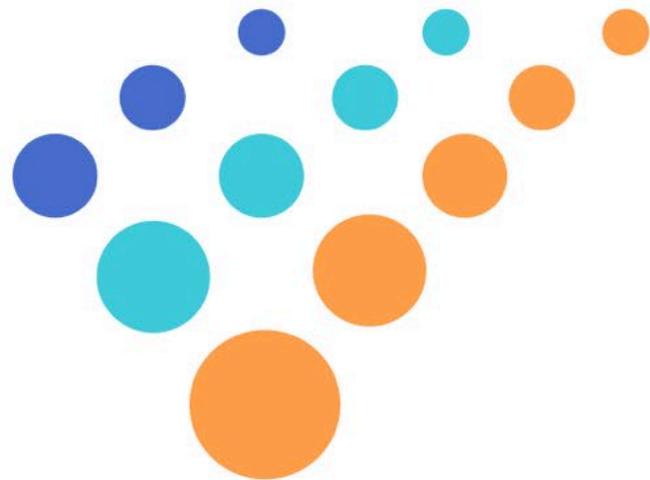




AGENCY FOR HEALTHCARE RESEARCH AND QUALITY



June 2020 CDS Connect Work Group Call



CDS Connect

Agenda

Schedule	Topic
3:00 – 3:02	<ul style="list-style-type: none">• Roll Call, Michelle Lenox (MITRE)
3:02 – 3:05	<ul style="list-style-type: none">• Review of the Agenda, Maria Michaels (CDC)
3:05 – 3:15	<ul style="list-style-type: none">• Lessons Learned with CDS Connect: Use of Authoring Tool for Hypertension, Christopher d’Autremont (OSHU)
3:15 – 3:50	<ul style="list-style-type: none">• CPG on FHIR updates to Repository and CDS Authoring Tool (MITRE)
3:50– 3:55	<ul style="list-style-type: none">• What's New with CDS Connect This Month (MITRE)
3:55 – 4:00	<ul style="list-style-type: none">• Open Discussion, Announcements, and Close Out, Maria Michaels (CDC)

Objectives

- Hear lessons learned from a member developing CDS Artifacts using the CDS Authoring Tool
- View demonstrations on implementation of CPG-on-FHIR with CDS Connect's Repository and CDS Authoring Tool
- Share new features and resources available for CDS Connect

Developing CDS Artifacts for Hypertension

Oregon Health & Science University
Care Management Plus Team

Presenters:

