



Measure Authoring Tool 6.03 QDM and FHIR

MAT 6.03 QDM and MAT 6.03 FHIR

Release Notes

Scheduled Release 12/15/2020

Dec 15, 2020

The MAT Bonnie Team



MAT 6.03 FHIR

FHIR Measure and Library Updates

The MAT 6.03 QDM and FHIR release contains the following Updates:

FHIR is Available for all MAT Measure Developers

- Measure developers working in MAT 6.03 QDM and FHIR will see (FHIR) in the MAT header.
- These measure developers will be able to build and maintain FHIR measures and libraries as well as QDM.

Select	Measure Name	Model Version	Version	Models
<input type="checkbox"/>	Discharged on Antithrombotic Therapy	4.0.1	Draft v0.0.002	FHIR / CQL
<input type="checkbox"/>	CMS 111	4.0.1	Draft v0.0.003	FHIR / CQL

The MAT User is editing a QDM Measure:

The screenshot displays the 'Measure Authoring Tool v6.02 (FHIR)' interface. At the top, there are navigation tabs: 'Measure Library', 'Measure Composer', 'CQL Library', and 'CQL Composer'. The 'Measure Composer' tab is selected and highlighted with a red oval. Below the tabs, the main content area shows a measure titled '!! Demo 08/07/2018 Draft v0.0.006 (QDM / CQL)'. The 'QDM / CQL' part of the title is highlighted in yellow. Below the title, there are several tabs: 'Measure Details', 'CQL Workspace', 'Population Workspace', 'Measure Packager', 'Clause Workspace', and 'QDM Elements'. The 'Measure Details' tab is selected. On the left side, there is a sidebar with a 'Delete Measure' button and a 'General Measure Information' section. The 'General Measure Information' section is expanded, showing a list of fields: 'Measure Steward / Developer', 'Description', and 'Copyright'. The 'Measure Steward / Developer' field has a green checkmark. The main content area shows the 'General Measure Information' form with the following fields: 'Measure Name (*)' (containing '!! Demo 08/07/2018'), 'eCQM Abbreviated Title (*)' (containing 'DemoAug'), 'Measure Scoring (*)', and 'Patient-based Measure (*)'. There is also a 'View Human Readable' button on the right side of the form.

The MAT User is editing a FHIR Measure:

The screenshot displays the 'Measure Authoring Tool v6.02 (FHIR)' interface. At the top, there are navigation tabs: 'Measure Library', 'Measure Composer' (selected), 'CQL Library', and 'CQL Composer'. The main content area shows a measure titled 'NewFHIRMeasure Draft v0.0.000 (FHIR / CQL)', which is highlighted in yellow and circled in red. Below the title, there are several tabs: 'Measure Details' (selected), 'CQL Workspace', 'Population Workspace', 'Measure Packager', 'Clause Workspace', and 'QDM Elements'. On the left side, there is a 'Delete Measure' button. On the right side, there is a 'View Human Readable' button. The 'General Measure Information' section is expanded, showing a 'Measure Steward / Developer' field with a green checkmark and a 'Description' field. The 'General Measure Information' section also includes two input fields: 'Measure Name (*)' with the value 'NewFHIRMeasure' and 'eCQM Abbreviated Title (*)' with the value 'NewFHIRMeasure'.

New FHIR Features: Run FHIR Validation and Convert to FHIR

- Run FHIR Validation: Displays a report in a separate browser tab of remaining FHIR syntax errors that must be corrected for the selected measure.
- Convert to FHIR: Allows the user to convert a versioned QDM/CQL measure to FHIR. A draft FHIR measure is created when this action is performed.

The screenshot shows the 'My Measures' interface. At the top, there is a filter button 'Filter by: My Measures' and a 'Reset' link. Below this, there are navigation controls showing '1-6 of 6' and '1 Item Selected' with a 'Clear Item' link. The main area is titled 'My Measures' and contains a toolbar with buttons for 'Create Version', 'History', 'Edit', 'Share', 'Clone', 'Export', 'Run FHIR Validation', and 'Convert to FHIR'. The 'Run FHIR Validation' and 'Convert to FHIR' buttons are circled in red. Below the toolbar is a table with the following data:

Measure Name	Version	Version	Models
<input checked="" type="checkbox"/> CP347	4.0.1	Draft v0.0.000	FHIR / CQL
<input type="checkbox"/> CPMeas1	4.0.1	Draft v0.0.000	FHIR / CQL
<input type="checkbox"/> FHIR_KC1	4.0.1	Draft v0.0.000	FHIR / CQL

MAT 6.03 QDM and FHIR Release Notes

Measure History and Library History:

- Displays when a measure or library was converted to FHIR, the time and date it was converted and the person who converted it.

