1951	Female					
Z1 Diabetes Adult	February 1, 1958	Female					
Z9 (Age 2) Heart Adult	March 9, 1965	Female					

Figure 9. Patients Specific to CMS2v10 Preventive Care and Screening: Screening for Clinical Depression and Follow-Up Plan Patients

If you click on the patient's name in the patient record list, Cypress will display an individual patient record and their eCQM qualifiers as shown in Figure 10.

Measure Information

	IPOP	DENOM	NUMER	DENEX	DENEXCEP
CMS2v10 - PopulationSet 1	●	●	○	○	○
CMS22v9 - PopulationSet 1	4	4	○	○	○
CMS68v10 - PopulationSet 1	4	4	○	○	○
CMS69v9 - PopulationSet 1	●	●	○	○	○
CMS124v9 - PopulationSet 1	●	●	○	○	○
CMS125v9 - PopulationSet 1	●	●	●	○	○
CMS130v9 - PopulationSet 1	●	●	○	○	○
CMS138v9 - PopulationSet 1	●	●	○	○	○
CMS138v9 - PopulationSet 2	●	○	○	○	○
CMS138v9 - PopulationSet 3	●	●	○	○	○
CMS147v10 - PopulationSet 1	●	●	○	○	○
CMS249v3 - PopulationSet 1	●	●	○	○	○
CMS347v4 - PopulationSet 1	●	○	○	○	○
CMS347v4 - PopulationSet 2	●	○	○	○	○
CMS347v4 - PopulationSet 3	●	○	○	○	○
CMS349v3 - PopulationSet 1	●	●	○	○	○

Select Measure(s) ▼

Patient Data for All Measures

Cypress Certification Patient Test Record: A Cancer Female

Patient	A Cancer Female	Sex	
Date of birth		Date of expiration	
Race		Ethnicity	
Insurance Providers		Patient IDs	5ed6a68bc1c38840a9ae667e Cypress
Contact info			

QDM::Diagnosis
Unilateral Mastectomy, Unspecified Laterality
Codes:
SNOMEDCT: 22964006
ICD10CM: Z90.10
Time Elements:
Prevalence Period Start: 2018-04-29T13:00:00.000Z
Other Fields:
Anatomical Location Site: 419161000 (SNOMEDCT)

QDM::DiagnosticStudyPerformed
Mammography
Codes:
HCPCS: G0202
LOINC: 24606-6
Time Elements:
Relevant Date/Time: 2018-02-03T14:00:00.000+00:00
Other Fields:

QDM::EncounterPerformed
Office Visit
Codes:

Figure 10. Patient Test Record Data Requirements and eCQM Quaifiers

3.2.2 Account

If you have previously set up an account, this function allows you to change your Password or delete your account. Figure 11 presents a screenshot of the account password update and delete page.

The screenshot shows the Cypress web application interface. At the top, a dark green navigation bar contains the 'cypress' logo and links for 'Dashboard', 'Master Patient List', 'Account', and 'Log Out'. Below this, a dark green button labeled 'Edit Account' is visible. The main content area is titled 'Edit User' and contains a form with the following fields: 'Email' (pre-filled with 'rlhghapn@sharklasers.com'), 'Password' (with a note 'we need your current password to confirm your changes'), 'New Password' (with a note 'leave blank if you don't want to change it'), and 'Confirm New Password'. At the bottom of the form are 'Update' and 'Back' buttons. Below the form is a red-bordered section titled 'Delete Account' with the text 'Once you delete your account you cannot get it back. Be sure you want to do this.' and a 'Delete Account' button.

Figure 11. Account Password Update

3.2.3 Log Out

Figure 12 presents a screenshot of the Log Out function that allows a user to return to the Account Sign In (as shown in Figure 4).

The screenshot shows the Cypress web application interface. At the top, a dark green navigation bar contains the 'cypress' logo and links for 'Dashboard', 'Master Patient List', 'Download Bundles', 'dczulada@mitre.org', 'Admin', and 'Log Out'. The 'Log Out' button is highlighted with a red dashed border. Below this, a dark green button labeled 'Dashboard' is visible. The main content area is titled 'Vendors' and contains a table with columns for 'Vendor', 'Products', and status indicators (Passing, Failing, Errored, Incomplete). A 'Sample Vendor' is listed with a '+ Add Product' button. At the bottom right is an 'Edit Vendor' button.

Figure 12. Cypress Log Out

3.2.4 Add Vendor

The Add Vendor function allows the user to enter Health IT vendor contact and product information (as described in subsection 3.3, Cypress v7 Preparation for Testing) as shown in Figure 13.

Dashboard
Add Vendor

Add Vendor

Vendor Name

Vendor ID

URL

Address

State

Zip

Add Point of Contact

Add Vendor
Cancel

Figure 13. Add Vendor Page

3.2.5 Edit Vendor

The Edit Vendor function allows a user to edit Health IT Vendor contact and product information (as described in subsection 3.3, Cypress v7 Preparation for Testing) as shown in Figure 14.

Dashboard
Vendor: Sample Vendor
Edit Vendor

Save Changes: Sample Vendor

Vendor Name

Vendor ID

URL

Address

State

Zip

POC Name

Email

Telephone

Type of Contact

Remove

Add Point of Contact

Save Changes
Cancel

Delete Vendor

Removing a vendor will also delete all associated products, product tests, and test execution results. Be sure you want to do this.

Delete Vendor

Figure 14. Edit Vendor Page

3.3 Cypress v7 Preparation for Testing

Add Vendor Information

- Once you have created an account, you can begin testing by adding a Vendor and Contact Information.
- Select **Add Vendor** from the Dashboard as shown in Figure 15.

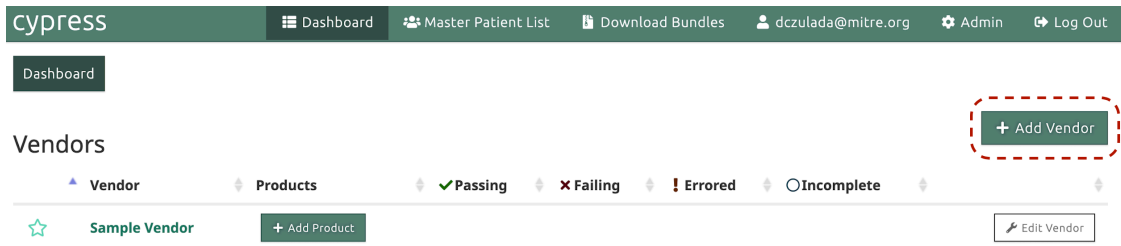


Figure 15. Dashboard Select Add Vendor

- After selecting **Add Vendor**, the **Create Vendor** information will be displayed as shown in Figure 16.
- Complete the fields listed under Create Vendor and select **Create Vendor**.

The screenshot shows the 'Add Vendor' form. At the top is a breadcrumb 'Dashboard > Add Vendor'. The form has a title bar 'Add Vendor'. Below the title bar are several input fields: 'Vendor Name' (containing 'Sample Vendor'), 'Vendor ID' (containing 'ID 2'), 'URL' (containing 'www.samplevendor.com'), 'Address' (containing '1287 enterprise way'), 'State' (containing 'DC'), and 'Zip' (containing '20013'). Below these fields are four input fields for contact information: 'POC Name' (containing 'John Doe'), 'Email' (containing 'johndoe@samplevendor.c'), 'Telephone' (containing '111-111-1111'), and 'Type of Contact' (containing 'Manager'). There is a 'Remove' button next to the 'Type of Contact' field. Below the contact fields is an 'Add Point of Contact' button. At the bottom of the form are two buttons: 'Add Vendor' (highlighted with a red dashed box) and 'Cancel'.

Figure 16. Create Vendor Page

Enter Product Information

- The next step is to enter Product Information. Begin by clicking the Vendor name displayed on the Dashboard as shown in Figure 17.

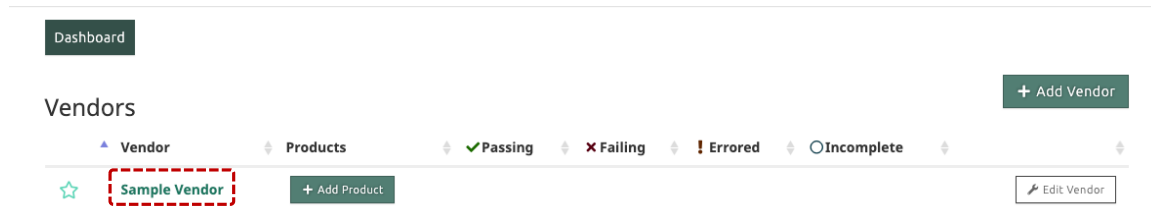


Figure 17. Dashboard with New Vendor Created

- Next, click Add Product, as shown in Figure 18, to begin entering vendor product information.

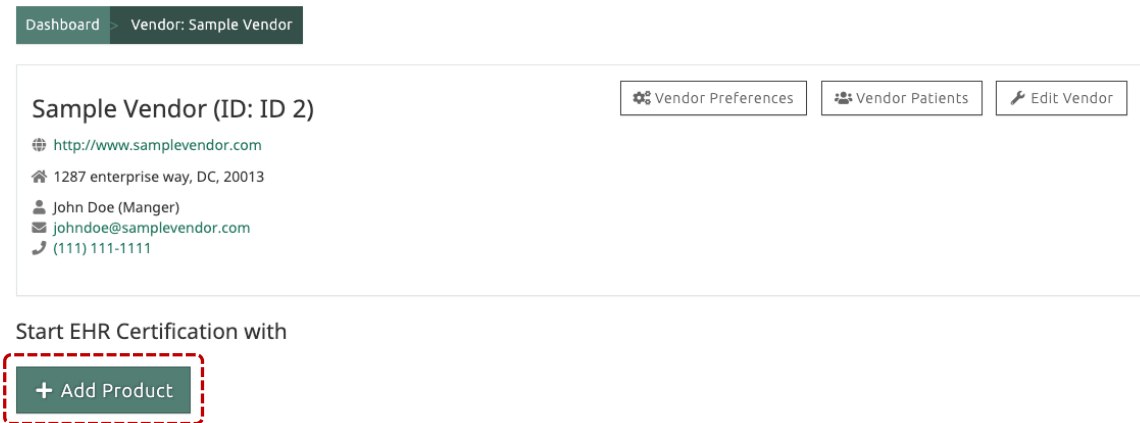


Figure 18. Vendor Product Information Page

- On the Vendor Add Product page, presented in Figure 19:
 - Enter Product information (Name, Version, and Description). Examples would be product version number, the name and version of any optional modules installed in the product at the time of the test, and the operating system.
 - For Certification Types, a product must, at a minimum, certify to either the C1 test or the C2 test. To indicate which tests are being certified, check the box selecting from the following options:
 - C1 Test – Record and Export
 - C2 Test – Import and Calculate
 - C3 Test – Data Submission
 - C4 Test – Data Filtering

- For Records Options, note that Randomize Records and Duplicate Records have already been pre-checked because these options are recommended for the most robust testing (although they can be unselected, if needed).
- For Bundle Options, you must select which of the following bundles of eCQMs you are certifying for:
 - ♦ Cypress bundle for the 2023 Reporting/Performance period (eCQM value sets as of May 5, 2022)
 - ♦ Cypress bundle for the 2024 Reporting/Performance period (eCQM value sets as of May 4, 2023)
 - ♦ Cypress bundle for the 2025 Reporting/Performance period (eCQM value sets as of May 2, 2024)
 - ♦ Cypress bundle for the 2026 Reporting/Performance period (eCQM value sets as of May 8, 2025)

Dashboard
Vendor: Sample Vendor
Add Product

Add Product

Name

Version

Description

Product Types

☒ Certification Product

☐ CVU+ Product

Certification Types

☐ C1 Test

☐ C2 Test

☐ C3 Test

☐ C4 Test

Select the certification type Cypress should use to certify this product

Records Options

☒ Randomize Records

☒ Duplicate Records

Recommended for most robust testing.

