

Figure 1 CMS Logo



# Measure Authoring Tool Release Notes

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Version 5.0.0  
October 31, 2016

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## Enhancements

A description of the Measure Authoring Tool (MAT) version 5.0.0 enhancements are listed below. This MAT release includes the implementation of Clinical Quality Language (CQL). It is important to note that the changes discussed in this document were applied only to the MAT staging environment for the purpose of User Acceptance Testing (UAT). The production version of the MAT remains on MATv4.6. The release notes for MATv4.6 can be found here:

<https://www.emeasuretool.cms.gov/documents/10179/13108/Release+Notes++4.6.0/1b131349-3da5-42e0-8646-a898d129acce>

### 1.1 Implementation of GWT Bootstrap

GWT Bootstrap is a web framework implemented over sections of the MAT. It has some influence on how things look but will not affect how the system functions.

### 1.2 Update to QDM 5.0

The Mat has been updated to comply with the QDM version 5.0. For information on the QDM version 5.0 and what is included, please refer to

[https://ecqi.healthit.gov/system/files/qdm\\_5\\_0\\_draft\\_160912\\_errata\\_508\\_compliant\\_0.pdf](https://ecqi.healthit.gov/system/files/qdm_5_0_draft_160912_errata_508_compliant_0.pdf)

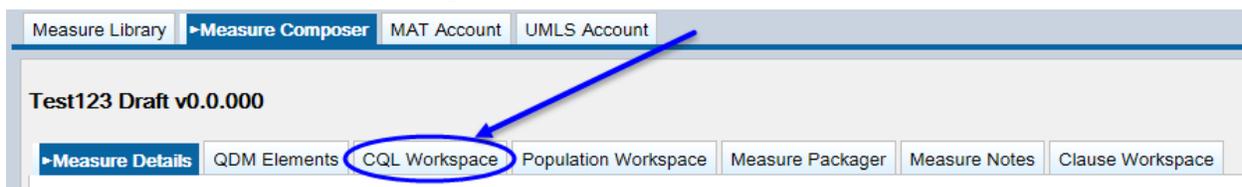
### 1.3 Removed the Occurrence Functionality from the QDM Elements Tab

The ability to occurrence items on the QDM elements tab with the Specific Occurrence checkbox has been removed as this functionality is not supported with CQL.

### 1.4 Creation of a CQL Workspace

The Measure Composer tab of the MAT now shows a tab labeled CQL Workspace following the QDM Elements tab.