Christopher d'Autremont, MBI
Senior Research Assistant

Matthew Storer
Developer

Hypertension CDS Development



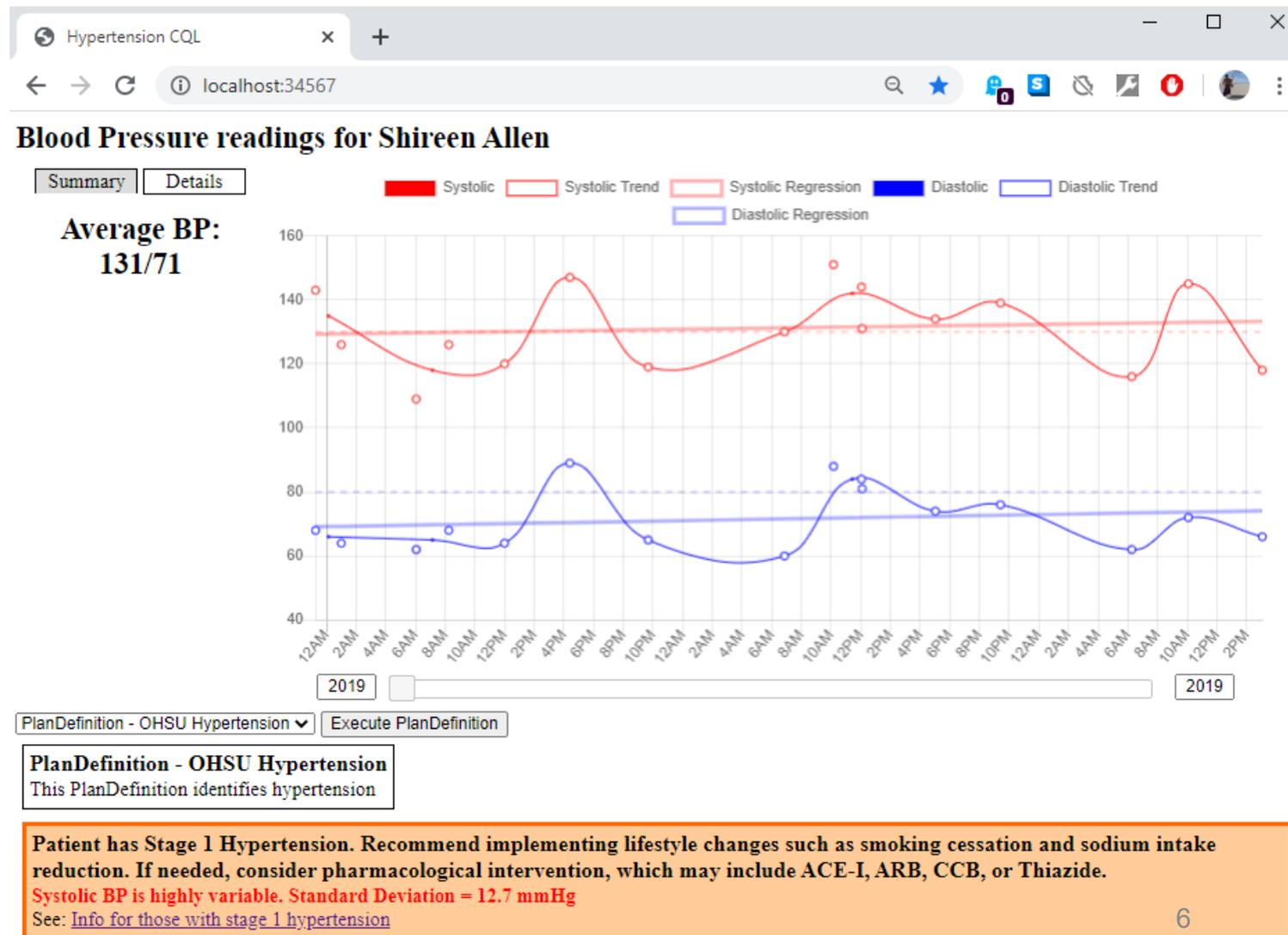
About our project

- Developed by the Care Management Plus Team under Dr. David Dorr at OHSU
- Hypertension is a common condition that predicts heart attack and stroke
- Treatment requires a combination of lifestyle changes and pharmaceutical interventions
- Our goal is to develop and test a patient-facing, EHR-agnostic CDS tool for Hypertension treatment using FHIR resources

Hypertension CDS Development – cont.

Prototype Hypertension FHIR App

- Displays over-time BP chart detailing raw data points, regression, and trend via custom curve for systolic and diastolic blood pressure observations;
- Includes a tabbed pane displaying textual summary and detailed data;
- Integrates with CQF-Ruler for CQL execution of recommendation logic via PlanDefinition artifacts



Hypertension CDS Development – cont.2

Condition: No comorbidity requiring specific initial pharmacotherapy

There does **not exist** a condition with a code from **Diabetes** , **Myocardial Infarction** , **Chronic Kidney Disease All Stages (1 through 5)** , or ...

Comment:

Value Set 1: Diabetes (2.16.840.1.113883.3.464.1003.103.12.1001)

Value Set 2: Myocardial Infarction (2.16.840.1.113883.3.526.3.403)

Value Set 3: Chronic Kidney Disease All Stages (1 through 5) (2.16.840.1.113762.1.4.1222.159)

Value Set 4: Coronary Artery Disease No MI (2.16.840.1.113883.3.526.3.369)

Value Set 5: Heart Failure (2.16.840.1.113883.3.526.3.376)

Expressions: Exists Not

Return Type: Boolean



```
define "No comorbidity requiring specific initial pharmacotherapy":
  not(exists("generic_condition_valuesets"))

define "Comorbid Diabetes":
  exists([Condition: "Diabetes VS"])

define "Comorbid Chronic Kidney Disease All Stages (1 through 5)":
  exists([Condition: "Chronic Kidney Disease All Stages (1 through 5) VS"])

define "Coronary Artery Disease No MI":
  exists([Condition: "Coronary Artery Disease No MI VS"])

define "No prior Myocardial Infarction":
  not(exists([Condition: "Myocardial Infarction VS"]))

define "History of Myocardial Infarction":
  exists([Condition: "Myocardial Infarction VS"])

define "Recent Myocardial Infarction":
  exists(C3F.ConditionLookBack([Condition: "Myocardial Infarction VS"], 2 years))

define "Comorbid HF":
  exists([Condition: "Heart Failure VS"])

define "Recommendation":
  if "Adults over 55 with no comorbidity requiring specific initial pharmacotherapy" then 'As
the patient does not have a comorbidity requiring specific initial pharmacotherapy, consider
using a Thiazide-type diuretic, an ACE-Inhibitor, an ARB, or a CCB as therapeutic options.
Do not use a Beta-blocker as a therapeutic option.'
```

