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

CMS Alliance to Modernize Healthcare Federally Funded Research and Development Center



An Open Source Electronic Clinical Quality Measure Testing and Certification Tool

Supporting the 2014 ONC Certification Edition with Cypress v3

Draft

Version 0.1

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# **Record of Changes**

Version	Date	Author / Owner	Description of Change
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## 1. Introduction

Cypress v3.2 is the rigorous open source testing tool of Electronic Health Records (EHR) and EHR modules used in calculating electronic Clinical Quality Measures (eCQM). Cypress v3.2 is the official testing tool for the 2015 EHR Certification program supported by the Office of the National Coordinator for Health Information Technology (ONC). The 2015 Edition final rule, published by the ONC, updates the ONC Health Information Technology (IT) Certification Program and includes certification criteria to support repeatable electronic clinical quality measurement and reporting across the healthcare ecosystem. The 2015 Edition eCQM certification criteria also support the requirements of the Medicare and Medicaid EHR Incentive Programs and other Centers for Medicare & Medicaid Services (CMS) program requirements.

ONC and CMS developed the Cypress v3.2 User Guide for test proctors who test and certify EHR systems at Authorized Testing Labs (ATL). EHR 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 EHR product will perform in an ATL-conducted operational test.

Cypress 2.6.1 is the only version available for use with the 2014 Certification Edition. By design, Cypress 2.6.1 only supports the eCQMs published in 2014 by CMS. Therefore, vendors looking to certify to the 2014 Certification Edition are required to implement eCQMs that are not currently in use. As an alternative, this document describes how Cypress v3 can be configured for testing with the 2014 Certification Edition.

The two most significant differences between the 2014 Certification Edition and the 2015 Certification Edition are:

- 1. The 2015 Edition requirement to perform patient deduplication
- 2. The 2015 Edition C2 (import and calculate) requirement for automated QRDA import

It is possible to work around these two differences to achieve a 2014 certification by temporarily changing the administrative settings for the Cypress instance. This document describes the steps required to change the administrative settings in Cypress.

## 2. Steps to Update Cypress Configuration to Turn Off Patient Duplication

This section presents the required ten steps to change the administrative settings in Cypress.

Step 1: Log in with a User Account with Administrative Privileges

- An administrator account will have a link to the Admin page in the banner in Figure 1.
- Click on the **Admin** link to go to the **Admin Page**.

CYPRESS 3.2.2		📰 Dashboard	😁 Master Patient List	🐣 admin@testinglab.org	🕫 Admin	🕩 Log Out
Dashboard						
Vandars					+ /	Add Vendor
vendors						
Vendor	Products	💠 🗸 Passing 🕴 🕽	🕻 Failing 🕴 🕴 Errored	O Incomplete	÷	¢
2014 Vendor	+ Add Product				×	Edit Vendor

Figure 1. Screenshot of Vendor Dashboard

### Step 2: Go to Admin Page

- By default, Cypress will be running in **ATL mode** as shown in Figure 2.
- Select Edit Application Settings to modify the Application Mode.



Figure 2. Screenshot of Admin Page

### Step 3: Edit Application Settings

- By default, Cypress will be running in **ATL mode** as shown in Figure 3.
- Select **Custom** to change the default settings.

SUDLESS 3.2.2	📰 Dashboard	曫 Master Patient List	å admin@testinglab.org	🕫 Admin	🕩 Log O
Admin Edit Settings					
Edit Settings					
Banner					
This server is for demonstration purpose	s; data on it will be removed every Sa	turday at 11:59 PM Eastern	Time		
					le
Sign in Warning					
This warning banner provides privacy and	d security notices consistent with app	licable federal laws, directives system is pro-	es, and other federal guidance	e for accessing	this
Government system, which includes and		· · · · · ·		eu use only.	li.
Display banner/warning?					
Email Settings					
Cypress Instance URL				Instance Po	ort
localhost				3000	
SMTP Server				Port	
				4	
Mailer Domain					
Mailer Username					
Mailer Password					
1					
Application Mode					
O Demo					
O ATL					
Custom					
Edit Cathland					

Figure 3. Screenshot of Edit Settings (Original Settings)

### **Step 4: Select Custom Options**

- When first selected, the **Custom** settings will be the same as the original **ATL** settings.
  - Auto Approve, Ignore Roles, and Debug Features will all be set to Disable as shown in Figure 4.