Bundle Options

☐ Cypress bundle for the 2024 Reporting/Performance period (eCQM value sets as of May 4, 2023) 2023.0.0

☐ Cypress bundle for the 2023 Reporting/Performance period (eCQM value sets as of May 5, 2022) 2022.1.1

☒ Cypress bundle for the 2025 Reporting/Performance period (eCQM value sets as of May 2, 2024) 2024.0.0

Select the measure versions Cypress should use to certify this product.

☐ Shift Records

Selecting Shift Records will move patient data forward into the appropriate reporting period. Otherwise patient data will remain in a previously completed calendar year.

Measures Options

☐ Eligible Hospital eCQMs (Including Pre-Rulemaking)

☐ Eligible Clinician eCQMs (Including Pre-Rulemaking)

☐ All eCQMs (Excluding Retried)

☐ Custom...

Indicate the clinical quality measures Cypress should use to certify this product. Testing will be performed on a measure-by-measure basis. Click 'Custom' to specify individual measures.

Add Product
Cancel

Figure 19. Vendor Add Product Page

- The Vendor Add Product page also has a section entitled “Measures Options” that must be completed before adding a product. For Measures Options, you must indicate the clinical quality measures (i.e., select one option) Cypress should use to certify this product, as shown in Figure 20. The options are:
 - Eligible Hospital eQMs
 - Eligible Clinician eQMs
 - All eQMs
 - Custom. Selecting “Custom” allows you to specify any individual measures Cypress should use to certify this product. Figure 21 presents a screenshot of the option for “Custom”.

Dashboard
Vendor: Sample Vendor
Add Product

Add Product

Name

Version

Description

Product Types

- ☒ Certification Product
- ☐ CVU+ Product

Certification Types

- ☒ C1 Test
- ☒ C2 Test
- ☒ C3 Test
- ☒ C4 Test

Select the certification type Cypress should use to certify this product

Records Options

- ☒ Randomize Records
- ☒ Duplicate Records

Recommended for most robust testing.

Bundle Options

- ☐ Cypress bundle for the 2024 Reporting/Performance period (eCQM value sets as of May 4, 2023) 2023.0.0
- ☒ Cypress bundle for the 2025 Reporting/Performance period (eCQM value sets as of May 2, 2024) 2024.0.0

Select the measure versions Cypress should use to certify this product.

☐ Shift Records

Selecting Shift Records will move patient data forward into the appropriate reporting period. Otherwise patient data will remain in a previously completed calendar year.

Measures Options

- ☒ Eligible Hospital eQMs (Including Program Candidate/Pre-Rulemaking)
- ☐ Eligible Clinician eQMs (Including Program Candidate/Pre-Rulemaking)
- ☐ All eQMs (Excluding Retried)
- ☐ Custom...

Indicate the clinical quality measures Cypress should use to certify this product. Testing will be performed on a measure-by-measure basis. Click 'Custom' to specify individual measures.

Add Product
Cancel

Figure 20. Eligible Hospital eQMs Measure Selection

Dashboard
Vendor: Sample Vendor
Add Product

Add Product

Name

Version

Description

Product Types

☒ Certification Product
☐ CVU+ Product

Certification Types

☒ C1 Test
☒ C2 Test
☒ C3 Test
☒ C4 Test

Select the certification type Cypress should use to certify this product

Records Options

☒ Randomize Records
☒ Duplicate Records

Recommended for most robust testing.

Bundle Options

☐ Cypress bundle for the 2024 Reporting/Performance period (eCQM value sets as of May 4, 2023) 2023.0.0
☐ Cypress bundle for the 2023 Reporting/Performance period (eCQM value sets as of May 5, 2022) 2022.1.1
☒ Cypress bundle for the 2025 Reporting/Performance period (eCQM value sets as of May 2, 2024) 2024.0.0

Select the measure versions Cypress should use to certify this product.

☐ Shift Records

Selecting Shift Records will move patient data forward into the appropriate reporting period. Otherwise patient data will remain in a previously completed calendar year.

Measures Options

☐ Eligible Hospital eQMs (Including Pre-Rulemaking)
☐ Eligible Clinician eQMs (Including Pre-Rulemaking)
☐ All eQMs (Excluding Retried)
☒ Custom...

Indicate the clinical quality measures Cypress should use to certify this product. Testing will be performed on a measure-by-measure basis. Click 'Custom' to specify individual measures.

Figure 21. Vendor Add Product, “Custom” Measures Option

- Please note that testing will be performed on a measure-by-measure basis.
 - Note that Cypress also supports testing with Program Candidate measures published to the Electronic Clinical Quality Improvement (eCQI) Resource Center. Program Candidate eQMs are eQMs not yet adopted for use in a CMS quality reporting program. Program Candidate eQMs are not eligible for CMS quality reporting until proposed and finalized through notice-and-comment rulemaking for each applicable program. Figure 22 shows how CMS1157v1 is categorized as an Eligible Clinician Program Candidate eQM. If CMS1157 is finalized in a future Physician Fee Schedule rule, Cypress will re-categorize CMS1157 with the rest of the Eligible Clinician eQMs.

Figure 22. Selection of Program Candidate eQMs

- Once all the information has been entered on the Vendor Add Product page, select **Add Product**, as shown in Figure 23.

Figure 23. Vendor Add Product Page, Select “Add Product”

- The Vendor and Product will now display on the Dashboard.
- Select the product name under Products to begin defining tests for the product as shown in Figure 24.

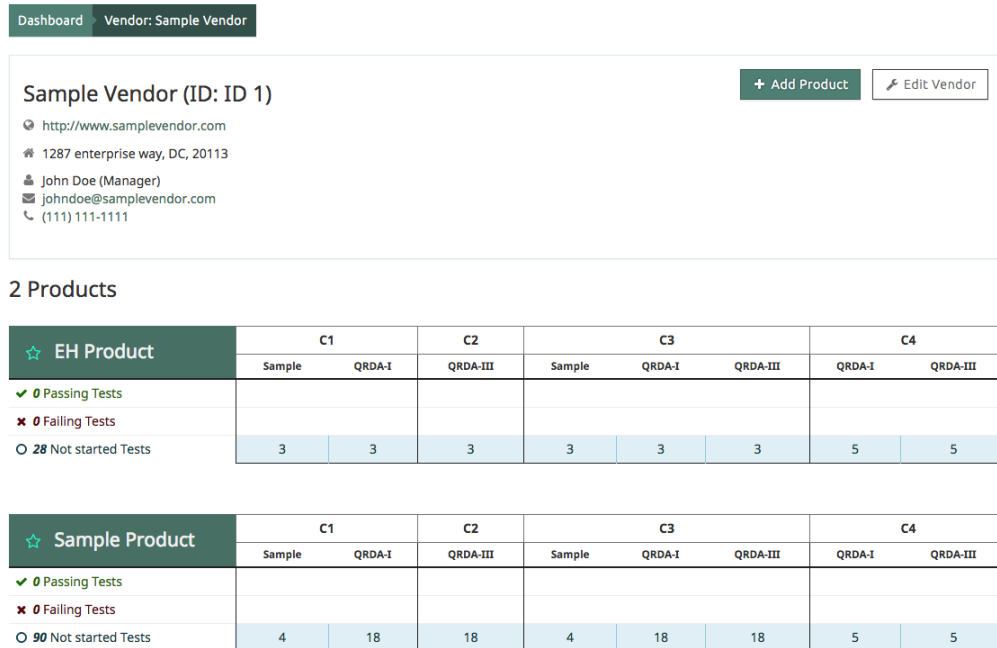


Figure 24. Dashboard Displaying a Vendor with Two Products Added

3.4 Test Execution

Background

This process evaluates the capability of the system under test (SUT) to electronically generate the proper eCQM artifacts for the eCQMs being certified.

The Test Proctor provides the Cypress v7 Test Data for the clinical quality measures for which the technology will be tested in the format selected by the Health IT vendor.

Depending on the test, the vendor manually inputs or electronically downloads the patient test data from Cypress that is used to test their technology.

- Selecting C1 certification along with C2, C3, and C4 will provide the vendor with the following certification test options that allow a Test Proctor to examine the eCQMs implemented in their technology:
 - C1-C3 Record Sample tests, which will have only four predetermined measures for testing of C1 and C3 certifications. This tab validates the technology for C1 and C3 certifications by entering specified patient data for four measures. Certifiers will download a QRDA zip file of patients, which is uploaded into their technology and re-uploaded into Cypress.
 - C1-C3 (QRDA-I), which will contain measures (based on your selection of all eCQMs or Custom for either hospitals or professionals). This tab will test the technology's ability to record and export (C1) and submit (C3) measure-based data.
 - C2-C3 (QRDA-III), which tests the technology's ability to import and calculate (C2) and submit (C3) measure-based data. Certifiers will submit XML patient files exported from their technology to verify calculation and submission of reporting.

- C4 (QRDA-I and QRDA-III), which test the technology’s ability to filter patient records.

This process enables you to test the product based on the Certification Types and Measures Options you selected when you created the product.

3.4.1 Automated Measure Test Execution

C1 as well as a C2, C3, or C4 certification type all require automated measure test execution. Figure 25 shows C1 and C2 certification types selected for all hospital eQMs with randomized and duplicate records to be included in the test data files created by Cypress. Products certifying to C2 criteria in addition to C1 will create a product that has a limited number of C1 record sample test measures, automated C1 measure test, and any other certification tests created.