Figure 2: Location of CQL Workspace

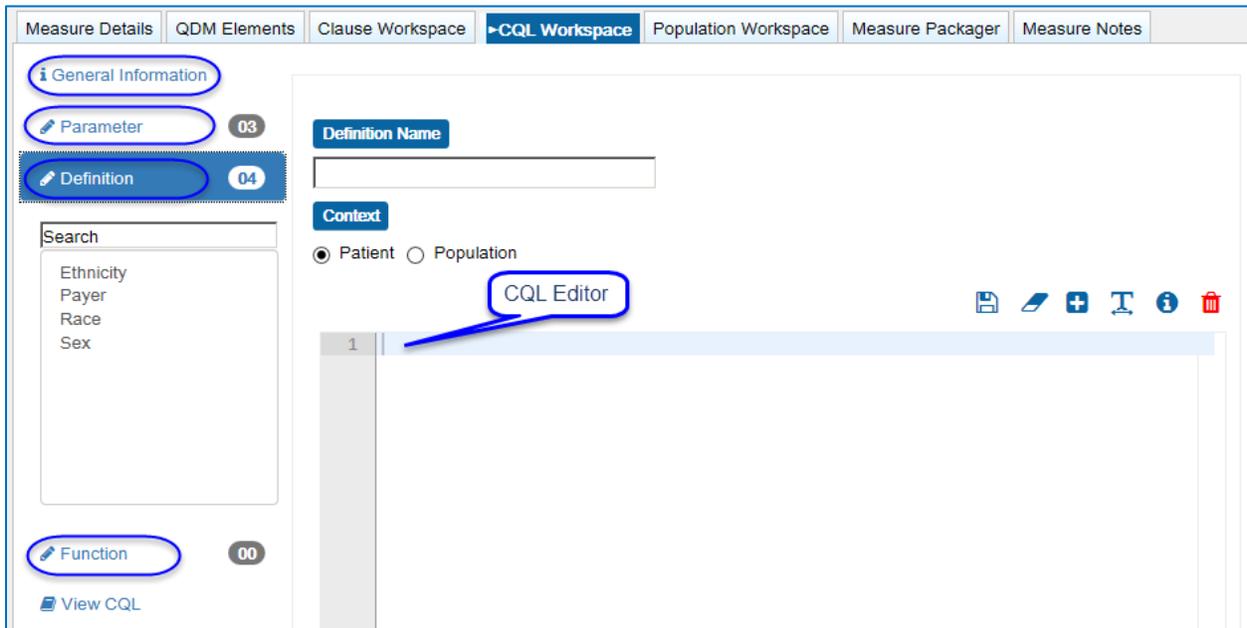


### 1.5 Added Functionalities to CQL Workspace

Added areas in the CQL Workspace to enter the following items:

- General Information for the name and model of the measure
- Parameters for the measure
- Definitions to be utilized in the measure
- A Function space to input the logic of the measure
- A CQL Editor for CQL entries

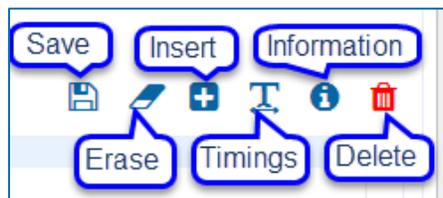
**Figure 3: Placement of the Functionalities in the CQL Workspace**



Also included the following icons above the CQL Editor to assist with entry:

- Save – to keep your work
- Erase – to clear your work so far
- Insert – to insert elements into your logic
- Timing Expression – to insert timings into your logic
- Information – for shortcut keys
- Delete – to delete the element completely

**Figure 4: Icons for Additional Functions in CQL Workspace**



### **1.6 Created Shortcut Keys to Assist with CQL Entry**

The following shortcut keys were created to assist users in writing their CQL logic in the CQL Editor.

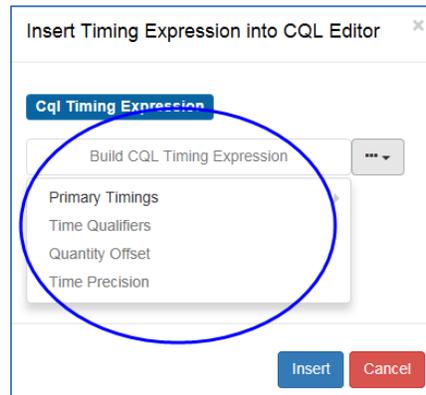
- CTRL-Alt-t: Timings
- CTRL-Alt-f: Functions
- CTRL-Alt-d: Definitions
- CTRL-Alt-p: Parameters
- CTRL-Alt-a: Attributes

- CTRL-Space: All

### 1.7 Created a Timing Builder to Assist with CQL Entry

A timing builder was created to assist in building and inserting timings into the CQL Editor in the correct CQL syntax. This builder is accessed through the Timings Icon and displays in a separate pop-up box.

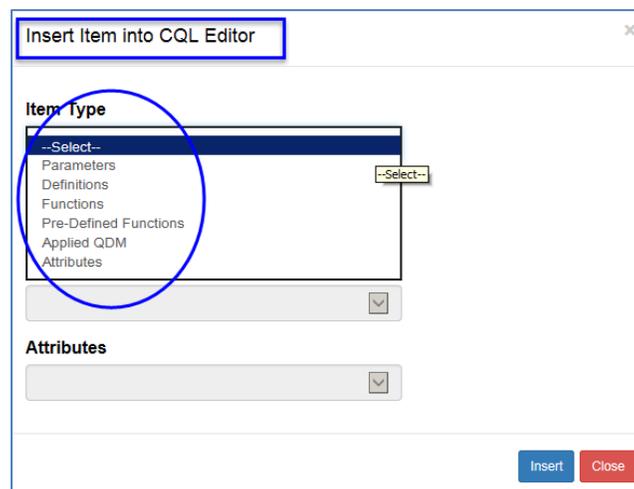
Figure 5: Image of Timing Builder



### 1.8 Created an Insert Tool to Assist with CQL Entry

An insert function was added to the MAT to assist in inserting commonly used items into the CQL Editor in the correct CQL syntax. This tool is accessed through the Insert Icon and displays in a separate pop-up box. From this tool users can insert already defined Parameters, Definitions, Functions, and Applied QDM Elements, as well as, Attributes and several pre-defined functions built into the system.