The screenshot shows the 'Measure Authoring Tool v6.0 (FHIR)' interface. At the top, there are navigation tabs: 'Measure Library' (selected), 'Measure Composer', 'CQL Library', and 'CQL Composer'. On the right, there are links for 'Sign in to UMLS' and 'Sign in to Bonnie', along with a user profile icon. The main content area is titled 'My Measures > History' and displays a specific measure: 'Measure: !! Demo 08/07/2018'. Below this, there is a 'Log Entry' table with the following data:

User Action	Last Modified By	Last Modified Date	Additional Information
Converted from QDM/CQL to FHIR	Luke Skywalker	08/11/2020 3:44:51 PM CST	QDM measure Demo08072018
Measure Created	Luke Skywalker	08/11/2020 3:44:44 PM CST	

At the bottom of the table, there are navigation controls: a back arrow, a left arrow, '1-2 of 2', a right arrow, and a forward arrow.

MAT 6.03 QDM and FHIR Release Notes

Now displaying Models in Measure and CQL Library grids:

- This column contains the models and expression logic of the measure: QDM / QDM, QDM / CQL or FHIR/CQL.

Measure	Model	Expression Logic
QDM / QDM	QDM	QDM
QDM / CQL	QDM	CQL
FHIR / CQL	FHIR	CQL

My Measures

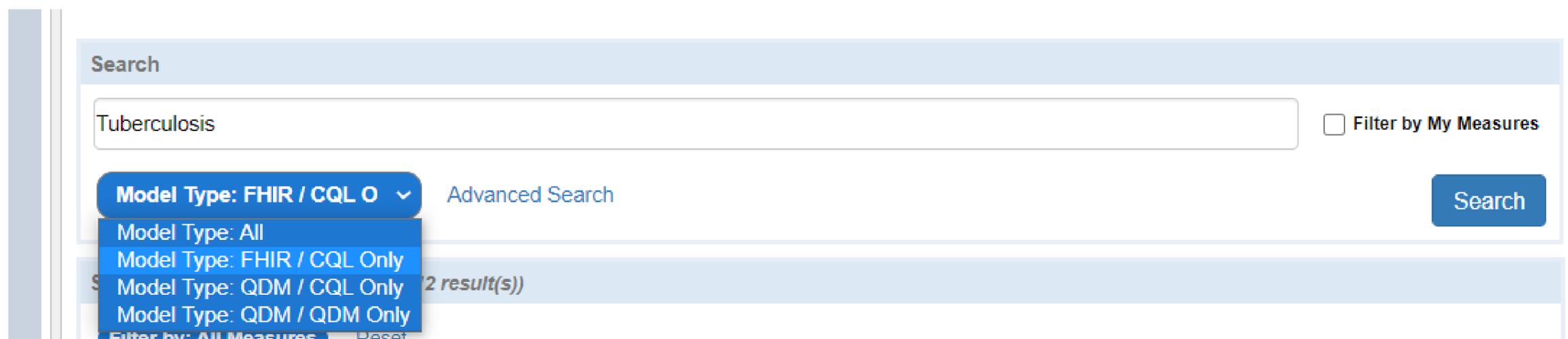
★ Create Version or Draft
🕒 History
✎ Edit
🔗 Share
📄 Clone
📄 Export
📄 Run FHIR Validation
🔄 Convert to FHIR

Measure Name	Model Version	Version	Models
<input type="checkbox"/> CP347	4.0.1	Draft v0.0.000	FHIR / CQL
<input type="checkbox"/> CPMeas1	4.0.1	Draft v0.0.000	FHIR / CQL
<input type="checkbox"/> FHIR_KC1	4.0.1	Draft v0.0.000	FHIR / CQL
<input type="checkbox"/> NoDaysDistalFracture	5.5	Draft v0.0.000	QDM / CQL

MAT 6.03 QDM and FHIR Release Notes

Enhanced Search for Measure and CQL Library grids:

- Filter by All model types
- **Filter specifically for FHIR/CQL model type**
- Filter specifically for QDM/CQL model type
- Filter specifically for QDM/QDM model type
- This search filter can be combined with other search filters



The screenshot displays a search interface with the following elements:

- Search** header
- Search input field containing "Tuberculosis"
- Filter by My Measures
- Model Type: FHIR / CQL O** dropdown menu (expanded) with options:
 - Model Type: All
 - Model Type: FHIR / CQL Only
 - Model Type: QDM / CQL Only
 - Model Type: QDM / QDM Only
- Advanced Search
- Search button
- 2 result(s)
- Filter by: All Measures
- Reset

MAT 6.03 QDM and FHIR Release Notes

Create a New Measure or New CQL Library:

- Choose the Model Type: FHIR or QDM

Measure Authoring Tool v6.0 (FHIR)

Measure Library
Measure Composer
CQL Library
CQL Composer

My Measures > Create New Measure

All fields are required.