Dashboard Vendor: Sample Vendor > Add Product

Add Product

Name

Sample Product

Version

Description

Product Types

☒ Certification Product

☐ CVU+ Product

Certification Types

☒ C1 Test

☒ C2 Test

☐ C3 Test

☐ C4 Test

Select the certification type Cypress should use to certify this product

Records Options

☒ Randomize Records

☒ Duplicate Records

Recommended for most robust testing.

Bundle Options

☐ Cypress bundle for the 2024 Reporting/Performance period (eCQM value sets as of May 4, 2023) 2023.0.0

☐ Cypress bundle for the 2023 Reporting/Performance period (eCQM value sets as of May 5, 2022) 2022.1.1

☒ Cypress bundle for the 2025 Reporting/Performance period (eCQM value sets as of May 2, 2024) 2024.0.0

Select the measure versions Cypress should use to certify this product.

☐ Shift Records

Selecting Shift Records will move patient data forward into the appropriate reporting period. Otherwise patient data will remain in a previously completed calendar year.

Measures Options

☒ Eligible Hospital eQMs (Including Pre-Rulemaking)

☐ Eligible Clinician eQMs (Including Pre-Rulemaking)

☐ All eQMs (Excluding Retried)

☐ Custom...

Indicate the clinical quality measures Cypress should use to certify this product. Testing will be performed on a measure-by-measure basis. Click 'Custom' to specify individual measures.

Add Product

Cancel

Figure 25. C1-C2 Automated Entry Certification

Figure 26 shows the result of adding the C1-C2 certification.

Dashboard

Vendor: Sample Vendor

✓

'Sample Product' was created.

✕

Sample Vendor (ID: ID 1)

+ Add Product

Edit Vendor

🌐 http://www.samplevendor.com

🏠 1287 enterprise way, DC, 20113

👤 John Doe (Manager)

✉ johndoe@samplevendor.com

📞 (111) 111-1111

2 Products

☆ Sample Product

✓ 0 Passing Tests

✗ 0 Failing Tests

○ 36 Not started Tests

C1		C2	C3			C4	
Sample	QRDA-I	QRDA-III	Sample	QRDA-I	QRDA-III	QRDA-I	QRDA-III
4	16	16					

Figure 26. Add Product for Automated Entry of Measure Data

To select a measure for testing, click on the product name shown in Figure 27.

Dashboard

Vendor: Sample Vendor

✓

'Sample Product' was created.

✕

Sample Vendor (ID: ID 2)

+ Add Product

⚙ Vendor Preferences

👤 Vendor Patients

Edit Vendor

🌐 http://www.samplevendor.com

🏠 1287 enterprise way, DC, 20013

👤 John Doe (Manger)

✉ johndoe@samplevendor.com

📞 (111) 111-1111

2 Products

☆ Sample Product

✓ 0 Passing Tests

✗ 0 Failing Tests

○ 36 Not started Tests

C1		C2	C3			C4	
Sample	QRDA-I	QRDA-III	Sample	QRDA-I	QRDA-III	QRDA-I	QRDA-III
4	16	16					

Figure 27. Selecting a Product to Test

Figure 28 shows the certification tests created for C1-C2 Hospital measures. Note the tab for record sample that contains only four measures as well as tabs for C1 all Hospital and C2 certifications. The first Record Sample Test validates the technology for C1 certification by entering specified patient data for those identified measures. The second tab, C1 (QRDA-I), tests the technology’s ability to record and export (C1), while the third tab, C2 (QRDA-III) tests the technology’s ability to import and calculate (C2). Two sections appear, side by side, toward the top of the page: Product Status and Download Full Test Deck. On the left side of the page is the Product Status section that provides, for each Certification

Type (based on the Measures Options you selected), a quick summary of the test cases that have passed, failed, and not yet started. On the right side of the page is a section entitled Download Full Test Deck. This download contains a folder for each measure selected for this product. These folders contain XML documents for each patient associated with that measure.

Dashboard

Vendor: Sample Vendor

Product: Sample Product

Sample Product

Edit Product

Download Report

✓ 0 Passing Tests

✗ 0 Failing Tests

○ 36 Not started Tests

C1		C2	C3		C4		
Sample	QRDA-I	QRDA-III	Sample	QRDA-I	QRDA-III	QRDA-I	QRDA-III
4	16	16					

Download Full Test Deck

This download contains a folder for each measure selected for this product. Inside these folders are XML documents for each patient associated with that measure.

Download All Patients (.zip)

C1 Sample

C1 (QRDA-I)

C2 (QRDA-III)

Validate the EHR system for C1 certification by entering specified patient data for the following measures.

View Record Sample

Upload Results	C1 Upload Results	Status
<div>○ Not Started</div>	<div>○ Not Started</div>	<div>○ Not Started</div>

Data Criteria Verification	Status
CMS31v6 Hearing Screening Prior To Hospital Discharge	Not Started
CMS104v6 Discharged on Antithrombotic Therapy	Not Started
CMS105v6 Discharged on Statin Medication	Not Started
CMS107v6 Stroke Education	Not Started

Figure 28. Showing C1 Record Sample, C1 Automated, and C2 Product Measures

To execute a Test for C1 (QRDA-1), select that tab and select the desired measure to begin testing, using either the Upload Link (if you already have your zip file ready for upload), or click on the Measure Name to download a test file to upload for C1 Certification testing as shown in Figure 29. The upload button will display a file selection dialogue box to select your file. The Measure Name Link will take you to the screen shown in Figure 30.

CMS ID	Measure Name	C1 Results	Quick Upload	Last Updated
CMS9v9	Exclusive Breast Milk Feeding	<input type="radio"/> Not Started	upload	⌚ 4 minutes ago
CMS68v10	Documentation of Current Medications in the Medical Record	<input type="radio"/> Not Started	upload	⌚ 4 minutes ago
CMS71v10	Anticoagulation Therapy for Atrial Fibrillation/Flutter	<input type="radio"/> Not Started	upload	⌚ 4 minutes ago
CMS72v9	Antithrombotic Therapy By End of Hospital Day 2	<input type="radio"/> Not Started	upload	⌚ 4 minutes ago
CMS104v9	Discharged on Antithrombotic Therapy	<input type="radio"/> Not Started	upload	⌚ 4 minutes ago
CMS105v9	Discharged on Statin Medication	<input type="radio"/> Not Started	upload	⌚ 4 minutes ago
CMS108v9	Venous Thromboembolism Prophylaxis	<input type="radio"/> Not Started	upload	⌚ 4 minutes ago
CMS111v9	Median Admit Decision Time to ED Departure Time for Admitted Patients	<input type="radio"/> Not Started	upload	⌚ 4 minutes ago

Figure 29. Product Measure Upload or Measure Name Selection

Once you have selected the Measure Name you want to test, Cypress displays the test page for that individual measure (e.g., CMS108v6) as shown in Figure 29.

Measure Test Information

Measure: Venous Thromboembolism Prophylaxis
HQMF ID: 40280382-5ABD-FA46-015B-1F6B95092A9D
CMS ID: CMS108v6

Provider Name: Graves, Danielle
Provider NPI: 1513804843
Provider TIN: 268221413
Provider CCN: 242520

[View Patients](#)
[Get Known Good Result](#)

C1

QRDA Errors --
Reporting Errors --
Execution Date --

C2

QRDA Errors --
Reporting Errors --
Execution Date --

[start](#)

1 ⚡ Download Test Deck

Download and import this data into your EHR clinical quality measure calculator.

[Download QRDA Category I \(.zip\)](#)

2 ⚡ Upload Files

Upload results from the EHR system in the form of a zip file of QRDA Category I documents to get test results. This will automatically run a test execution.

[Select file](#)

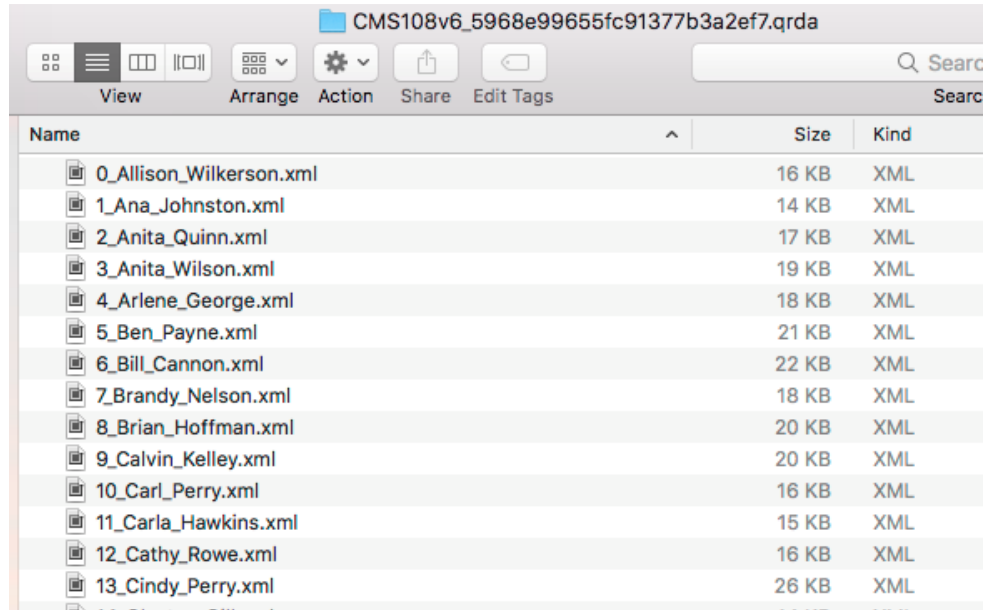
Figure 30. Individual Measure Test Page

- Patient test data for the selected eCQMs of the specified test must be downloaded in the format required for the test.
- Click the **Download QRDA Category I (.zip)** button to download the test data for that selected eCQM. The downloaded zip file will contain duplicate and randomized patient records that your technology should correct for the uploaded portion of the test. The downloaded patient record test data will be contained in a zip file. Figure 31 shows an example filename entry.

