AGENCY FOR HEALTHCARE RESEARCH AND QUALITY

AHRQ

August 2020 CDS Connect Work Group Call

CDS Connect

Agenda

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

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)

MITRE | SOLVING PROBLEMS FOR A SAFER WORLD™

ASBI CDS Agenda

Topic	Presenter
Introduction to ASBI	Mary Kate Weber (CDC)
ASBI Screening CDS Tools	Sharon Sebastian
ASBI Brief Intervention CDS Tools	Ginny Meadows
ASBI CDS Technical Approach	David Winters
Pilot Discussion	Ginny Meadows
Questions/Wrap-up	All

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)

MITRE

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

WHO AUDIT Screening Tool

- Assumes a standard drink size of 10 grams
- Recommends adapting questions #2 and #3 based on the standard drink size in the country where the instrument will be used.[1]

*The ASBI project team adapted question #2 text in the WHO AUDIT CDS to account for the U.S. standard drink size of 14 grams

USAUDIT Screening Tool

- 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).[2]
- Adjusts questions #1 - #3 by expanding the number of responses and modifying the wording of question #3.

NIDA Quick Screen Tool

- A validated, brief 4-question screening tool for **multiple** substances

*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.

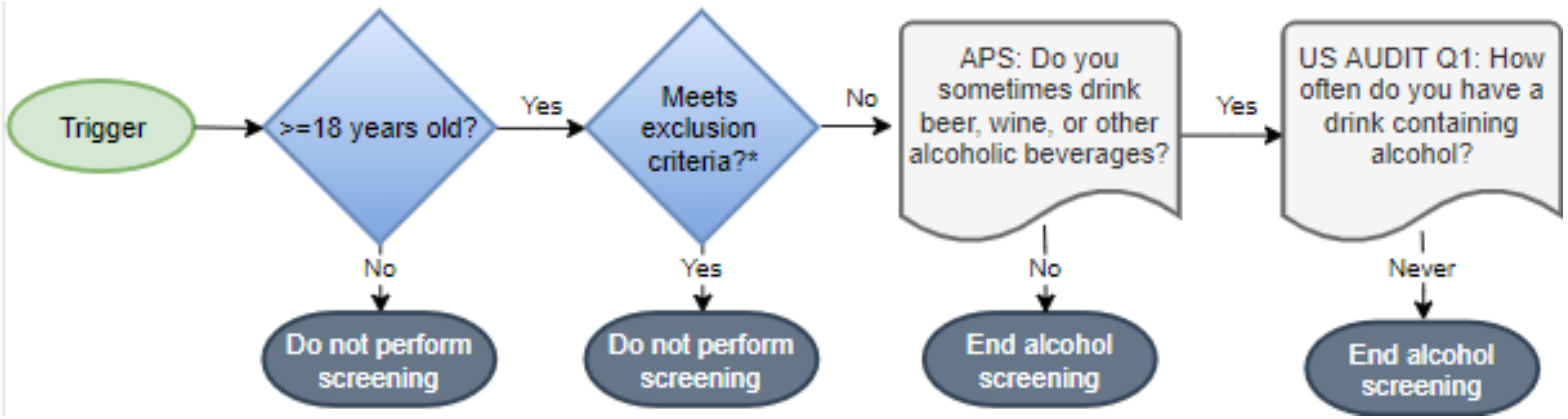
[1] (Babor & Higgins-Biddle, 2001), [2] (Higgins-Biddle & Babor, 2018)

MITRE

Alcohol Screening CDS Flow (1 of 3)

