August 2020 CDS Connect Work Group Call
## Agenda

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 - 3:02</td>
<td>Roll Call, Michelle Lenox (MITRE)</td>
</tr>
<tr>
<td>3:02 - 3:05</td>
<td>Review of the Agenda, Maria Michaels (CDC)</td>
</tr>
<tr>
<td>3:05 - 3:50</td>
<td>Alcohol Screening and Brief Intervention (ASBI) Clinical Decision Support (MITRE)</td>
</tr>
<tr>
<td>3:50 - 3:55</td>
<td>What's New with CDS Connect This Month (MITRE)</td>
</tr>
<tr>
<td>3:55 - 4:00</td>
<td>Open Discussion and Close Out, Maria Michaels (CDC)</td>
</tr>
<tr>
<td></td>
<td>Open discussion and announcements</td>
</tr>
<tr>
<td></td>
<td>Concluding comments, review next steps and adjourn</td>
</tr>
</tbody>
</table>
Work Group Objectives

• Share new features and resources available for CDS Connect
• Share lessons learned on the use of CDS Connect
• Discuss topics of interest to members relating to opportunities for CDS Connect
Alcohol and Substance Use Screening and Brief Intervention (ASBI) Clinical Decision Support (CDS)

NOTICE
This (software/technical data) was produced for the U. S. Government under Contract Number 75FCMC18D0047, and is subject to Federal Acquisition Regulation Clause 52.227-14, Rights in Data-General.

No other use other than that granted to the U. S. Government, or to those acting on behalf of the U. S. Government under that Clause is authorized without the express written permission of The MITRE Corporation.

For further information, please contact The MITRE Corporation, Contracts Management Office, 7515 Colshire Drive, McLean, VA 22102-7539, (703) 983-6000.

© 2020 The MITRE Corporation.
## ASBI CDS Agenda

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to ASBI</td>
<td>Mary Kate Weber (CDC)</td>
</tr>
<tr>
<td>ASBI Screening CDS Tools</td>
<td>Sharon Sebastian</td>
</tr>
<tr>
<td>ASBI Brief Intervention CDS Tools</td>
<td>Ginny Meadows</td>
</tr>
<tr>
<td>ASBI CDS Technical Approach</td>
<td>David Winters</td>
</tr>
<tr>
<td>Pilot Discussion</td>
<td>Ginny Meadows</td>
</tr>
<tr>
<td>Questions/Wrap-up</td>
<td>All</td>
</tr>
</tbody>
</table>
Welcome and Introduction
ASBI Screening CDS Tools
Advancing Evidence into Practice Faster and More Efficiently

The CDC ASBI CDS project leveraged two powerful initiatives enabling consistent interpretation and facilitating rapid dissemination of publicly-available, evidence-based clinical practice guidelines.

1. **Adapting Clinical Guidelines for the Digital Age** (CDC)
2. **CDS Connect** (AHRQ)
Rationale and Evidence Base for the Screening CDS Tools

The ASBI team sought to:

- Provide an array of validated screening resources
- Offer modularized tools that can be integrated with existing capabilities
  - Organizations that seek brief intervention (BI) support are encouraged to implement one or both companion BI CDS tools
- CDS design was informed by environmental scan findings and collaboration with SMEs
## Alcohol Screening Instrument Selection

Selecting an alcohol screening instrument is an important decision. There are subtle nuances that set them apart from each other. Each of the alcohol screening CDS tools centers on one of these evidence-based screening tools

<table>
<thead>
<tr>
<th>WHO AUDIT Screening Tool</th>
<th>USAUDIT Screening Tool</th>
<th>NIDA Quick Screen Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumes a standard drink size of 10 grams</td>
<td>Adjusts for the standard U.S. drink size of 14 grams and U.S. low-risk drinking guidelines recommended by the United States Dietary Guidelines and the National Institute on Alcohol Abuse and Alcoholism (NIAAA).¹</td>
<td>A validated, brief 4-question screening tool for multiple substances</td>
</tr>
<tr>
<td>Recommends adapting questions #2 and #3 based on the standard drink size in the country where the instrument will be used.¹</td>
<td>Adjusts questions #1 - #3 by expanding the number of responses and modifying the wording of question #3.</td>
<td>*The NIDA QS to USAUDIT Alcohol Screening CDS tool flows from presenting the patient with the four NIDA QS questions (one of which evaluates the frequency of “heavy drinking” days in the past year) to the full USAUDIT if the patient screens positive for heavy drinking.</td>
</tr>
</tbody>
</table>

¹ (Babor & Higgins-Biddle, 2001), ² (Higgins-Biddle & Babor, 2018), ©2020 THE MITRE CORPORATION. ALL RIGHTS RESERVED. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED. PUBLIC RELEASE CASE NUMBER 20-2117.
Alcohol Screening CDS Flow (1 of 3)

Each of the three alcohol screening tools incorporate:

1. Logic to prompt screening, if it is indicated.
2. An alcohol prescreen question (i.e., Do you sometimes drink beer, wine, or other alcoholic beverages?) to shorten the length of screening time if the patient does not drink alcohol.