Measure Name *

Model *

FHIR

QDM

CQL Library Name *

WARNI
with zip

Measure Authoring Tool v6.0 (FHIR)

Measure Library
Measure Composer
▶ CQL Library
CQL Co

My CQL Library > Create New CQL Library

Enter a CQL Library name. Then continue to the CQL Composer.

CQL Library Name *

Model *

FHIR

QDM

Save and Continue
Cancel

MAT 6.03 QDM and FHIR Release Notes

FHIR Measures have new required fields:

- Experimental (defaults to No)
- Population Basis

FHIR Measure Scoring:

- Please do NOT use Ratio at this time
- When standards are complete Ratio functionality will be added for FHIR measures

Delete Measure
View Human Readable

General Measure Information	General Measure Information
Measure Steward / Developer <input checked="" type="checkbox"/>	Measure Name Venous Thromboembolism Prophylaxis
Description <input checked="" type="checkbox"/>	eCQM Abbreviated Title CMS999
Copyright <input checked="" type="checkbox"/>	Measure Scoring Proportion
Disclaimer <input checked="" type="checkbox"/>	Patient-based Measure No
Measure Type <input checked="" type="checkbox"/>	Finalized Date <input type="text"/>
Stratification <input checked="" type="checkbox"/>	GUID 38b0b5ec-0f63-466f-8fe3-2cd20ddd1622
Risk Adjustment <input checked="" type="checkbox"/>	Population Basis Observation
Rate Aggregation <input checked="" type="checkbox"/>	eCQM Version Number Draft v9.1.000
Rationale <input checked="" type="checkbox"/>	eCQM Identifier (Measure Authoring Tool) 1046 Generate Identifier
Clinical Recommendation <input checked="" type="checkbox"/>	Endorsed By NQF NQF Number No <input type="text"/> Not Applicable
Improvement Notation <input checked="" type="checkbox"/>	Measurement Period <input checked="" type="checkbox"/> Next Calendar Year
References <input checked="" type="checkbox"/>	From 01/01/2021 To 12/31/2021
Definition <input checked="" type="checkbox"/>	
Guidance <input checked="" type="checkbox"/>	
Transmission Format <input checked="" type="checkbox"/>	
+ Populations <input checked="" type="checkbox"/>	
Supplemental Data Elements <input checked="" type="checkbox"/>	

Save

MAT 6.03 QDM and FHIR Release Notes

FHIR Measure Measurement Period has two options:

- Next Calendar Year defaults to next calendar year.
- Custom Date Range

Measurement Period

Next Calendar Year

From  To 

Measurement Period

Next Calendar Year

From  To 

FHIR Measure Improvement Notation has two options:

- Specify Increase or Decrease

Improvement Notation

increase 
 increase
 decrease

MAT 6.03 QDM and FHIR Release Notes

Reference Type:

- Required for each reference added to a Measure. Choices are: Citation, Documentation, Justification.
- The default reference type is Citation.

References

Description	Reference Type	Edit	Delete
Lorem ipsum dolor sit amet, consectetur...	Citation		

1-1 of 1

Reference Type:

Citation ▼

Citation

Documentation

Justification

Unknown

Improvement Notation	Lower scores means higher quality.
Reference	Reference Type: CITATION Reference Text: 'Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.'
Definition	

90-day re-operation rates in distal radius fractures. Draft v0.0.000

Measure Details
CQL Workspace
Population Workspace
Measure Packager
Clause Workspace
QDM Elements

Delete Measure
View Human Readable

<ul style="list-style-type: none"> General Measure Information ✔ Measure Steward / Developer ⊕ Description ✔ Copyright ✔ Disclaimer ✔ Measure Type ✔ Stratification ✔ Risk Adjustment ✔ Rate Aggregation Rationale ✔ Clinical Recommendation Improvement Notation ✔ 	<p>References</p> <div style="border: 1px solid gray; padding: 5px; min-height: 100px;"> <p> Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.</p> </div> <p>Reference Type: Citation ▼</p>
---	---

References
Cancel
Save

Save FHIR CQL with Errors:

- Unlike QDM/CQL measures, FHIR Measure CQL code can be saved when it has errors. Severe FHIR syntax errors may cause some CQL to be hidden until the error is corrected.
- The save-time message indicates the state of the CQL.