Figure 6: Image of Insert Tool



### 1.9 Added Library and Model information to the General Information Section

In the General Information section of the CQL Workspace the system will declare the Library Name and version as well as the name and version of the QDM model used in the measure.

### 1.10 Naming structure added for CQL names in the CQL Workspace

All names created across the Parameter, Definition, and Functions sections must be unique within that measure and conform to the following rule:

- Names may not contain any of the following:

“, <, >, /, \, or ‘

The validation of the name is not case sensitive.

### 1.11 Added a Context Section to the CQL Definition and Function Sections

A section has been added to the Definition and Function sections of the CQL Workspace to allow users to indicate whether their Definition or Function is Patient or Population based.

Figure 7: Location of the Context Selection



### 1.12 Added Validations to CQL Workspace

The following validations have been added to the CQL Workspace

- Check for unsaved data prior to moving to another area of the MAT.
- Validate the name structure of Parameters, Definitions, and Functions upon creation.
- Validate Parameters, Definitions, and Functions upon clicking the save icon.
- Ensure that all Populations, Measure Observations, or Stratifications used within a measure grouping contain logic and that logic does not have errors upon packaging.

### 1.13 Added user messages to CQL Workspace

- Generate an error message when a Parameter, Definition, or Function name is entered as a duplicate of one already in the measure or contains a prohibited character.

Figure 8: Message for Invalid Name

**Invalid Definition name. Duplicate name or use of restricted character(s).**

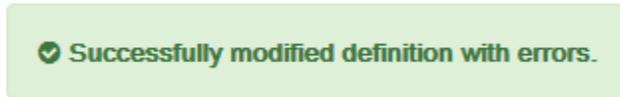
- Generate an error message when a Parameter, Definition, or Function is saved or modified successfully.

Figure 9: Successfully Saved Message



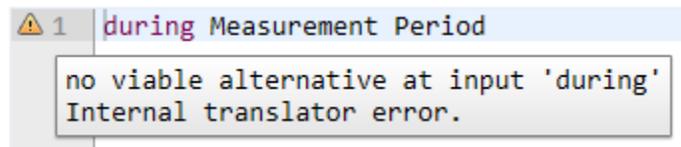
- Generate an error message when a Parameter, Definition, or Function is saved or modified with errors.

Figure 10: Successfully Modified with Errors Message



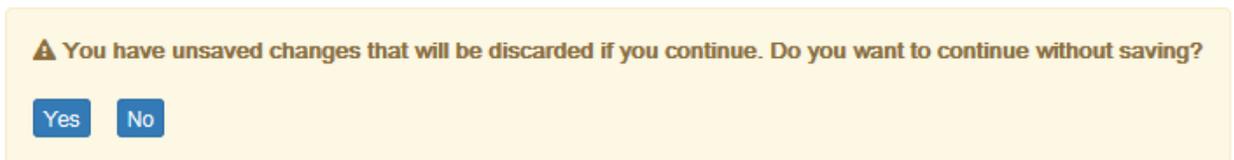
- Generate error messages from the CQL to ELM parser indicating the error in the Parameter, Definition, or Function validated upon saving.

Figure 11: Example of Error Message within the Logic



- Generate an error message when moving to another area of the MAT when you have made changes but have not saved them.

Figure 12: Message Received When Moving to Another Area Without Saving.



### 1.14 Added Validation to the Population Workspace

- Validate that all populations, stratifications, or measure observations included in a measure grouping on the Measure Packager tab, contain logic and that logic is valid.