 CMS108v6_5968e99655fc91377b3a2ef7.qrda.zip 274 KB ZIP archive

Figure 31. Zip File of Patient Test Data for Selected eCQM

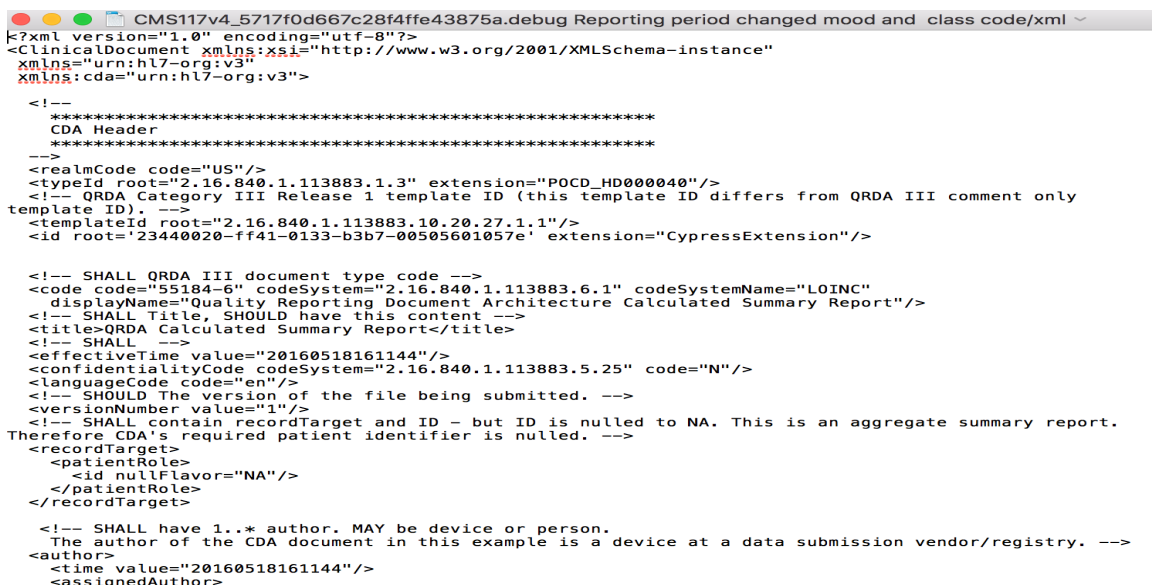
- If you click the **View Patients** link (shown in Figure 30), you will see a listing of the patients for that specific measure.
- Click **Get Known Good Results** link to download a zip file of patients that will pass the measure test you are planning to conduct as shown in Figure 32.



Name	Size	Kind
0_Allison_Wilkerson.xml	16 KB	XML
1_Ana_Johnston.xml	14 KB	XML
2_Anita_Quinn.xml	17 KB	XML
3_Anita_Wilson.xml	19 KB	XML
4_Arlene_George.xml	18 KB	XML
5_Ben_Payne.xml	21 KB	XML
6_Bill_Cannon.xml	22 KB	XML
7_Brandy_Nelson.xml	18 KB	XML
8_Brian_Hoffman.xml	20 KB	XML
9_Calvin_Kelley.xml	20 KB	XML
10_Carl_Perry.xml	16 KB	XML
11_Carla_Hawkins.xml	15 KB	XML
12_Cathy_Rowe.xml	16 KB	XML
13_Cindy_Perry.xml	26 KB	XML

Figure 32. Listing of Zip File of XML Patient Test Data for Testing Selected eQCM

- Select a single patient record and open the XML from the zip file listing to view the information. Figure 33 presents an example screenshot.



```

<?xml version="1.0" encoding="utf-8"?>
<ClinicalDocument xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns="urn:hl7-org:v3"
  xmlns:cda="urn:hl7-org:v3">
  <!--
  *****
  CDA Header
  *****
  -->
  <realmCode code="US"/>
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <!-- QRDA Category III Release 1 template ID (this template ID differs from QRDA III comment only
  template ID). -->
  <templateId root="2.16.840.1.113883.10.20.27.1.1"/>
  <id root="23440020-ff41-0133-b3b7-00505601057e" extension="CypressExtension"/>

  <!-- SHALL QRDA III document type code -->
  <code code="55184-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
    displayName="Quality Reporting Document Architecture Calculated Summary Report"/>
  <!-- SHALL Title, SHOULD have this content -->
  <title>QRDA Calculated Summary Report</title>
  <!-- SHALL -->
  <effectiveTime value="20160518161144"/>
  <confidentialityCode codeSystem="2.16.840.1.113883.5.25" code="N"/>
  <languageCode code="en"/>
  <!-- SHOULD The version of the file being submitted. -->
  <versionNumber value="1"/>
  <!-- SHALL contain recordTarget and ID - but ID is nulled to NA. This is an aggregate summary report.
  Therefore CDA's required patient identifier is nulled. -->
  <recordTarget>
    <patientRole>
      <id nullFlavor="NA"/>
    </patientRole>
  </recordTarget>

  <!-- SHALL have 1..* author. MAY be device or person.
  The author of the CDA document in this example is a device at a data submission vendor/registry. -->
  <author>
    <time value="20160518161144"/>
    <assignedAuthor>

```

Figure 33. Patient XML File for C2 Test

- Once the technology has generated the test results in the QRDA Category I format, the results are uploaded from that individual measure's test page under the Upload files section. For C2 and C3 testing, this upload would occur in QRDA Category III format.
- Click on **Select file** as shown in Figure 34, browse to the QRDA Category I file you want to upload, and click **Choose**.

CMS108v9 Measure Test

Measure: Venous Thromboembolism Prophylaxis
HQMF ID: 2C928085-7198-38EE-0171-98D769C40223
CMS ID: CMS108v9 (eCQM Specification)

Provider Name: Jane Sparks
Provider NPI: 1866014743
Provider TIN: 711247952
Provider CCN: 496504

[View Patients](#)
[Get Known Good Result](#)

C1	Errors --	Errors --
Warnings --	Warnings --	Warnings --
Execution Date --	Execution Date --	Execution Date --

start

1 ⚡ Download Test Deck

Download and import this data into your EHR clinical quality measure calculator.

[Download QRDA Category I \(.zip\)](#)

2 ⚡ Upload Files

Upload results from the EHR system in the form of a zip file of QRDA Category I documents to get test results. This will automatically run a test execution.

Select file

Figure 34. Upload Test Execution Results

- The Test Proctor will then validate that the proper eCQM artifacts in QRDA Category I file format for the test being performed are electronically generated by the Health IT Module SUT.
- Validation results will then be displayed in the Dashboard for that specific vendor's product as shown in Figure 35.

2 Products

☆ EH Product	C1		C2	C3			C4	
	Sample	QRDA-I	QRDA-III	Sample	QRDA-I	QRDA-III	QRDA-I	QRDA-III
✓ 2 Passing Tests		1			1			
✗ 0 Failing Tests								
○ 26 Not started Tests	3	2	3	3	2	3	5	5

☆ Sample Product	C1		C2	C3			C4	
	Sample	QRDA-I	QRDA-III	Sample	QRDA-I	QRDA-III	QRDA-I	QRDA-III
✓ 0 Passing Tests								
✗ 1 Failing Tests		1						
○ 35 Not started Tests	4	15	16					

Figure 35. Example of Test Execution Summary Results

3.4.2 Record Sample Test

To begin record sample testing (and validate the technology for C1 certification by entering specified patient data for specific measures), select the Record Sample Test tab and then select **View Test** as shown in Figure 36.

C1 + C3 Sample

C1 + C3 (QRDA-I)

C2 + C3 (QRDA-III)

C4 (QRDA-I and QRDA-III)

Validate the EHR system for C1 and C3 certifications by entering specified patient data for the following measures.

View Record Sample

Upload Results	C1 Upload Results	C3 Upload Results	Status
<input type="radio"/> Not Started	<input type="radio"/> Not Started	<input type="radio"/> Not Started	<input type="radio"/> Not Started

Data Criteria Verification	Status
CMS32v7 Median Time from ED Arrival to ED Departure for Discharged ED Patients	Not Started
CMS55v6 Median Time from ED Arrival to ED Departure for Admitted ED Patients	Not Started
CMS111v6 Median Admit Decision Time to ED Departure Time for Admitted Patients	Not Started

Figure 36. Record Sample Test, Select “View Test”

As shown in Figure 37, this action will bring you to the Record Sample Checklist test page, which displays the status of each test on the right margin (i.e., Not Started, Passing, or Failing). The Record Sample Checklist page also displays a summary of each test and allows the user to check off (and save) a test when it has been completed.

3 ⚡ View Results

Upload Results	C1 Upload Results	Status
<input type="radio"/> Not Started	<input type="radio"/> Not Started	<input type="radio"/> Not Started
Data Criteria Verification	Status	
CMS111v10 Median Admit Decision Time to ED Departure Time for Admitted Patients	Not Started	

Edit Test

CMS111v10 Median time (in minutes) from admit decision time to time of departure from the emergency department for emergency department patients admitted to inpatient status

Validated in QRDA	Data Criteria	Section	Required Attributes	Value Set(s)	Recorded Code/Attribute Value
		Valuesets		Encounter Inpatient 2.16.840.1.113883.3.666.5.307	Code <input type="text"/>
	QDM::EncounterPerformed				
		Attributes	diagnoses	diagnoses 2.16.840.1.113883.3.117.1.7.1.299	Attribute code <input type="text"/>
		Valuesets		Decision to Admit to Hospital Inpatient 2.16.840.1.113883.3.117.1.7.1.295	Code <input type="text"/>
	QDM::EncounterOrder				
		Attributes	authorDatetime		Recorded result <input type="text"/>

Save

Figure 37. Record Sample Page

When choosing a code to demonstrate entry of a Record Sample data criteria, click on the allowable value sets to view a listing of valid codes as shown in Figure 38. Clicking on the allowable value sets will open a window displaying all the codes in the value sets as shown in Figure 39. The list is searchable, allowing a user to find an appropriate code for entry.

Validated in QRDA	Data Criteria	Section	Required Attributes	Value Set(s)	Recorded Code/Attribute Value
		Valuesets		Encounter Inpatient 2.16.840.1.113883.3.666.5.307	Code <input type="text"/>
	QDM::EncounterPerformed				
		Attributes	diagnoses	diagnoses 2.16.840.1.113883.3.117.1.7.1.299	Attribute code <input type="text"/>
		Valuesets		Decision to Admit to Hospital Inpatient 2.16.840.1.113883.3.117.1.7.1.295	Code <input type="text"/>
	QDM::EncounterOrder				
		Attributes	authorDatetime		Recorded result <input type="text"/>

Figure 38. View Listing of Valid Codes

☐ Not Started
☐ Not Started
☐ Not Started

Data Criteria Verification

Status
Not Started

CMS111v10 Median Admit Decision Time to ED Departure Time for Admitted Patients

Validated in QRDA

Data Criteria

CMS111v10 Median time (in minutes) from admit decision time to time of departure from the emergency department for emergency department patients admitted to inpatient status

Valuesets

2.16.840.1.113883.3.666.5.307

QDM::EncounterPerformed

Attributes

diagnoses

diagnoses
2.16.840.1.113883.3.117.1.7.1.299

Attribute code

Valuesets

Decision to Admit to Hospital Inpatient
2.16.840.1.113883.3.117.1.7.1.295

Code

QDM::EncounterOrder

Attributes

authorDatetime

Recorded result

List of codes

Emergency hospital admission (procedure): 183452005
Hospital admission (procedure): 32485007
Hospital admission, elective (procedure): 8715000

Figure 39. Search for Valid Codes

Completing and saving a test, as shown in Figure 40, will then refresh the page and provide an updated status description for that specific test.