- In the USAUDIT Alcohol Screening tool, the prescreen question would appear at the following point in the CDS flow:
3. Logic to deliver the proper sequence of patient-specific screening questions as outlined in published evidence-based guides.

Question #3 in the USAUDIT:
How often do you have X (5 for men; 4 for women and men over 65) or more drinks on one occasion?

The ASBI USAUDIT Alcohol Screening tool provides women and men over 65 years old with a version of Question #3 that includes a “4 drink” threshold. All other individuals will be presented with a version of Question #3 that includes a “5 drink” threshold.
Alcohol Screening CDS Flow (3 of 3)

4. Logic to score each component of the screening tool (e.g., the USAUDIT-C and the USAUDIT in the USAUDIT Alcohol Screening tool)

5. Logic to determine whether a “pregnancy question” should be presented to the patient (i.e., Are you currently pregnant or trying to become pregnant?)

   The answer to this question is stored so it can be retrieved by the two brief intervention CDS tools, to ensure the most appropriate intervention is displayed for that specific patient.
ASBI Brief Intervention CDS Tools
The project team created and published two CDS tools to identify those patients screened for alcohol use using either the U.S. or WHO version of the AUDIT screening questionnaire who may benefit from a brief intervention.

**Brief Intervention and Referral**
- Provides guidance to clinicians on appropriate brief interventions
- Facilitates the referral of appropriate patients to evaluation and possible treatment of alcohol use disorder

**Patient Decision Aid**
- Provides information targeted to patients to help inform and educate them regarding their drinking
- Offers information and access to tools to help the patient consider reducing their alcohol consumption
### Alcohol Brief Intervention and Referral CDS

The *Alcohol Brief Intervention and Referral* CDS provides brief intervention care recommendations based on the patient’s AUDIT score and “Zone”, reported level of drinking, and additional patient-specific information.

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Description</th>
<th>Intervention</th>
<th>USAUDIT Score</th>
<th>WHO AUDIT Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone I</td>
<td>Low-risk drinking or abstinence</td>
<td>Feedback; Education (Reinforce low-risk drinking levels)</td>
<td>0 – 6/7 (Women/Men)</td>
<td>0 – 6/7 (Women/Men)</td>
</tr>
<tr>
<td>Zone II</td>
<td>Alcohol use in excess of low-risk guidelines</td>
<td>Feedback; Brief Intervention; Education</td>
<td>7/8 – 15 (Women/Men)</td>
<td>7/8 – 15 (Women/Men)</td>
</tr>
<tr>
<td>Zone III</td>
<td>Harmful and hazardous drinking</td>
<td>Monitoring; Brief Intervention and Follow-up (Consider further evaluation and treatment if warranted)</td>
<td>16 – 24</td>
<td>16 – 19</td>
</tr>
<tr>
<td>Zone IV</td>
<td>Suggests alcohol dependence</td>
<td>Referral to specialist for evaluation and treatment</td>
<td>25+</td>
<td>20 – 40</td>
</tr>
</tbody>
</table>

Intervention Information Displayed to the Clinician

- Information specific to the patient’s AUDIT screening results
- Brief intervention suggestions based on the patient’s pregnancy status, drinking levels and other information
- Patient education resources (links or suggestions of “hard copy” materials to give to the patient)
- If indicated, suggesting and facilitating a referral for the patient to receive diagnostic evaluation and possible treatment of alcohol use disorder
- **NOTE:** Implementers may decide to customize this information based on their own resources and current process, if desired
Brief Intervention and Referral CDS Flow: Pregnant Patients

The CDS logic incorporates:

1. Logic to determine evidence of either AUDIT screening results or an alcohol prescreen question response within the past 12 months, with no evidence of an associated brief intervention
2. Evidence that the patient is pregnant or trying to become pregnant
3. Evaluation of NIDA Quick Screen responses, if present
Brief Intervention and Referral CDS Flow: All Other Patients

The CDS includes logic to determine:

1. Evidence of AUDIT screening results, with no evidence of an associated brief intervention
2. The most recent AUDIT score
3. Evidence of NIDA Quick Screen responses

Brief intervention content is based on the AUDIT score and the associated Zone. Each of the four Zones is represented in the detailed logic.
Patient Decision Aid CDS Tool

- The *Patient Decision Aid* CDS provides patient-specific information to patients on their level of drinking and how it compares to alcohol consumption above recommended guidelines, along with information and resources to help the patient consider reducing their alcohol consumption.