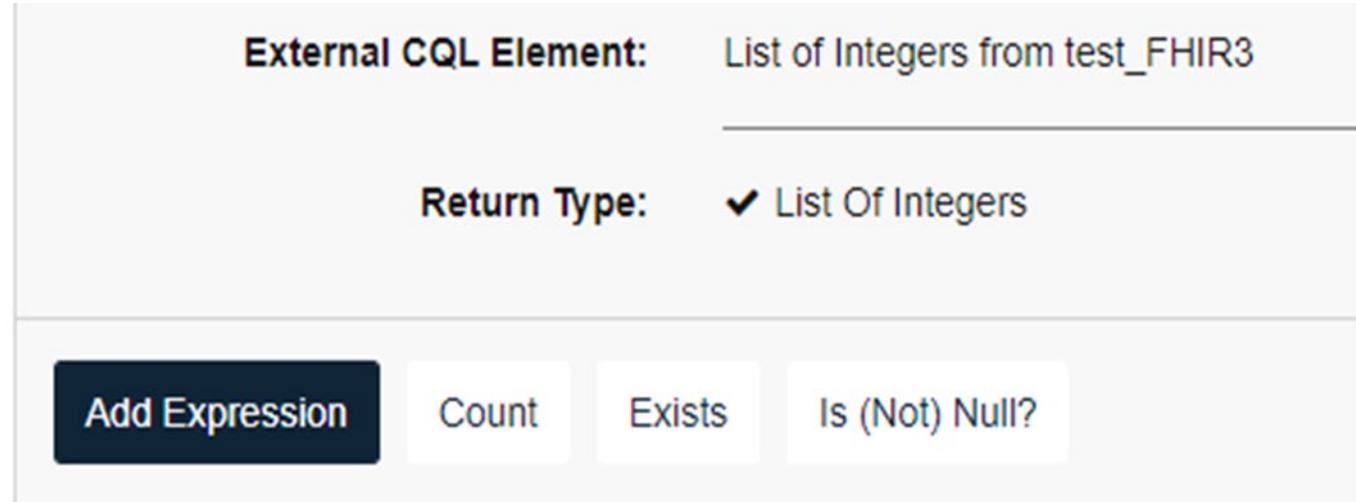
Hypertension CDS Development - cont.3

The CDS Authoring Tool provides expressions that can be applied to different element types.

However, many expressions applicable to certain element types are not available through the CDS Authoring Tool.

This requires pushing any logic that employs unsupported expressions to External CQL Libraries, limiting the Tool's usefulness.

More commonly-used expressions should be added to the Tool.



The screenshot shows a configuration panel for an External CQL Element. The 'External CQL Element' field is set to 'List of Integers from test_FHIR3'. The 'Return Type' is set to 'List Of Integers' with a checkmark. Below these fields is a row of buttons: 'Add Expression' (highlighted in dark blue), 'Count', 'Exists', and 'Is (Not) Null?'.



First(), Last(), Take(), Contains(), Avg(),
Min(), Max(), Median(), Mode(), StdDev()