Validated in QRDA	Data Criteria	Section	Required Attributes	Value Set(s)	Recorded Code/Attribute Value
		Valuesets		Encounter Inpatient 2.16.840.1.113883.3.666.5.307	Code <input type="text"/>
	QDM::EncounterPerformed	Attributes	diagnoses	diagnoses 2.16.840.1.113883.3.117.1.7.1.299	Attribute code <input type="text"/>
		Valuesets		Decision to Admit to Hospital Inpatient 2.16.840.1.113883.3.117.1.7.1.295	Code <input type="text"/>
	QDM::EncounterOrder	Attributes	authorDatetime		Recorded result <input type="text"/>
<div> <input type="button" value="Save"/> </div>					

Figure 40. Complete and Save a Test

When all your manual test measure entries are correct and have a completed checkmark, the Select button will be enabled to allow upload of your XML files (zipped into a single file) into Cypress for certification as shown in Figure 41.

1 ⚡ Record Sample Instructions

- Fill in the Data Criteria fields below.
 - If a Data Criteria has value sets listed, an appropriate code needs to be entered into the "Recorded Code" text box.
 - If an Attribute has a value set, an appropriate code needs to be entered into the "Recorded Attribute Code" text box.
 - Codes are validated upon saving.
 - Result, Date Times, and Related To are to be recorded as free text. ATLS will record the values they have observed being entered into the system under test.
- Create (at least) one patient for each measure below. Patients may be created using a user interface, or may be created as a structured document to be imported into the system under test.
 - There are no requirements on what format the structured data artifact must be. Could be CCDA, QRDA, or other formats.
 - This structured data artifact needs to be created at the time of certification
 - The created patients must contain all required Data Criteria, for the selected measures, to pass certification.
 - Export the created patients as QRDA Category I, and create a zip file.
- Upload zip file with created test patients.

2 ⚡ Upload Files

Fill in the Data Criteria fields before you upload results from your EHR system.

Figure 41. Select File to Upload

3.4.3 CQM Filtering Test

The filter functionality included in this criterion allows a provider to query for eCQM results using one or a combination of data captured by the Certified Health IT Module for quality improvement and quality reporting purposes. It can also help identify health disparities, enable care quality improvement, and support providers in delivering more effective care to their patient populations. This certification criterion requires that a Health IT Module be capable of recording data (according to specified standards, where

applicable) and filtering eCQM results at both patient and aggregate levels. These filters include, but are not limited to, practice site address, patient age, patient sex, and patient problem list.

- To begin eCQM filtering testing, click the C4 (QRDA-I and QRDA-III) Filtering Test tab, and click **start** on the Category I or Category III filtering criteria you are interested in testing, as shown in Figure 42.

Filtering Criteria	QRDA Category I	QRDA Category III	Last Updated
Age/Ethnicities	start upload	start upload	an hour ago
NPI & TIN	start upload	start upload	an hour ago
NPI, TIN & Provider Location	start upload	start upload	an hour ago
Payers/Ethnicities	start upload	start upload	an hour ago
Races/Genders	start upload	start upload	an hour ago

Figure 42. Select a Category I or Category III to Test

- In this example, the Category I test page for Median Time from ED Arrival to ED Departure for Discharged ED Patients will be displayed as shown in Figure 43.

C1 | C2 | C3 | **C4**

Previous Test: CMS32v7

Next Test: CMS32v7

Filtering Test Information
Measure: Median Time from ED Arrival to ED Departure for Discharged ED Patients
HQMF ID: 40280382-5A66-EAB9-015A-AF5BA5D72C52
CMS ID: CMS32v7
[View Patients](#)
[Get Known Good Result](#)

QRDA Category I

QRDA Errors --
Reporting Errors --
Submission Errors --
Warnings --
Execution Date --

QRDA Category III

QRDA Errors --
Reporting Errors --
Submission Errors --
Warnings --
Execution Date --

1 **Download Test Deck**

2 **Filter Patients**

3 **Upload Files**

Download and import this data into your EHR clinical quality measure calculator.
Download QRDA Category I (.zip)

Remove any patients not meeting the following criteria.
Age As Of July 14, 2017
Minimum 62
Ethnicities
Not Hispanic or Latino (code: 2186-5)

Upload results from the EHR system in the form of a zip file of QRDA Category I documents to get test results. This will automatically run a test execution.
 Select file

Figure 43. Category I Test Page for Median Time from ED Arrival to ED Departure for Discharged ED Patients

- Patient test data for the specified test must be downloaded in the format required for the test. This step, and those following, adhere to the same process as the steps outlined in the *Measure Tests* section, and will not be repeated here.

3.5 Test Execution Success Criteria

The criteria to determine a successful test outcome depend on whether the Health IT Module is being certified against the EC eCQMs or the EH eCQMs. The criteria for test execution success are as follows:

- **For EC eCQMs**, a successful test outcome is one in which the following conditions are true:
 1. There were no XML validation errors in either the QRDA Category I submitted data or the QRDA Category III submitted data.
 2. All eCQM results calculated and submitted by the Health IT Module SUT exactly match the values that Cypress v7 was expecting.
- **For EH eCQMs**, a successful test outcome is one in which the following conditions are true:
 1. There were no XML validation errors in either the QRDA Category I submitted data or the QRDA Category III submitted data.
 2. All eCQM results calculated and submitted by Health IT Module SUT for discrete measures exactly match the values that Cypress v7 was expecting.
 3. The eCQM results calculated and submitted by the Health IT Module SUT for continuous variable tests are within a defined delta of the value that Cypress v7 was expecting.

For both types of technologies, it is acceptable to have XML validation *warnings* generated by the Cypress validation process. These warnings do not constitute a test failure; however, the Test Proctor should review the warnings generated and record any relevant observations about the reasons for the warnings.

Cypress groups failed test cases into three categories: (1) QRDA errors associated with logic and improper use of the QRDA standard, (2) reporting errors associated with errors in the calculation and aggregation of measure data for reporting purposes, and (3) submission errors associated with improper logic and formatting for submitting measure data to CMS. In addition to errors, Cypress will flag and report on warnings that indicate non-conformance with the CMS Implementation Guide (and associated schematron validation). Note, for Health IT Modules not certifying for reporting (C3), non-conformance with the HL7 QRDA Implementation Guide will be treated as warnings. Figure 44 provides an example of measure test failure results.

C1C2

Previous Test: CMS107v6

Next Test: CMS111v6

Measure Test Information

Measure: Venous Thromboembolism Prophylaxis

HQMF ID: 40280382-5ABD-FA46-015B-1F6B95092A9D

CMS ID: CMS108v6

Provider Name: Graves, Danielle

Provider NPI: 1513804843

Provider TIN: 268221413

Provider CCN: 242520

View Patients

Get Known Good Result

C1

QRDA Errors0

Reporting Errors10

Execution DateJuly 14, 2017 4:28pm

C2

QRDA Errors--

Reporting Errors--

Execution Date--

✖ Failing

start

1Download Test Deck

Download and import this data into your EHR clinical quality measure calculator.

Download QRDA Category I (.zip)

2Upload Files

Upload results from the EHR system in the form of a zip file of QRDA Category I documents to get test results. This will automatically run a test execution.

Select file

Results

Most Recent - July 14, 2017 4:28pm (10 errors)Refresh View

✖ Failed with 10 errors

Missing or Duplicate Files

✖ 61 files expected but was 67

Errors and Warnings

✖ 17_Dale_Parker.xml1

✖ 27_Ella_Guzman.xml1

✖ 55_Sally_Reeves.xml7

17_Dale_Parker.xml - 1 errors and warnings

View Uploaded XML with Errors

QRDA (0)Reporting (1)Submission (0)CMS Warnings (0)Other Warnings (0)

Error message

Go To in XML

Patient 'DALE PARKER' not expected to be returned.

Figure 44. Measure Test Failure Messages

3.6 Submit

Electronically Submit Generated eCQM Artifacts

This functionality allows evaluation of the capability to electronically submit (a) calculated quality measures in accordance with the standard and implementation specifications, and (b) exported patient data sufficient to allow external calculation as follows:

- The Test Proctor commands the Health IT Module SUT to generate and electronically submit the patient-level export in the QRDA Category I format for the clinical quality measures being tested.
- The Test Proctor commands the Health IT Module SUT to generate and electronically submit an aggregate report in the QRDA Category III format of the clinical quality measures calculated in the test.

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-
- The Test Proctor validates that the calculated clinical quality measures are submitted in accordance with the QRDA Category III standard and implementation specifications by uploading the QRDA Category III XML via the Cypress v7 User Interface and the Cypress-supplied XML Schema validation.
 - The Test Proctor validates that the exported patient-level eCQM data are submitted in accordance with the QRDA Category I standard and implementation specifications by uploading the QRDA Category I XML via the Cypress v7 User Interface and the Cypress-supplied XML Schema validation.

3.7 Verify

Verify Electronic and Accurate Generation of Clinical Quality Measure Artifacts

This functionality allows evaluation of the capability to electronically and accurately generate eCQM artifacts appropriate for each phase of the test procedure as follows:

- After the Test Proctor validates the submission of the QRDA Category III, the Test Proctor evaluates and displays the accuracy of the submitted clinical quality measure results via the Cypress v7 User Interface.
- The Test Proctor generates a test artifact bundle containing all test data used for this test execution, all products generated and submitted by the Health IT Module SUT, and any other additional notes or information that the Test Proctor deems relevant into a single archive file that is cryptographically signed.

3.8 Cypress Validation Utility + Calculation Check (CVU+)

This functionality integrates the existing Cypress Validation Utility into Cypress with the following enhancements to align with the CMS submission systems:

- **Developer-generated Test Patients** – A vendor can supplement Cypress test patients with their own test patients to increase eCQM logic/code coverage.
- **Code System Preference** – A vendor can choose preferences for the code systems to be used in test patients.
- **Multi-Measure Tests** – A vendor can test calculations with a single test deck across multiple measures.
- **Enhanced CMS Implementation Guide Validations** – CVU+ verifies Implementation Guide constraints that are not validated by schematron.

3.8.1 Developer-Generated Test Patients

After following the instructions in subsection 3.3, Cypress v7 Preparation for Testing, to add a vendor, a user can manage a set of Vendor Patients for use with CVU+ tests created for that vendor. To manage this set of Vendor Patients, first select Vendor Patients from the Vendor Page as shown in Figure 45.