#### Centers for Medicare & Medicaid Services / Office of the National Coordinator

Admin Edit Settings					
Late Sectings					
Edit Settings					
Banner					
This server is for demonstration purpose	es; data on it will be removed every Sa	aturday at 11:59 PM Eastern	Time		
Sign in Warning					
This warning banner provides privacy an Government system, which includes all o	nd security notices consistent with ap devices/storage media attached to thi	plicable federal laws, directions system. This system is pro	ves, and other federal guidance vided for Government-authori	e for accessing the for accessing the for accessing the formation of the f	nis
Display banner/warning?					
Email Settings					
Cypress Instance URL				Instance Po	rt
localhost				3000	
SMTP Server				Port	
Mailer Domain					
Mailer Username					
Mailer Password					
Application Mode					
🔿 Internal					
🔿 Demo					
ATL     Custom					
Custom Mode Options					
Auto Approve C Enable O Disable					
Ignore Roles O Enable <b>O</b> Disable					
Debug Features O Enable 🧿 Disab	ble				
Default role					
(					\$
None					
None					

Figure 4. Default Settings

### Step 5: Enable Debug Features

- Clicking **Enable** for **Debug Features** enables turning off patient duplication when creating a new Product.
- Click **Edit Settings** to save the changes as shown in Figure 5.

#### Centers for Medicare & Medicaid Services / Office of the National Coordinator

Admin Edit Settings					
Admin Luit Settings					
Edit Settings					
Banner					
This server is for demonstration purpos	es; data on it will be removed every Sa	iturday at 11:59 PM Eastern	Time		
Sign in Warning					te.
This warning banner provides privacy a Government system, which includes all	nd security notices consistent with app devices/storage media attached to thi	olicable federal laws, directions system. This system is pro	ves, and other federal guidance vided for Government-authoriz	e for accessing zed use only.	this //
Display banner/warning?					
Email Settings					
Cypress Instance URL				Instance Po	ort
localhost				3000	
SMTP Server				Port	
Mailer Domain					
Mailer Username					
Mailer Password					
Mailer Password					
Mailer Password Application Mode					
Mailer Password Application Mode					
Mailer Password Application Mode Internal Demo					
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Mailer Password Application Mode Internal Demo ATL Custom Mode Options Auto Approve Enable Disable Debug Features Enable Disable Debug Features Enable Disa	e ble				•

Figure 5. Enable Debug Features

### Step 6: Add a New Vendor and Product

- Once the settings have been saved, a new product can be created with patient duplication turned off.
- Add a product to an existing (or new) vendor by clicking the **Add Product** button as shown in Figure 6.

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CYPICSS 3.2.2		📰 Dashboard	曫 Master Patient List	å admin@testinglab.org	🕫 Admin	🗭 Log Out
Dashboard						
Vandara					+	Add Vendor
vendors						
Vendor	Products	✓ Passing	🗙 Failing 🕴 🚦 Errored	O Incomplete	¢.	¢
A 2014 Vender	Add Broduct					Edit Vandas
						FEDIL VENDOF I

Figure 6. Add Product to a Vendor

## Step 7: Take Note of Default Options

• By default, **Duplicate Records** will still be enabled, as shown in Figure 7.

Dashboard Vendor: 2014 Vendor Add Product	
Add Product	
Name	Records Options
	Randomize Records
Version	Duplicate Records
	Recommended for most robust testing.
Description	Annual Update Bundle
	<ul> <li>2017 Bundle for the 2018 Reporting Period (w/ Sept 2017 Addendum) 2017.0.2</li> </ul>
Certification Types	2016 Bundle for the 2017 Reporting Period 2016.0.2
C1 Test	Select the measure versions Cypress should use to certify this product.
C2 Test	Shift Records
C3 Test	Selecting Shift Records will move patient data forward into the appropriate
C4 Test	reporting period. Otherwise patient data will remain in a previously completed calendar year.
Select the certification type Cypress should use to certify this product	Measures Options
	O Eligible Hospital eCQMs
	C 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 speci individual measures.

Figure 7. Create Product (Default Options)

## Step 8: Deselect Duplicate Records

- Patient duplication can be turned off by deselecting **Duplicate Records**.
- Please note that "C4" is still a certification option in Figure 8even though C4 is not applicable to the 2014 ONC Certification.

• Cypress v3 can only be used with the 2015, 2016, and 2017 measure bundles. These bundles require newer standards than the one specified in the 2014 Certification Edition.