The screenshot shows the 'CQL Workspace' tab selected in the top navigation bar. Below the navigation bar, a red message box contains the following text: 'The CQL file was saved with errors. Please correct the syntax errors so the CQL can be validated.' Below the message box, the breadcrumb 'CQL Workspace > CQL Library Editor' is visible, along with an 'Export Error File' button and an 'Information' icon. The main editor area shows the start of a CQL file with the text 'library FHIRRefType version '0.0.000''.

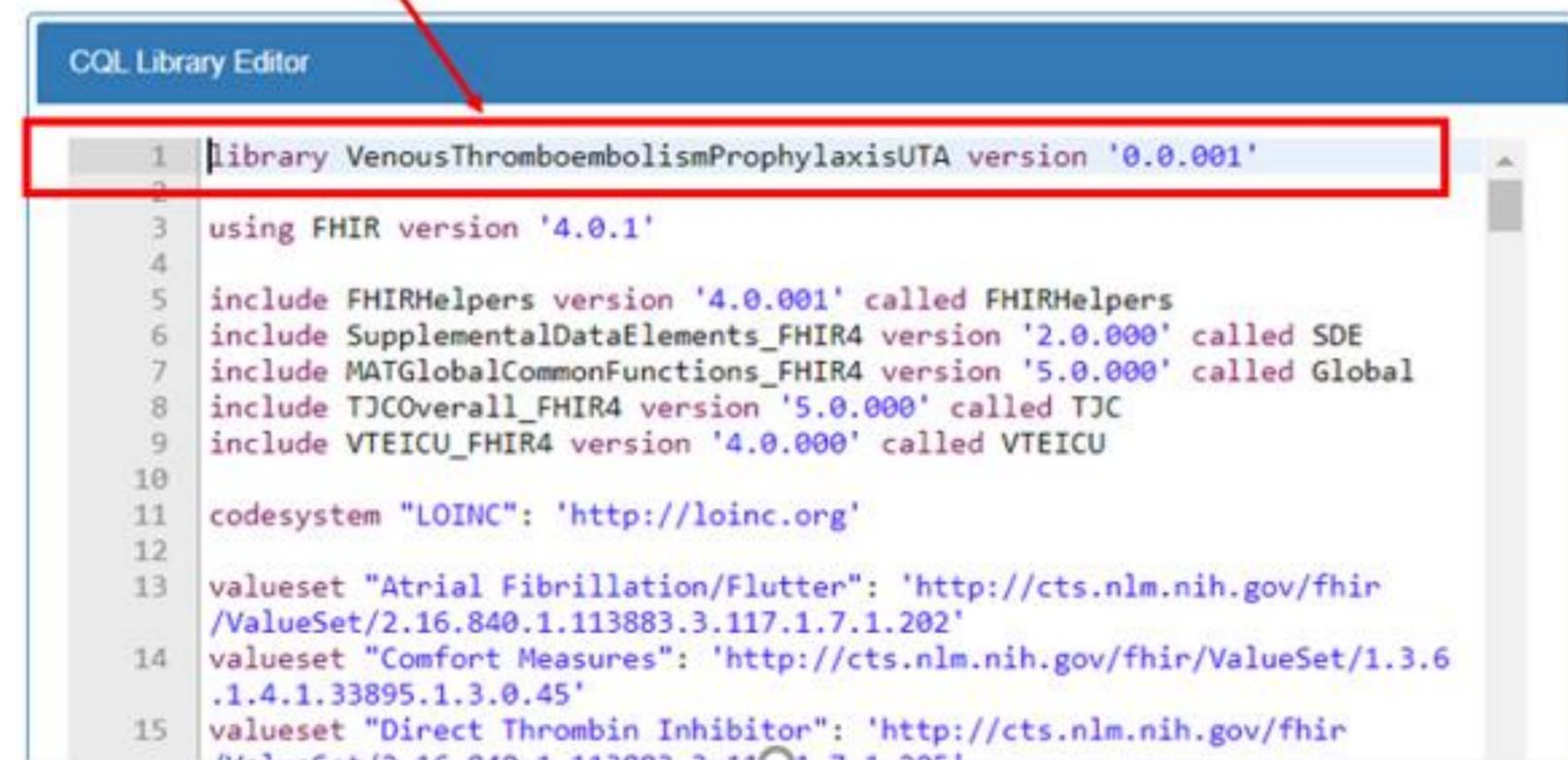
The screenshot shows the 'CQL Workspace' tab selected in the top navigation bar. Below the navigation bar, a green message box contains the following text: 'Changes to the CQL File have been successfully saved.' Below the message box, the breadcrumb 'CQL Workspace > CQL Library Editor' is visible, along with an 'Export Error File' button and an 'Information' icon. The main editor area shows the start of a CQL file with the text 'library FHIRRefType version '0.0.000'' and 'using FHIR version '4.0.1''.