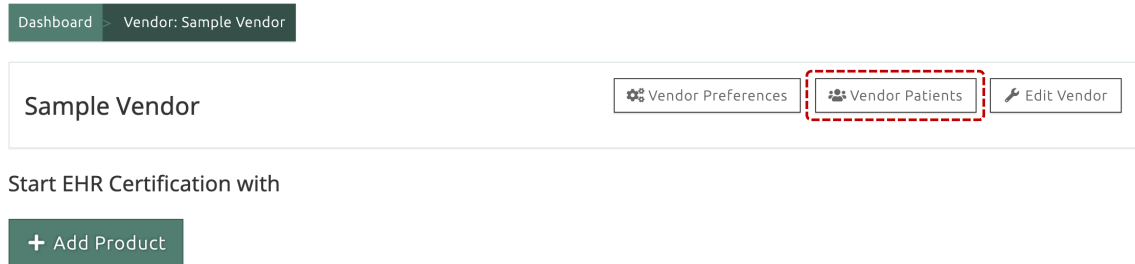


Figure 45. Vendor Page, Select Vendor Patients

From the Vendor Patient page, you can add Vendor Patients by selecting **Import Patients** as shown in Figure 46.

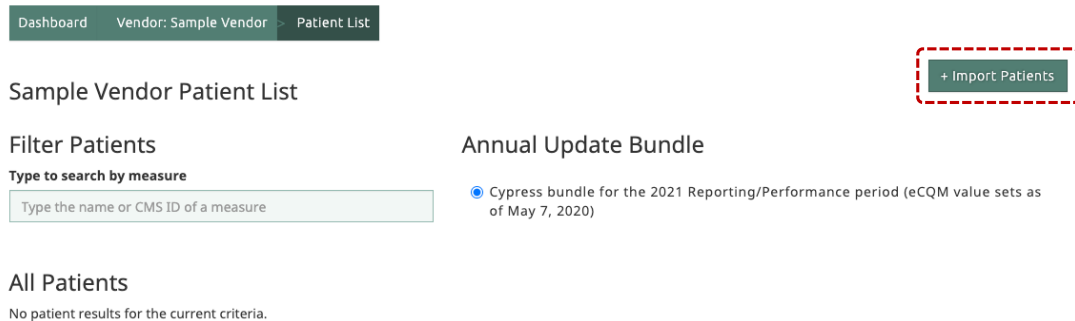


Figure 46. Import Patients

From the **Import Patients** page, you can **select** the bundle for uploading the Vendor Patients (e.g., Cypress Bundle for 2020 Reporting/Performance period). Select **Choose File** on the **Import Patients** page to select a .zip file of QRDA documents to upload. After a .zip file of QRDA documents is chosen, select **Import Patients** to start the import process as shown in Figure 47.

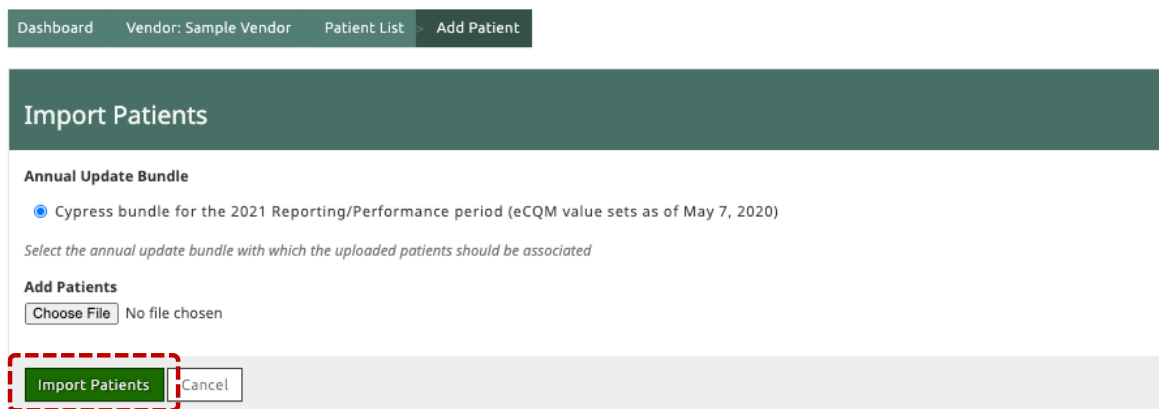


Figure 47. Import Vendor Patients

After the import process has completed, you will be redirected to the Vendor Patients page, which will show a listing of the imported patients depicted in Figure 48. The Vendor Patients page has the identical functionality of the Master Patient List. This functionality is described in subsection 3.2.1, Master Patient List.

Dashboard

Vendor: Sample Vendor

Patient List

Sample Vendor Patient List

+ Import Patients

Filter Patients

Type to search by measure

Type the name or CMS ID of a measure

Annual Update Bundle

☒ Cypress bundle for the 2021 Reporting/Performance period (eCQM value sets as of May 7, 2020)

All Patients

View Patient Analytics

Select	Patient Name	DOB	Gender
<input type="checkbox"/>	Vendor Patient 1	September 17, 1976	Female
<input type="checkbox"/>	Vendor Patient 2	January 10, 1960	Male

Figure 48. Listing of Imported Vendor Patients

From the Vendor Patients page, you can also delete patients you would no longer like to use in test generation. To remove a patient, select the checkbox opposite the patient's name and then select Delete Selected Patients when it appears at the bottom of the page, as shown in Figure 49. Note that a confirmation action is required to complete any deletion actions.

Dashboard

Vendor: Sample Vendor

Patient List

Sample Vendor Patient List

+ Import Patients

Filter Patients

Type to search by measure

Type the name or CMS ID of a measure

Annual Update Bundle

☒ Cypress bundle for the 2021 Reporting/Performance period (eCQM value sets as of May 7, 2020)

All Patients

View Patient Analytics

Select	Patient Name	DOB	Gender
<input checked="" type="checkbox"/>	Vendor Patient 1	September 17, 1976	Female
<input type="checkbox"/>	Vendor Patient 2	January 10, 1960	Male

Delete Selected Patients

Deletion is permanent and cannot be undone. Be sure you want to do this.

Delete Selected Patients

Figure 49. Delete Selected Patients

3.8.2 Code System Preference

After following the instruction to add a vendor in subsection 3.3, Cypress v7 Preparation for Testing, a user can manage code system preferences for use with CVU+ tests created for that vendor. These code system preferences apply when selecting the codes to be included in generated test patients. Select **Vendor Preference** from the **Vendor Page** to manage code system preferences as shown in Figure 50.



Figure 50. Vendor Preferences

On the **Vendor Preferences** page, you can reorder the list of code systems available for each Quality Data Model data type. For example, the Adverse Event data types uses codes from the RXNORM and SNOMEDCT code systems. You can indicate RXNORM as your preferred code system by clicking and dragging the handle on the left side of the code system name and moving it to the top of the list as shown in Figure 51. By prioritizing RXNORM over SNOMEDCT, only the RXNORM code will be exported in the QRDA document when a test patient has both RXNORM and SNOMEDCT codes available. After re-ordering a code system, select **Save** at the bottom of the page.

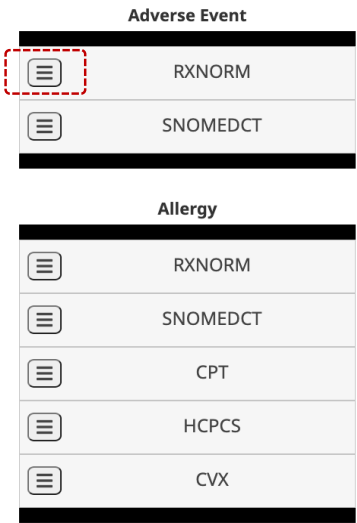


Figure 51. Ordering Code Systems

3.8.3 Creating CVU+ Tests

After following the instruction to add a vendor in subsection 3.3, Cypress v7 Preparation for Testing, and following the instructions in 3.8.1, Developer Generated Patients and 3.8.2, Code System Preference, a user can create a CVU+ test to test calculations with a single test deck across multiple measures and test the ability to report QRDA documents to CMS submission systems. To create this test, select **Add Product** from the Vendor Page as shown in Figure 52.

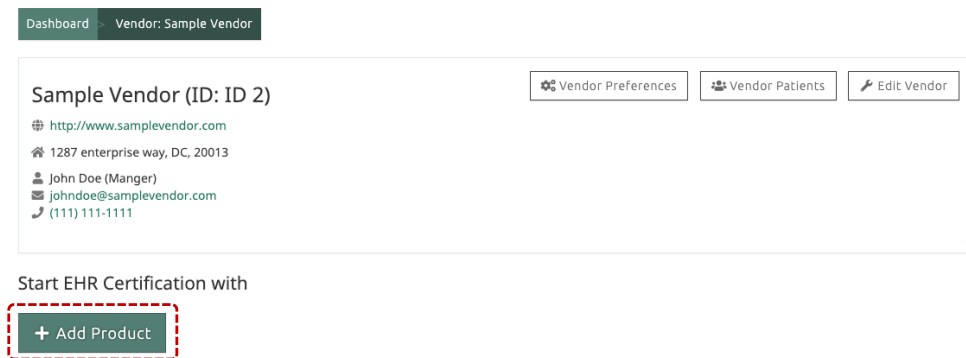


Figure 52. Add CVU+ Product

The main difference between creating a test for certification and creating a test for CVU+ is that you will need to select the CVU+ Product radio button highlighted in Figure 53. This gives you the option of selecting Include bundle patients (which will include test patients from the Cypress Bundle in the generated test decks) and the option of selecting Include vendor patient (which will include test patients uploaded following the steps in subsection 3.8.1, Developer Generated Patients). CVU+ test do not require the selection of C1, C2, C3, or C4 certification criteria (because CVU+ is not a certification test).

Dashboard
Vendor: Sample Vendor
Add Product

Add Product

Name
CVU+ Product

Version

Description

Product Types

☐ Certification Product

☒ CVU+ Product

Records Options

☒ Randomize Records

☒ Duplicate Records

Recommended for most robust testing.

Bundle Options

☒ Cypress bundle for the 2021 Reporting/Performance period (eCQM value sets as of May 7, 2020) 2020.0.0

Select the measure versions Cypress should use to certify this product.

☒ Include bundle patients

☒ Include vendor patients

Choose patient sets to include in product

☐ Shift Records

Selecting Shift Records will move patient data forward into the appropriate reporting period. Otherwise patient data will remain in a previously completed calendar year.

Measures Options

☐ Eligible Hospital eCQMs

☐ Eligible Professional eCQMs

☐ All eCQMs

☒ Custom...