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board vehicult. 2014 vehicult Add Flodact					
l Product					
ne		Records Options			
ests without duplicate records		Randomize Record	rds		
sion		Duplicate Record	s		
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cription		Annual Update Bundl	e		
••• ■ 000000		<ul> <li>2017 Bundle for Addendum) 2017</li> </ul>	the 2018 Reporting Period ( .0.2	w/ Sept 2017	
tification Types		2016 Bundle for	the 2017 Reporting Period 2	2016.0.2	
C1 Test		Select the measure versi	ons Cypress should use to certify	y this product.	
C2 Test		Chift Decords			
C2 TEST		Shirt Records			
C4 Test		reporting period. Otherw calendar year.	viii move patient data jorward ii vise patient data will remain in i	nto the appropriate a previously completed	t)
ct the certification type Cypress should use to certify	this product	Measures Options			
		C Eligible Hospital	eCQMs		
		C Eligible Professio	onal eCQMs		
		All eCOMs			
		Curter.			
		Custom			
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elect Custom Measures 3.✔ Type to filter by measure		Indicate the clinical qua Testing will be performe individual measures.	lity measures Cypress should us d on a measure-by-measure ba:	e to certify this product sis. Click 'Custom' to sp Clear a	t. recify
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elect Custom Measures 3 ✓  Type to filter by measure  Type a keyword or CMS ID of a measure  Acute Myocardial Infarction (1 EH)  Acute Myocardial Infarction (1 EH)  Behavioral Health General (1 EP)  Behavioral Health General (1 EP)  Behavioral Health Pediatric (1 EP)  Core (18 EP)  Diabetes (5 EP)  Emergency Department (3 EH)  Sye (4 EP)  General Practice Adult (7 EP)  General Practice Adult (7 EP)  Heart (4 EP)  Newborn (2 EH)  Orthogodics (2 EP)  Pregnancy (1 EP, 1 EH)	3↓ CMS8 CMS1 CMS1 CMS1 CMS1 CMS1 CMS1 CMS1 CMS1 CMS1 CMS1 CMS1	Indicate the clinical qua Testing will be performe individual measures. t all 7 Behavioral Health A 28v6 Anti-depression 28v6 Anti-depression 28v6 Anti-depression the 37v6 Initiation and Engan dence Treatment (EP) 59v6 Depression Utilizati 60v6 Depression Utilizati 61v6 Adult Major Depres siment (EP) 69v6 Bioplar Disorder an ical substance use (EP)	lly measures Cypress should us d on a measure-by-measure ba Adult measures Screening (EP) dication Management (EP) gement of Alcohol and Othe on at Twelve Months (EP) on of the PHQ-9 Tool (EP) sive Disorder (MDD): Suicid d Major Depression: Apprai	e to certify this product sis: Click 'Custom' to sp Clear 4 er Drug e Risk isal for alcohol or	t. Hecify

Figure 8. Create Product without Patient Duplication

Step 9: Each Individual Test Exposes 'Get Known Good Result'

- One of the ramifications to enabling **Debug Features** is that the **Get Known Good Results** feature will be available for each test.
- IMPORTANT!! If your Cypress version is accessible to vendors, then the vendors will also be able to Get Known Good Results. When this is the case, immediately switch the Application Mode back to ATL after creating the product.

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CYPIESS 3.2.2	III Dashboard	😬 Master Patient List	📥 admin@testinglab.org	¢\$ Admin	🗭 Log Ou
Dashboard Vendor: 2014 Vendor Product: Test wi	thout duplicate records	• Test: Maternal Depres	ion Screening		
C1 C2 C3					
H Previous Test: CMS82v5				Next Test: C	MS82v5 🕅
Measure Test Information	C1 ar	nd C3	C2 a	and C3	
Measure: Maternal Depression Screening HQMF ID: 40280382-5ABD-FA46-015B- 4982128438CB CMS ID: CMS82v5	QRDA Errors Reporting Errors Submission Errors Warnings Execution Date	: : :	QRDA Erro Reporting Erro Submission Erro Warning Execution Dat	rs rs rs gs	
Provider Name: Bennett, Timothy Provider NPI: 1866439551 Provider TIN: 433448034 Provider CCN: 465752			s	start	
View Patients Get Known Good Result					
1 🕴 Download Test Deck		2 🕴 Upload Files			
Download and import this data into your EHR clinical qu calculator.	ality measure	Upload results from th documents to get test	e EHR system in the form of a z results. This will automatically r	ip file of QRDA run a test exect	Category I ution.
🛓 Download QRDA Category I (.zip)				<b>№</b> 5	Select file

Figure 9. Get Known Good Results on a Test Page

Step 10: Return Settings to ATL Mode

• The Application Mode can be switched back to ATL mode by going to the Admin Page, clicking on Edit Application Setting (as shown in Figure 3) and selecting ATL as the Application Mode.