- The CDS applies to patients screened for alcohol use using either the U.S. or WHO AUDIT.

- The *Patient Decision Aid* CDS could be used in several ways:
  - By the clinician during a brief intervention with a patient, to share the patient-specific drinking information and patient education resources.
  - By the patient through capabilities such as a patient portal or mobile app, to help inform the patient and/or reinforce any brief intervention.
Patient Decision Aid CDS Flow

The CDS logic includes:

1. Logic to determine evidence of AUDIT screening results within the past 12 months, that the patient is not pregnant, and that the calculated ZONE based on the AUDIT screening score is greater than ZONE I.

2. Determining which version of the Patient Decision Aid CDS content to display, based on evidence of patient responses to AUDIT questions #1 through #3.
ASBI CDS Technical Approach
ASBI CDS: Technical Approach

- Preceding slides have provided an overview of the ASBI CDS
  - Textual description and logic flow charts
- ASBI CDS have been defined using a more structured representation
  - Precise & specific
  - Intent is to support interoperability
- This has been accomplished via several open healthcare standards
  - Fast Healthcare Interoperability Resources (FHIR®)
  - Clinical Quality Language (CQL)
  - Substitutable Medical Applications, Reusable Technologies (SMART)
- The following slides describe the technical definition of the screening CDS
  - Definition approach for the intervention CDS is similar
Alcohol Screening CDS Definition: Overall Structure

The alcohol screening CDS is defined by three main components:

- **Fast Healthcare Interoperability Resources (FHIR®) PlanDefinition:** "The container"
  - **FHIR® Questionnaire:** "The questions and available responses"
  - **Clinical Quality Language (CQL) Library:** "The logic"
Alcohol Screening CDS Definition: PlanDefinition

- The CDS is defined using a FHIR® PlanDefinition resource
  - https://www.hl7.org/fhir/plandefinition.html
- FHIR® PlanDefinition resources:
  - Pre-defined groups of actions to be taken under certain circumstances
  - A trigger can be used to specify when each action should occur
  - Also contains all the metadata associated with the CDS
- In the case of the Alcohol Screening CDS:
  - “Under these conditions have the patient respond to these questions”
  - “Use this CQL logic library to determine what to do next”
Alcohol Screening CDS Definition: Questionnaire

USAUDIT (364 lines)  USAUDIT Definition in FHIR® Shorthand (FSH): Question #1

- Alcohol screening instrument represented by a FHIR® Questionnaire
  https://www.hl7.org/fhir/questionnaire.html

- FHIR® Questionnaire contains:
  - Instructional text and images
  - Questions and available responses with scores
  - References to external logical expressions (see next slide)
Alcohol Screening CDS Definition: CQL Library

**FHIR® Questionnaire can reference logic expressions in CQL Library**
- See example above

**CQL expressions can be used for a variety of purposes**
- Calculate AUDIT score (see example above)
- Generate patient-specific question text
- Query patient electronic health record (e.g., to determine age)
Potential CDS Integration Approach

**Health information technology (HIT) system**

- Presupposes certain HIT capabilities
  - FHIR®
  - SMART on FHIR®
- Not all HIT systems currently have these capabilities
- Fortunately final ONC rule will help change this

**SMART on FHIR® app (alcohol screening)**

- Question display & response capture
- CQL execution engine
- PlanDefinition
  - Questionnaire
  - CQL Library
- CDS Definition
- Trigger(s)
- Link to SMART on FHIR app
- Electronic health records (EHR)

- Proprietary server
- FHIR® server
- Database
- Human interface
- Clinician and/or Patient

©2020 THE MITRE CORPORATION. ALL RIGHTS RESERVED. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED. PUBLIC RELEASE CASE NUMBER 20-2117.
ASBI CDS Validation Testing