MAT 6.03 QDM and FHIR Release Notes

Importing FHIR Measures:

- You can now import entire FHIR measures into the editor. Refer to the User Guide for details. This is only available in FHIR.
- On Save, the measure will be built. You'll be notified if the CQL was saved with errors or saved with no errors.
- If FHIR CQL contains severe errors, a portion of the CQL may not be visible until the severe errors are corrected.
- FHIR Value Sets and Code Systems can be entered directly in the editor.
- Make sure you're logged into VSAC when creating and editing measures.

The FHIR measure's Name cannot be modified in the CQL editor but everything else can.

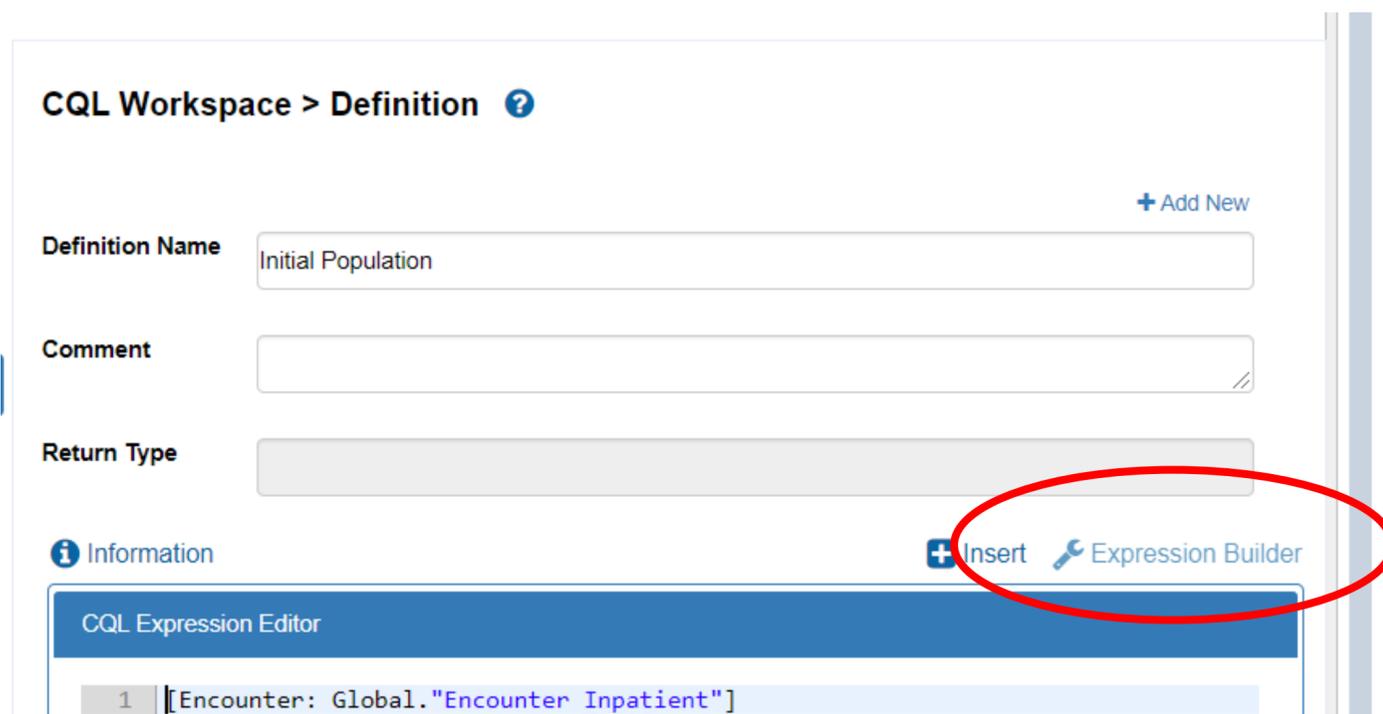
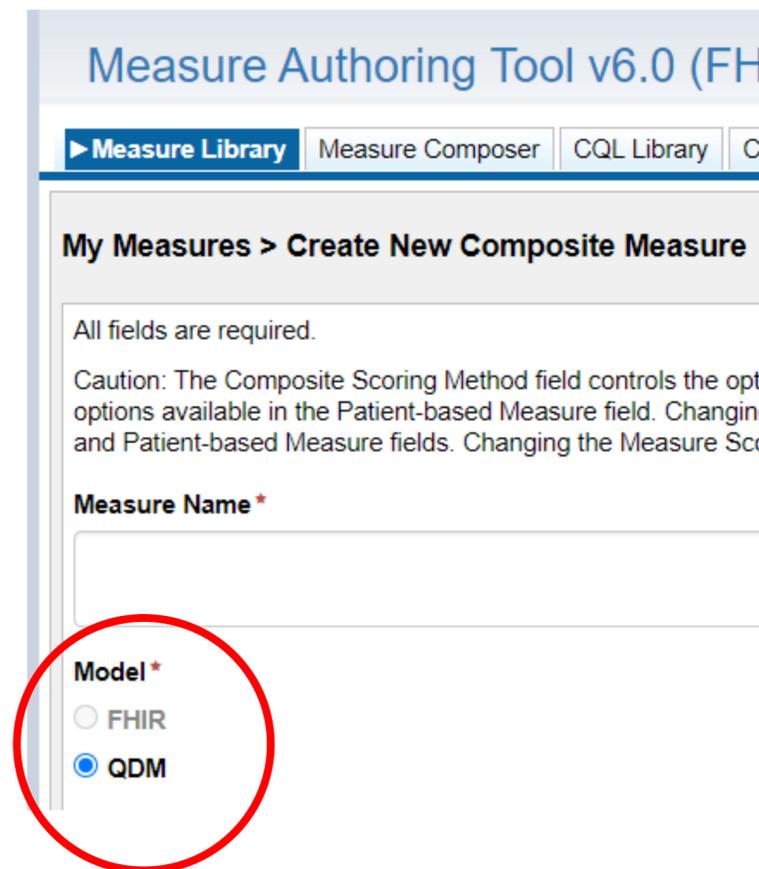
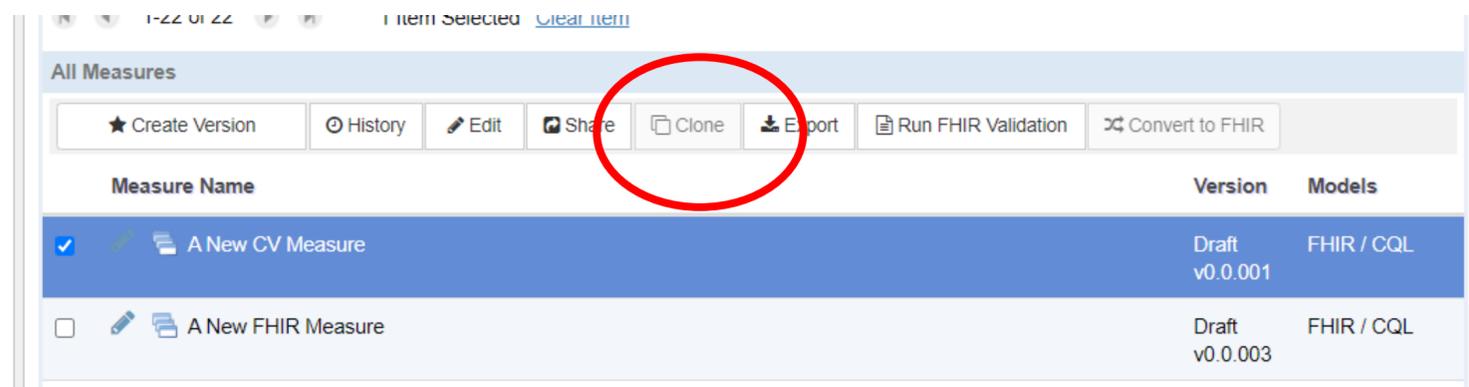


```
1 library VenousThromboembolismProphylaxisUTA version '0.0.001'
2
3 using FHIR version '4.0.1'
4
5 include FHIRHelpers version '4.0.001' called FHIRHelpers
6 include SupplementalDataElements_FHIR4 version '2.0.000' called SDE
7 include MATGlobalCommonFunctions_FHIR4 version '5.0.000' called Global
8 include TJCOverall_FHIR4 version '5.0.000' called TJC
9 include VTEICU_FHIR4 version '4.0.000' called VTEICU
10
11 codesystem "LOINC": 'http://loinc.org'
12
13 valueset "Atrial Fibrillation/Flutter": 'http://cts.nlm.nih.gov/fhir/ValueSet/2.16.840.1.113883.3.117.1.7.1.202'
14 valueset "Comfort Measures": 'http://cts.nlm.nih.gov/fhir/ValueSet/1.3.6.1.4.1.33895.1.3.0.45'
15 valueset "Direct Thrombin Inhibitor": 'http://cts.nlm.nih.gov/fhir/ValueSet/2.16.840.1.113883.3.117.1.7.1.205'
```