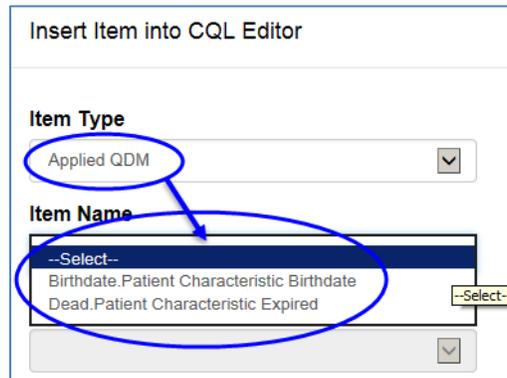
Figure 13: Error Upon Packaging Message



### 1.15 Hard Coded the Patient Characteristics Birthdate and Dead

The Patient Characteristics Birthdate and Dead have been hard coded into the MAT as available Applied QDM Elements to be used within any measure.

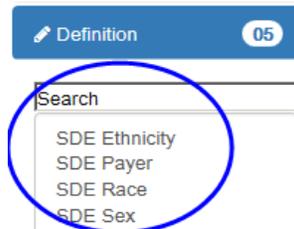
**Figure 14: Image Showing Hard Coded Applied QDM**



### **1.16 Created default definitions for the 4 standard Supplemental Data Elements**

The four standard supplemental data elements, Ethnicity, Payer, Race, and Sex, have been defined for the users and pre-loaded into the Definition section of the CQL Workspace. They are also loaded into the Supplemental Data Elements box on the Measure Packager tab for use in the measures. Users do have the option of removing them if they are not needed for that particular measure.

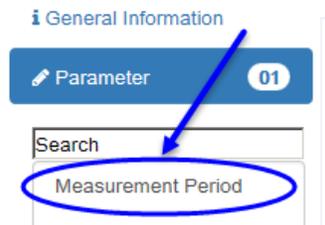
**Figure 15: Image Showing 4 Standard SDEs in Definitions**



### **1.17 Created Default Parameter “Measurement Period”**

The MAT automatically defines the measurement period defined on the Measure Detail Tab as a Parameter for use within CQL definitions.

**Figure 16: Measurement Period Showing in Parameters.**



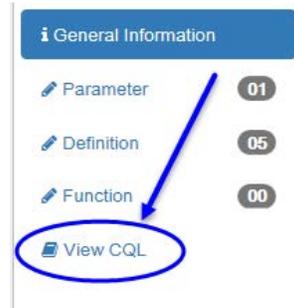
### **1.18 Limited editing for Locked and Read-Only Measures in CQL**

The editing function has been limited for locked or read-only measures in the MAT.

### 1.19 Added the 'View CQL' function to CQL Workspace

Users can use the View CQL section of the CQL Workspace at any point to open a read-only version of their current CQL measure as it would look if the measure were to be packaged for export at that moment; thereby, allowing for a way to check the work as it is in progress.

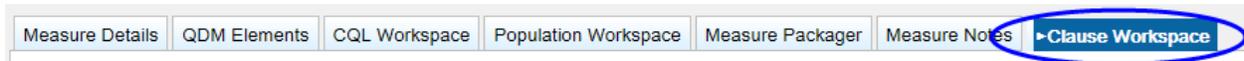
Figure 17: Showing Location of View CQL Section



### 1.20 Clause Workspace Read-only

The Clause Workspace is now read-only and is intended for reference purposes for previously packaged measures. This is no longer a functioning space.

Figure 18: Showing Location of Clause Workspace



### 1.21 Changed Heading Under Risk Adjustment Variables Section

On the Measure Packager tab of the Measure Composer, the heading of the left-hand side box under Risk Adjustment Variables has been changed from Clauses to Definitions to accommodate the new CQL format.

### 1.22 Added Filtering to the Measure Packager

Filtering was added to the measure packager to filter the exports based on the direct or indirect usage of the CQL artifact in the Population Workspace.

### 1.23 Added two new Files to the Export Package

CQL file, is the file containing all of the Clinical Quality Language logic that has been included in the populations, stratifications, and/or measure observations when the measure was packaged.

Expression Logical Model (ELM) file, is the file containing a machine readable XML expression of the CQL.

### ***1.24 Changes Made to Human Readable Export***

The Human Readable export will now show definitions, logic, and populations with CQL expressions rather than clauses.

### ***1.25 Changes Made to HQMF Export***

The HQMF Export will now be based on CQL expressions created in the new CQL workspace.

### ***1.26 Simple XML no longer available***

The Simple XML export is no longer available when packaging a measure for regular MAT users. The two new exports provide all necessary information in a standardized format.