## 3. Supporting Manual Entry in Cypress v3

The decision to create measure-specific test decks (instead of a single test deck for each measure) derives from the 2015 Edition C2 (import and calculate) requirement for automated QRDA import and the desire to increase the measure logic coverage in Cypress. When an ATL uses the **Download Full Test Deck** button (as shown in Figure 10), the generated zip file will only contain the QRDA files for the test patients. To support users who do not have the ability to import QRDA files, the test proctor can provide HTML versions of the test patients. Unfortunately, there is no single button available for this action. Instead, a test proctor must go to each individual test and download the HTML files from the View Patients page. The following two steps describe how to download the HTML patient files.

## Step 1: Go to Individual Test

• Each C1, C2, C3, and C4 test page has a link to **View Patients** as shown in Figure 10.

Centers for Medicare & Medicaid Services / Office of the National Coordinator

CYPRESS 3.2.2	📰 Dashboard	😁 Master Patient List	🚢 admin@testinglab.org	🕫 Admin	🕩 Log Ou
Dashboard Vendor: 2014 Vendor Product: Tests wi	thout duplicate records	• Test: Maternal Depres	sion Screening		
C1 C2 C3			ſ	New Tech Ch	10120-JC N
N Previous lest: CMS137V6	C1 ar	nd C3	C2	and C3	15128v6 M
INTEASURE LEST INFORMATION Measure: Maternal Depression Screening HQMF ID: 40280382-5ABD-FA46-015B- 4982128438CB CMS ID: CMS82v5 Provider NAme: Rodriguez, Veronica Provider NPI: 1035572738 Provider TIN: 068696380 Provider CCN: 186757 View Patients	QRDA Errors Reporting Errors Submission Errors Warnings Execution Date		QRDA Erro Reporting Erro Submission Erro Warnin Execution Da	rs rs gs gs start	
1 🕴 Download Test Deck		2 🕴 Upload Files			
Download and import this data into your EHR clinical qua calculator.	lity measure	Upload results from th documents to get test	e EHR system in the form of a a results. This will automatically	tip file of QRDA run a test exect	Category I ution. elect file

Figure 10. View Patients for Individual Test

Step 2: Download HTML Records Using View Patients

- The **View Patients** page shows a listing of the patients in the Cypress test deck (Figure 11).
- The **Download HTML Patients** button will download a zip file including an HTML representation of all patients in the measure specific test deck.

CYPERSS 3.2.2		🖽 Dashboard 🛛 👻 Master	Patient List 🛛 🚨 adn	nin@testinglat	o.org 😋 Adm	in 🕒 Log Ou
Dashboard Vendor:	2014 Vendor Product: Tests w	vithout duplicate records Test: Ma	ternal Depression Scre	ening Patie	nt List	
Patient List						
					📥 Download	HTML Patients
CMS82v5 Mate	rnal Depression Sci	reening Patients				
Patient Name	Template Name	DOB	Gender	IPOP	DENOM	NUMER
Allan Nguyen	Z3 N Eye	February 11, 1966	Male			
Carole Shaw	1 AMI	December 13, 1948	Female			
Connie Meyer	A BH Infant	November 1, 2015	Female	0	0	
Henry Poole	Z15 N GP Adult	February 16, 1968	Male			
Kathleen Obrien	Z15 GP Peds	June 5, 2014	Female			
Lonnie Wagner	1 BH Infant	May 16, 2016	Male	0	0	0
Nathan Price	Z10 GP Peds	August 13, 2014	Male			
Ruby Fields	B BH Infant	November 1, 2015	Female	0	0	0

Figure 11. View Patients with Download HTML

## Acronyms

ATL	Authorized Testing Lab			
CMS	Centers for Medicare & Medicaid Services			
CQM	Clinical Quality Measure			
eCQM	Electronic Clinical Quality Measure			
EHR	Electronic Health Record			
HTML	Hypertext Markup Language			
ONC	Office of the National Coordinator for Health Information Technology			
QRDA	Quality Reporting Document Architecture			