MAT 6.03 QDM and FHIR Release Notes

FHIR Measures do not currently allow the following actions. They are disabled:

- Composite Measures
- Cloning
- Expression Builder



MAT 6.03 QDM and FHIR Release Notes

FHIR Measures must:

- Use FHIR syntax.
- Include only FHIR libraries.
- Use FHIR Value Sets and Code Systems.
- All UI reflects FHIR options, resources Value Sets, Code Systems and attributes.
- Refer to the MAT on FHIR User Guide for details.

Measure Authoring Tool v6.0 (FHIR) ● Sign in to UMLS ● Sign

Measure Library **▶ Measure Composer** CQL Library CQL Composer

Venous Thromboembolism Prophylaxis Draft v9.1.000 (FHIR / CQL)

Measure Details **▶ CQL Workspace** Population Workspace Measure Packager Clause Workspace QDM Elements

General Information

- Includes 05
- Value Sets 39
- Codes 02
- Parameter 01
- Definition 39
- Function 00
- CQL Library Editor

CQL Workspace > General Information ? Save

CQL Library Name
VenousThromboembolismProphylaxis

CQL Library Version
4.0.1

Using Model
FHIR / CQL

Model Version
4.0.1

Comments

MAT 6.03 QDM and FHIR Release Notes

Packaging FHIR Measures produces FHIR bundles.

The FHIR Exports generated during packaging include XML, JSON and Human Readable files.

My Measures > Export

Export

Measure: [Export_Testing_on_Fhir_Measure](#)

Select an export option:

XML

JSON

Human Readable

All

Save **Open** **Cancel**

MAT 6.03 QDM and FHIR Release Notes

Bulk Export: Users will click the Export button to perform bulk exports.

- Select the measure(s) you wish to export and click the toolbar Export button.
- You can include both QDM and FHIR measures in one bulk export.

The screenshot shows a web application interface for managing measures. At the top, there is a search criteria bar indicating 62 results. Below this, there are filter buttons for 'All Measures' and 'Measures State: Versioned', along with a 'Reset' button. A navigation bar shows '26-50 of 62' items, '3 Items Selected', and a 'Clear Items' link. The main section is titled 'All Measures' and contains a toolbar with buttons for 'Create Version or Draft', 'History', 'Edit', 'Share', 'Clone', 'Export', 'Run FHIR Validation', and 'Convert to FHIR'. Below the toolbar is a table of measures with columns for 'Measure Name', 'Model Version', 'Version', and 'Models'. Three rows are selected, each with a blue checkmark in the selection column.

	Measure Name	Model Version	Version	Models
<input type="checkbox"/>	FhirDraftMeasure1593699256275	4.0.1	v1.0	FHIR / CQL
<input checked="" type="checkbox"/>	FhirMeasureTesting001234	4.0.1	v1.0	FHIR / CQL
<input checked="" type="checkbox"/>	Fhufjdfjvfnfjkb	4.0.1	v2.0	FHIR / CQL
<input checked="" type="checkbox"/>	Fhufjdfjvfnfjkb	4.0.1	v1.0	FHIR / CQL

CQL Libraries: Convert to FHIR

- To convert a CQL library to FHIR, select the grid row and click the Convert to FHIR button.