- **Purpose of validation testing:**
  - To help ensure the CDS performs as intended when integrated into a Health IT system

- **Validation accomplished via multiple types of testing:**
  - Format validation
  - Logic testing
  - End-to-end testing (coarse implementation)

- **Slides in backup describe each type of testing in more detail**
  - And show how they are being applied to the ASBI CDS

- **The following slide describes an online demo of the ASBI CDS using the end-to-end testing software**
End-to-end Testing Resources

- **Online demonstration available:**
  - End-to-end testing of alcohol screening CDS
    - NIDA Quick Screen → USAUDIT
  - Alcohol screening app connects to a public SMART sandbox
    - Sandbox hosts synthetic data
  - Alcohol screening instruments display to screen and capture user responses

- **End-to-end testing software available on GitHub under open source license**
  - asbi-screening-app
  - questionnaire-to-survey
  - asbi-testing-survey
  - asbi-intervention-app
The CDS Artifacts Are Publicly Available on CDS Connect and GitHub!

Alcohol Screening Using the USAUDIT (Alcohol Use Disorders Identification Test, Adapted for Use in the United States)

This CDS artifact facilitates evidence-based alcohol screening with the USAUDIT to identify adults drinking in excess of recommended levels. The logic enables progression from an alcohol prescreen question (i.e., Do you sometimes drink beer, wine or other alcoholic beverages?) to the USAUDIT-C and onto the full USAUDIT, when indicated.

Artifact Type
Risk Assessment
Creation Date
Thu, 06/04/2020 - 12:00
Version
1.0
Status
Draft
Experimental
True

ARTIFACT CREATION AND USAGE
Steward
Centers for Disease Control and Prevention
Contributors

This artifact was developed by MITRE software engineers and clinical informaticists in collaboration with clinical subject matter experts and leaders from the Centers for Disease Control and Prevention (CDC) National Center on Birth Defects and Developmental Disabilities (NCBDDD).

cds.ahrq.gov/cdsconnect/artifact_discovery
https://github.com/asbi-cds-tools

©2020 THE MITRE CORPORATION. ALL RIGHTS RESERVED. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED. PUBLIC RELEASE CASE NUMBER 20-2117.
Pilot Discussion
Pilot Goals and Objectives

- Evaluate the performance of the ASBI CDS in a clinical setting by piloting one CDS screening tool and up to two CDS brief intervention tools

- Secondary goals:
  - Drive improved public health outcomes by enabling consistent interpretation and implementation of evidence-based guidelines for ASBI
  - Continue to contribute to efforts to improve speed, efficiency, accuracy, consistency, and effectiveness of dissemination and implementation of clinical practice guidelines

- Pilot objectives:
  - To ensure that the CDS can be integrated with health information technology (health IT) and EHRs, and performs as expected
  - To collect a limited set of clinical data for quantitative and qualitative analysis of the CDS
Desired Pilot Organization and Clinical Site Characteristics

- **Pilot Organization**
  - Organizational commitment and operational resources to meet pilot needs before, during and after implementation (e.g., executive leadership support, designated technical, clinical and operational resources, clinical champion)

- **Clinical Site**
  - Ambulatory practice, with one or more of these medical specialties
    - Internal Medicine, Family Medicine, Obstetrics-Gynecology
  - Patient population includes women of reproductive age and women currently pregnant
  - Demonstrated need and desire for the pilot CDS

- **Technical support** for standards (e.g., FHIR, CDS Hooks) and capabilities (e.g., structured data availability, technical staff, integration effort, testing resources)

Additional details will be discussed with each interested pilot organization during the pilot engagement process.
Estimated Pilot Timeline

- Identify and Engage Potential Pilot Sites (~3 months)
- Contracting and Pilot Planning (~3 months)
- Pilot Kick-Off and Integration with Pilot Site (4 months)
- Live Pilot (5-6 months)
- Wrap-Up (2 months)
Thank You!
Questions and Comments?
References


WHAT’S NEW WITH CDS CONNECT

David Winters and Chris Moesel, MITRE
Updates and New Features

• Authoring Tool
  ► External CQL Library support enhancements (in progress)
  ► Support for FHIR Devices and Immunization resource types
  ► CPG on FHIR input support
  ► Updated header and footer (in progress)
  ► Various bug fixes and improvements

• Repository
  ► CDS Connect video preparations
  ► New user sign-up form, landing page, and toolbar (coming soon)
  ► CPG on FHIR work continues
  ► Security patches and bug fixes

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