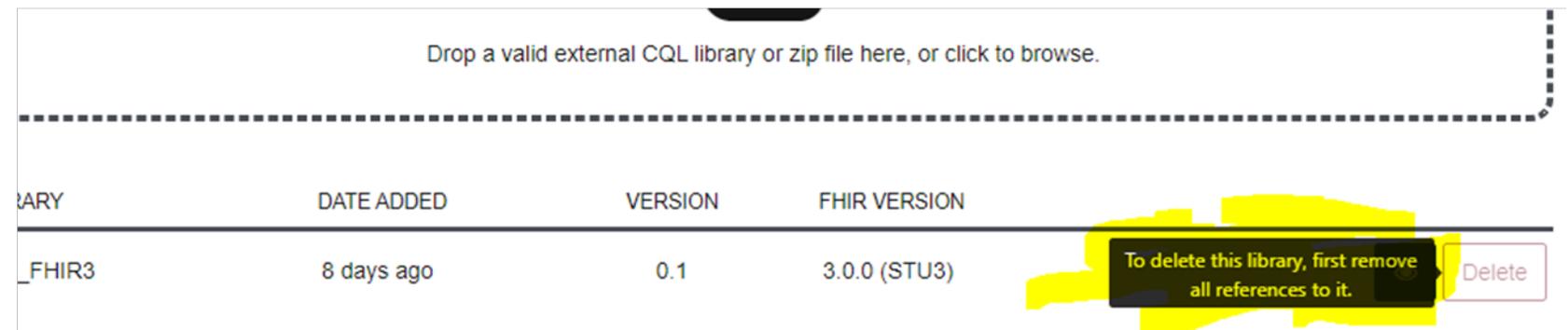
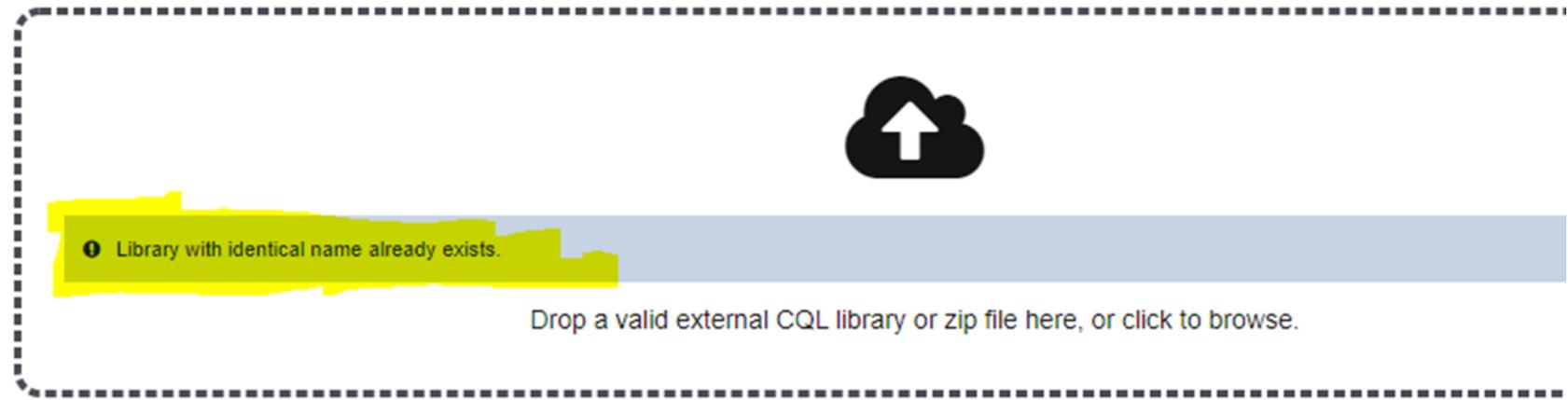
Hypertension CDS Development – cont.4

An External CQL Library cannot be uploaded if a Library with that name already exists.

Also, an External CQL Library cannot be deleted if it is referenced by any components in the CDS Authoring Tool.

As such, fixing bugs or adding logic to External CQL Libraries requires repetitive and burdensome recreation of Authoring Tool artifacts.

Updating Libraries should be easier.



A screenshot of a table listing external CQL libraries. The table has four columns: LIBRARY, DATE ADDED, VERSION, and FHIR VERSION. Below the table is a "Delete" button. A yellow error message is overlaid on the table, stating: "To delete this library, first remove all references to it." The interface is enclosed in a dashed border.

LIBRARY	DATE ADDED	VERSION	FHIR VERSION
FHIR3	8 days ago	0.1	3.0.0 (STU3)

Hypertension CDS Development – cont.5



Questions?

CPG-ON-FHIR UPDATES: CDS CONNECT REPOSITORY

MITRE, CDS Connect Team

CPG-ON-FHIR UPDATES: CDS AUTHORIZING TOOL

MITRE, CDS Connect Team

CPG-on-FHIR Updates: Repository and Authoring Tool



Questions?

WHAT'S NEW WITH CDS CONNECT

MITRE, CDS Connect Project Team

Updates and New Features



- Authoring Tool
 - ▶ Support for providing user comments on groups
 - ▶ Support for using and exporting URL-based value set identifiers (CPG-on-FHIR recommendation)
 - ▶ Usability enhancements and bug fixes
 - ▶ Continued work on CPG-on-FHIR metadata support (not yet released)
- Prototype Tools
 - ▶ [CQL Testing Framework](#)
 - Version 2.1.1: Support for downloading and using version-specific value sets from VSAC
 - ▶ [CQL Services](#)
 - Version 1.6.1: Support for downloading and using version-specific value sets from VSAC
 - ▶ [Pain Management Summary](#)
 - Version 0.3.3: Support for downloading and using version-specific value sets from VSAC; support for URL-based value set identifiers; bug fix for incorrect Windows file paths
- Repository
 - ▶ CPG-on-FHIR implementation for repository under development (not yet released)
 - ▶ Improvements to login/logout and profile pages currently under development
 - ▶ Updated to Drupal 8.8 (no user interface changes)

Link to CDS Connect: <https://cds.ahrq.gov/cdsconnect>

ANNOUNCEMENTS, OPEN DISCUSSION AND CLOSE-OUT

Maria Michaels

Office of Public Health Scientific Services
Centers for Disease Control and Prevention