CQL Library New Library

Recent Activity

★ Create Version or Draft History Edit Share Delete **Convert to FHIR**

CQL Library Name	Model Version	Version	Models
<input type="checkbox"/> _1590676948005QDM1590676948006	5.5	Draft v0.0.000	QDM / CQL
<input type="checkbox"/> _1590171928069QDM1590171928072	5.5	Draft v0.0.000	QDM / CQL

Search

Search by Library Name or Owner Filter by My Libraries

Model Type: All Advanced Search **Search**

Search Criteria (Search returned 2694 result(s))

Filter by: All Libraries Reset

All CQL Libraries

★ Create Version History Edit Share Delete **Convert to FHIR**

1-25 of 2,694

CQL Library Name	Model Version	Version	Models
<input type="checkbox"/> 9sDa	4.0.1	Draft v0.0.000	FHIR / CQL
<input type="checkbox"/> _ sdf DF	4.0.1	Draft v0.0.000	FHIR / CQL
<input type="checkbox"/> _1590171928069QDM1590171928072	5.5	Draft v0.0.000	QDM / CQL
<input checked="" type="checkbox"/> _1590676948005fhir1590676948005		Draft v0.0.000	FHIR / CQL
<input type="checkbox"/> _1590676948005QDM1590676948006	5.5	Draft v0.0.000	QDM / CQL

MAT 6.03 QDM and FHIR Release Notes

FHIR CQL Library General Information tab includes new required fields:

- Experimental
- Description
- Publisher (Steward)

The screenshot shows the 'CQL Library Workspace' interface for 'AdultOutpatientEncounters_FHIR4 v2.0 (FHIR / CQL)'. The 'General Information' tab is active, showing the following fields:

- CQL Library Name:** AdultOutpatientEncounters_FHIR4
- CQL Library Version:** 2.0
- CQL Library Description:** (Empty text area)
- Comments:** This example is a work in progress and should not be considered a final specification or recommendation for guidance. This example will help guide and direct the process of finding conventions and usage patterns that meet the needs of the various stakeholders in the measure development community.

 @update: @@BTR 2020-03-31 -> Incremented version to 2.0.000 Updated FHIR version to 4.0.1

 @@@
- Using Model:** FHIR / CQL
- Model Version:** 4.0.1
- Publisher:** --Select--
- Experimental**

A sidebar on the left lists other tabs: Includes (01), Value Sets (05), Codes (00), Parameter (01), Definition (01), Function (00), and CQL Library Editor.

MAT 6.03 QDM and FHIR Release Notes

Defects Corrected in 6.03 and Enhancements:

- A space is no longer missing prior to the word default when pasting in CQL code into the Parameters page CQL editor.
- Grid Number of Items Selected now accurately states number of grid rows selected upon navigation back to the Measure Library page after editing a measure.
- Measurement Period parameter should always be editable within the parameters page
- QDM model type is always enabled when creating de novo measure immediately after creating a draft measure from a versioned FHIR measure.
- More detailed error messages given on packaging, rather than System Error, to provide users more insight into errors to correct
- FHIR data requirements now include type retrieves. Example: `First([Encounter] E where E.class = 'inpatient' sort by period.start desc` is now captured as a data requirement `{ "type": "Encounter" }`

MAT 6.03 QDM and FHIR Release Notes

508 Compliance Enhancements in 6.03:

- Underscores in exported artifact file and folder names have been replaced with dashes (-)
- Tab and Shift Tab keyboard navigation is available everywhere in the MAT. Skip to Main Content link is visible to aid keyboard navigation.
- Space and Enter keyboard actions are available in appropriate places in the MAT
- Screen Readers correctly read field labels, prompts and watermark text in the MAT
- Required Fields are clearly labeled in the MAT
- Field Level Validation error handling has been enhanced for 508 compliance

The screenshot displays the 'General Measure Information' form. On the left is a sidebar with a 'Delete Measure' button and a list of tabs: 'General Measure Information' (selected), 'Measure Steward / Developer', 'Description', 'Copyright', 'Disclaimer', and 'Measure Type'. The main form area has a title 'General Measure Information' and a 'View Human Readable' button. The 'Measure Name (*)' field is empty and has a red border with an error message: 'A measure name is required.' Below it is the 'Measure Scoring (*)' dropdown menu set to 'Proportion'. To the right, the 'eCQM Abbreviated Title (*)' field contains 'NewFHIRMeasure', and the 'Patient-based Measure (*)' dropdown is set to 'Yes'. The 'Finalized Date' and 'GUID' fields are partially visible at the bottom.

Questions?

Contact Us!

Create a MAT and Bonnie Issue Tracker here:

<https://oncprojecttracking.healthit.gov/support/projects/BONNIEMAT/summary>