Indicate the clinical quality measures Cypress should use to certify this product. Testing will be performed on a measure-by-measure basis. Click 'Custom' to specify individual measures.

Select Custom Measures 19
Clear all

Type to filter by measure

Type a keyword or CMS ID of a measure

Admissions and Readmissions to Hospitals (1 EH)

Care is Personalized and Aligned with Patient's Goals (1 EH)

Communication and Care Coordination (2 EP)

Community/Population Health (11 EP) 11

Effective Clinical Care (21 EP)

Efficiency and Cost Reduction (4 EP)

Patient Safety (4 EP)

Person and Caregiver-Centered Experience and Outcomes (5 EP)

Preventive Care (8 EH) 8

☒ Select all 8 Preventive Care measures

☒ CMS71v10 Anticoagulation Therapy for Atrial Fibrillation/Flutter (EH)

☒ CMS72v9 Antithrombotic Therapy By End of Hospital Day 2 (EH)

☒ CMS104v9 Discharged on Antithrombotic Therapy (EH)

☒ CMS105v9 Discharged on Statin Medication (EH)

☒ CMS108v9 Venous Thromboembolism Prophylaxis (EH)

☒ CMS190v9 Intensive Care Unit Venous Thromboembolism Prophylaxis (EH)

☒ CMS506v3 Safe Use of Opioids - Concurrent Prescribing (EH)

☒ CMS529v1 Core Clinical Data Elements for the Hybrid Hospital-Wide Readmission (HWR) Measure with Claims and Electronic Health Record Data (EH)

Add Product
Cancel

Figure 53. Creating a CVU+ Product

Once the CVU+ product is created, a user will be redirected to a CVU+ product page (Figure 54). This product page will list the Multi-Measure Tests for testing calculations with a single test deck across multiple measures, and CMS Program Tests for testing reporting requirement for CMS submission systems.

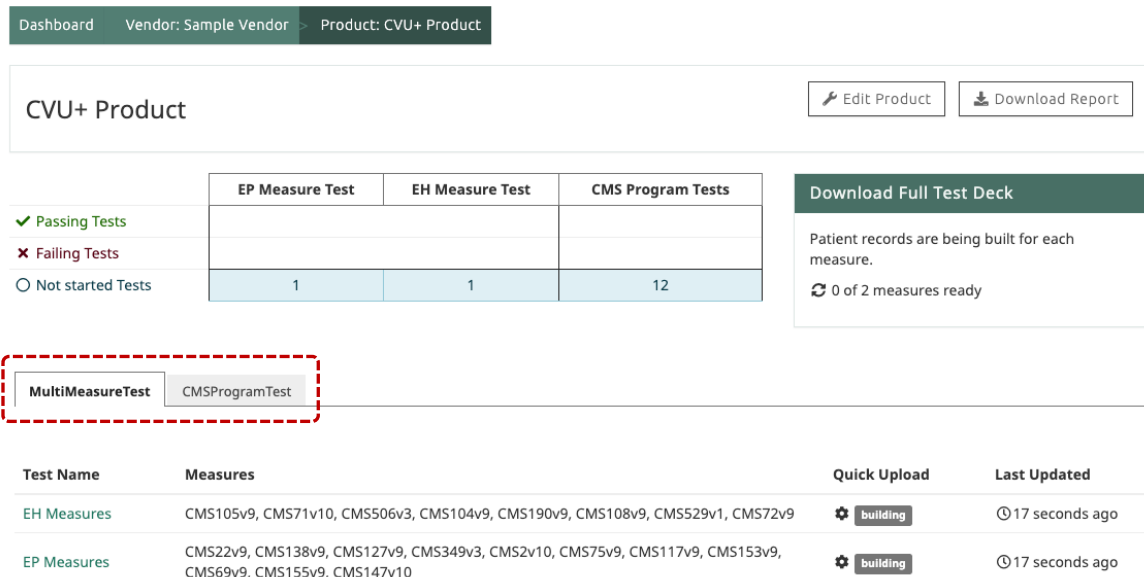


Figure 54. CVU+ Product Page

3.8.3.1 Multi-Measure Tests

When a **CVU+ Product** is created, Cypress will generate (at most) two Multi-Measure Tests. Cypress will generate one Multi-Measure Test for all Hospital eCQMs and Cypress will generate one Multi-Measure Test for all Eligible Professional / Eligible Clinician eCQMs. Both **EC Measures** and **EH Measures** tests require you to download a test deck of QRDA Category I patients and import the test deck into your system. The **EC Measures** test will only require you to upload a single QRDA Category III file that reports the calculations for all the EC measures. The **EH Measures** test will only require you to upload a single zip file of QRDA Category I files for the patients reported. Error messages that result from the upload will be displayed in the same manner as the single measure tests in Figure 44.

3.8.3.2 CMS Program Tests

When a **CVU+ Product** is created, Cypress will generate a test for each appropriate CMS program shown in Figure 55. If EH measures are selected, Cypress will generate a test for the following programs:

- Hospital Quality Reporting for the Promoting Interoperability Program (HQR_PI)
- Hospital Quality Reporting for the Inpatient Quality Reporting Program (HQR_IQR)
- Hospital Quality Reporting for the Promoting Interoperability Program and the Inpatient Quality Reporting Program (HQR_PI_IQR)
- Hospital Outpatient Quality Reporting Program (HQR_OQR)

If EC measures are selected, Cypress will generate a test for the following programs:

- MIPS Individual (MIPS_INDIV)
- MIPS Group (MIPS_GROUP)
- MIPS Virtual Group (MIPS_VIRTUALGROUP)

- MIPS Alternative Payment Model Entity (MIPS_APMENTITY)
- MIPS Alternative Payment Model Performance Pathway Individual (MIPS_APP1_INDIV)
- MIPS Alternative Payment Model Performance Pathway Group (MIPS_APP1_GROUP)
- MIPS Alternative Payment Model Performance Pathway Entity (MIPS_APP1_APMENTITY)
- MIPS Subgroup Reporting (MIPS_SUBGROUP)
- Primary Care First (PCF)

Dashboard
Vendor: Sample Vendor
Product: test

test
Edit Product
Download Report

	EC Measure Test	EH Measure Test	CMS Program Tests
✓ Passing Tests			
✗ Failing Tests			
○ Not started Tests	1	1	15

Download Full Test Deck

This download contains a folder for each measure selected for this product. Inside these folders are XML documents for each patient associated with that measure.

Download All Patients (.zip)

MultiMeasureTest
CMSProgramTest

Test Name	Quick Upload	Last Updated
HQR_PI Test	▶ start upload	🕒 4 minutes ago
HQR_IQR Test	▶ start upload	🕒 4 minutes ago
HQR_PL_IQR Test	▶ start upload	🕒 4 minutes ago
HQR_OQR Test	▶ start upload	🕒 4 minutes ago
MIPS_GROUP Test	▶ start upload	🕒 4 minutes ago
MIPS_INDIV Test	▶ start upload	🕒 4 minutes ago
MIPS_VIRTUALGROUP Test	▶ start upload	🕒 4 minutes ago
MIPS_APMENTITY Test	▶ start upload	🕒 4 minutes ago
MIPS_APP1_INDIV Test	▶ start upload	🕒 4 minutes ago
MIPS_APP1_GROUP Test	▶ start upload	🕒 4 minutes ago
MIPS_APP1_APMENTITY Test	▶ start upload	🕒 4 minutes ago
MIPS_SUBGROUP Test	▶ start upload	🕒 4 minutes ago
PCF Test	▶ start upload	🕒 4 minutes ago
HL7 Cat I (STU 5.3) Test	▶ start upload	🕒 4 minutes ago
HL7 Cat III (R1) Test	▶ start upload	🕒 4 minutes ago

Figure 55. CMS Program Tests

CMS Program Tests follow a similar workflow as the C1 Record Sample Tests described in subsection 3.4.2. Clicking in the CMS Program Test name (shown in Figure 56) will take you to a test page for the specific program shown in Figure 57.














































MultiMeasureTest		CMSProgramTest	
Test Name	Quick Upload	Last Updated	
HQR_PI Test	  	🕒 5 minutes ago	
HQR_IQR Test	  	🕒 5 minutes ago	
HQR_PL_IQR Test	  	🕒 5 minutes ago	
HQR_OQR Test	  	🕒 5 minutes ago	
MIPS_GROUP Test	  	🕒 5 minutes ago	
MIPS_INDIV Test	  	🕒 5 minutes ago	
MIPS_VIRTUALGROUP Test	  	🕒 5 minutes ago	
MIPS_APMENTITY Test	  	🕒 5 minutes ago	
MIPS_APP1_INDIV Test	  	🕒 5 minutes ago	
MIPS_APP1_GROUP Test	  	🕒 5 minutes ago	
MIPS_APP1_APMENTITY Test	  	🕒 5 minutes ago	
MIPS_SUBGROUP Test	  	🕒 5 minutes ago	
PCF Test	  	🕒 5 minutes ago	
HL7 Cat I (STU 5.3) Test	  	🕒 5 minutes ago	
HL7 Cat III (R1) Test	  	🕒 5 minutes ago	

Figure 56. Select CMS Program Test

CMS Implementation Guide Checklist (HQR_PI)

1 ⚡ CMS Implementation Guide Checklist Instructions

- Enter the information below into your EHR and record the entered values in the inputs boxes provided.
 - The "CMS IG Conformance Statement Reference" can be used to find specific guidance in the CMS Implementation Guide.
 - This information may need to be entered into a patient record, a provider profile or as a system configuration.
- Export (at least) one QRDA file that contains the information below and upload to Cypress.
 - Cypress will attempt to find the information below in the uploaded QRDA files.
 - When the information is found, a green checkmark will appear in the "Validated in QRDA" column. The file name where the information is found will also be indicated.
- Click the View Results link for:
 - Additional Program specific validations.
 - eCQM Calculation Results (for QRDA Category I uploads).

2 ⚡ Upload Files

Upload results from the EHR system in the form of a zip file of QRDA Category I documents to get test results. This will automatically run a test execution.

Upload Results	Status
<input type="radio"/> Not Started	<input type="radio"/> Not Started

Validated in QRDA	Data Criteria	Description	CMS IG Conformance Statement Reference	Recorded Value in Health IT
	CMS Certification Number	The organizations Facility CMS Certification Number (CCN). CCN is required for HQR.	(CONF:4388-28241_C01)	<input type="text"/>
	Medicare HIC Number	Medicare HIC Number is not required for HQR but should be submitted if the payer is Medicare and the patient has an HIC number assigned.	(CONF:4388-16857_C01)	<input type="text"/>
	Patient Identification Number	Patient Identification Number is required for HQR.	(CONF:CMS_0009)	<input type="text"/>

Figure 57. CMS Program Test

Similar to the C1 Record Sample test, prior to running the CMS Program Test, you are required to fill out an entry form of information to capture in your Health IT. The required information is specified in the CMS Implementation Guides for QRDA Category I and QRDA Category III. The specific conformance statement reference can be used to find the specific references in the appropriate CMS Implementation Guide. For example, HQR_PR requires that a system be able to report a patient's Medicare Health Insurance Claim Number (HICN).

You can demonstrate capturing this information by assigning a Medicare HICN of 1EG4TESMK73 to a test patient in your Health IT Module. Use the input form in Cypress to track the information that you entered in your Health IT Module. After entering all required information, **Save** the form shown in Figure 58. (Note that the example has only captured one of the seven required fields.)

Validated in QRDA	Data Criteria	Description	CMS IG Conformance Statement Reference	Recorded Value in Health IT
	CMS Certification Number	The organizations Facility CMS Certification Number (CCN). CCN is required for HQR.	(CONF:4444-28241_C01)	
	Medicare HIC Number	Medicare HIC Number is not required for HQR but should be submitted if the payer is Medicare and the patient has an HIC number assigned.	(CONF:4444- 16857_C01)	1EG4TESMK73
	Patient Identification Number	Patient Identification Number is required for HQR.	(CONF:CMS_0009)	
	Medicare Beneficiary Identifier	Medicare Beneficiary Identifier (MBI) is not required for HQR but should be submitted if the payer is Medicare and the patient has an MBI number assigned.	(CONF:4444- 28697_C01)	
	CMS EHR Certification ID	The Certified Health Information Technology (IT) Product List (CHPL) is the authoritative and comprehensive listing of health IT certified through the Office of the National Coordinator for Health Information Technology (ONC) Health IT Certification Program. A CMS EHR Certification Identification Number is a number generated by the CHPL and used for reporting to CMS.	(CONF:CMS_0005)	
	Tax Identification Number	For HQR, TIN may not be applicable. If TIN is submitted for HQR, then it SHALL conform to the constraints specified for TIN, and the TIN must be in valid format (9 decimal digits).	(CONF:4444-16593)	
	National Provider Identification number	For HQR, NPI may not be applicable. If NPI is submitted for HQR, then the NPI SHALL conform to the constraints specified for NPI and the NPI must be in the correct format.	(CONF:3364-28497)	

Save

Figure 58. Capture CMS-Specific Information

After saving, upload a .zip file with QRDA documents you created (in your Health IT) with the information specified in the form. (Note that the information does not need to be in a single QRDA document). Once the .zip file is uploaded, Cypress will verify that the expected information can be found in the uploaded QRDA files. When Cypress finds the required data criteria, a checkmark will indicate the data criteria has been found with a note indicating which file held the data criteria. For example, as shown in Figure 59, the Medicare HIC Number was found in the file 0_CVU_Patient.xml.

Validated in QRDA	Data Criteria	Description	CMS IG Conformance Statement Reference	Recorded Value in Health IT
	CMS Certification Number	The organizations Facility CMS Certification Number (CCN). CCN is required for HQR.	(CONF:4444-28241_C01)	
✓ (CVU Patient.xml)	Medicare HIC Number	Medicare HIC Number is not required for HQR but should be submitted if the payer is Medicare and the patient has an HIC number assigned.	(CONF:4444- 16857_C01)	1EG4TESMK73
	Patient Identification Number	Patient Identification Number is required for HQR.	(CONF:CMS_0009)	

Figure 59. Verifying CMS-Specific Information

In addition to finding the required data, Cypress performs additional validations described in the CMS Implementation Guide and performs measure calculation for the uploaded QRDA Category I documents. The results of these validations and calculations can be found by selecting **View Results** in Figure 60.

2 Upload Files

Upload results from the EHR system in the form of a zip file of QRDA Category I documents to get test results. This will automatically run a test execution.

Upload Results

View Results

Status

✖ Failing

Select file

Validated in QRDA	Data Criteria	Description	CMS IG Conformance Statement Reference	Recorded Value in Health IT
	CMS Certification Number	The organizations Facility CMS Certification Number (CCN). CCN is required for HQR.	(CONF:4444-28241_C01)	
✓ (CVU Patient.xml)	Medicare HIC Number	Medicare HIC Number is not required for HQR but should be submitted if the payer is Medicare and the patient has an HIC number assigned.	(CONF:4444- 16857_C01)	1EG4TESMK73
	Patient Identification Number	Patient Identification Number is required for HQR.	(CONF:CMS_0009)	
	Medicare Beneficiary Identifier	Medicare Beneficiary Identifier (MBI) is not required for HQR but should be submitted if the payer is Medicare and the patient has an MBI number assigned.	(CONF:4444- 28697_C01)	
	CMS EHR Certification ID	The Certified Health Information Technology (IT) Product List (CHPL) is the authoritative and comprehensive listing of health IT certified through the Office of the National Coordinator for Health Information Technology (ONC) Health IT Certification Program. A CMS EHR Certification Identification Number is a number generated by the CHPL and used for reporting to CMS.	(CONF:CMS_0005)	
	Tax Identification Number	For HQR, TIN may not be applicable. If TIN is submitted for HQR, then it SHALL conform to the constraints specified for TIN, and the TIN must be in valid format (9 decimal digits).	(CONF:4444-16593)	
	National Provider Identification number	For HQR, NPI may not be applicable. If NPI is submitted for HQR, then the NPI SHALL conform to the constraints specified for NPI and the NPI must be in the correct format.	(CONF:3364-28497)	

Save

Figure 60. View Results and Calculation for CMS Program Test

On the **View Results** page, you can view the validation errors for the uploaded documents and the measure calculations for the uploaded documents. Figure 61 shows validation error and measure calculations.

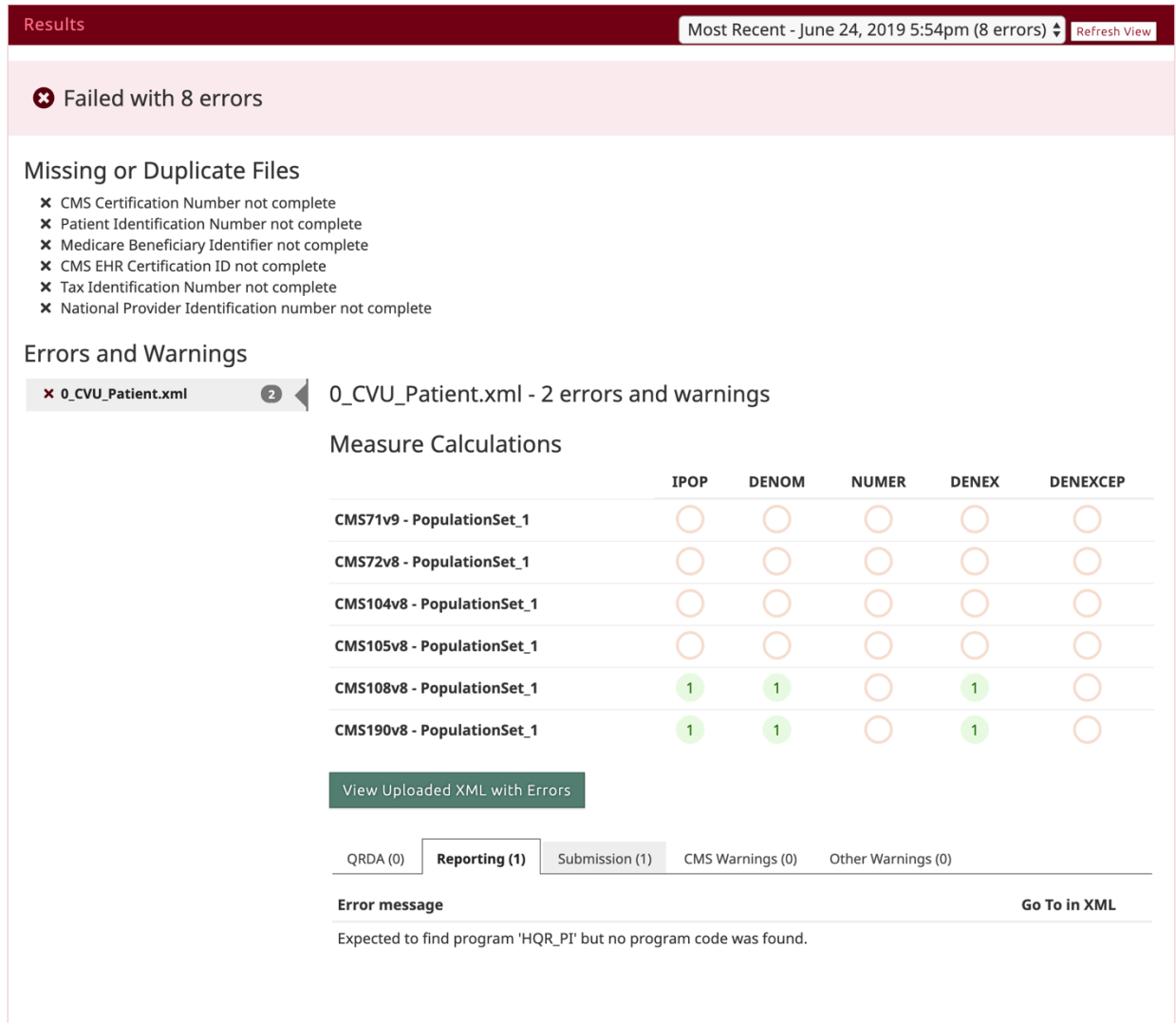


Figure 61. Validation Results and Measure Calculation

Acronyms

Acronym	Definition
FFRDC	Federally Funded Research and Development Center
ACO	Accountable Care Organization
ASTP	Assistant Secretary for Technology Policy/Office of the National Coordinator for Health Information Technology
ATL	Authorized Testing Lab
CMS	Centers for Medicare & Medicaid Services
CQM	Clinical Quality Measure
EC	Eligible Clinician
eCQI	Electronic Clinical Quality Improvement
eCQM	Electronic Clinical Quality Measure
EH	Eligible Hospital
FFRDC	Federally Funded Research and Development Center
HEALTH FFRDC	CMS Alliance to Modernize Healthcare
HHS	Department of Health and Human Services
HICN	Health Insurance Claim Number
HL7	Health Level Seven International
HTML	Hypertext Markup Language
IG	Implementation Guide
IT	Information Technology
NIST	National Institute of Standards and Technology
ONC	Office of the National Coordinator for Health Information Technology
QDM	Quality Data Model
QRDA	Quality Reporting Document Architecture
SUT	System Under Test
XML	Extensible Markup Language