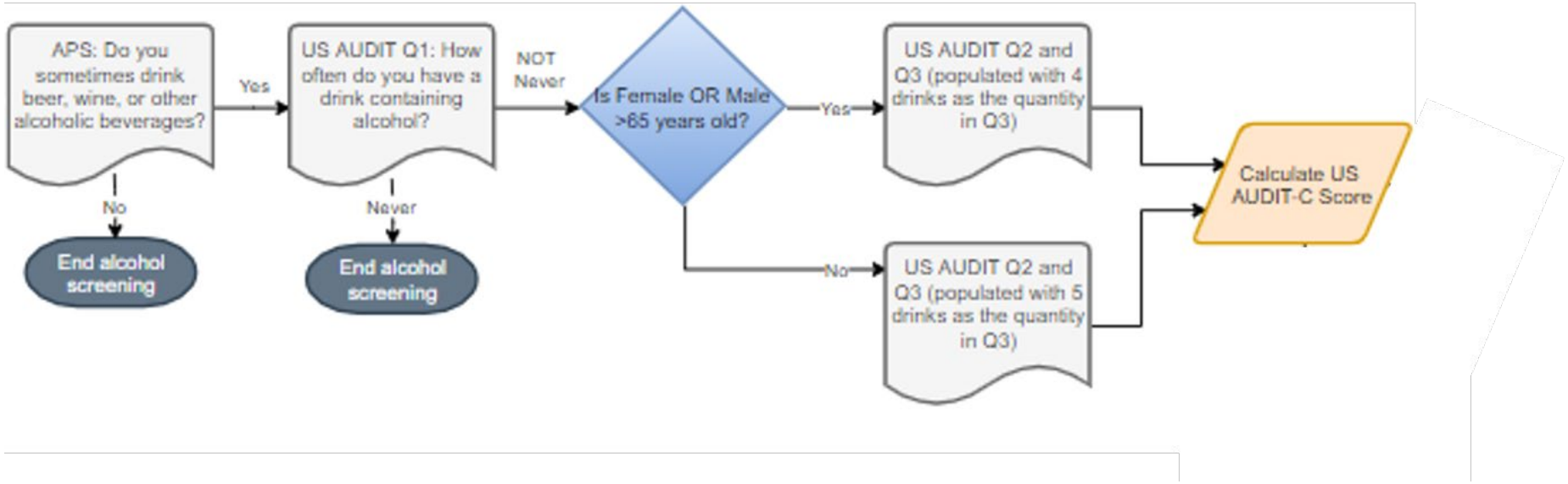
Each of the three alcohol screening tools incorporate:

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:



Alcohol Screening CDS Flow (2 of 3)

3. Logic to deliver the proper sequence of patient-specific screening questions as outlined in published evidence-based guides.

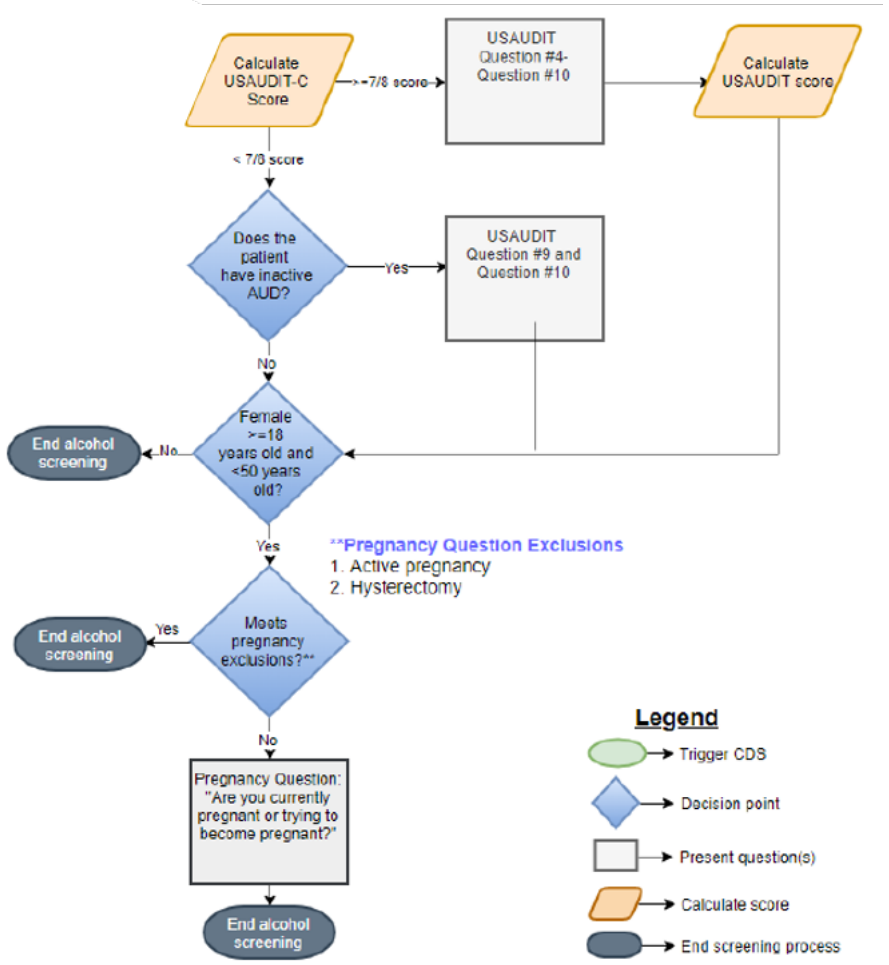


Question #3 in the USAUDIT:
How often do you have X (5 for men; 4 for women and men over 65) or more drinks on one occasion?

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

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

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

Adapted from "The Alcohol Use Disorders Identification Test, Adapted for Use in the United States: A Guide for Primary Care Practitioners" by Babor, et al., 2017, p. 12, and "Brief Intervention for Hazardous and Harmful Drinking: A Manual for Use in Primary Care" by Babor & Higgins-Biddle, 2001, p.12.

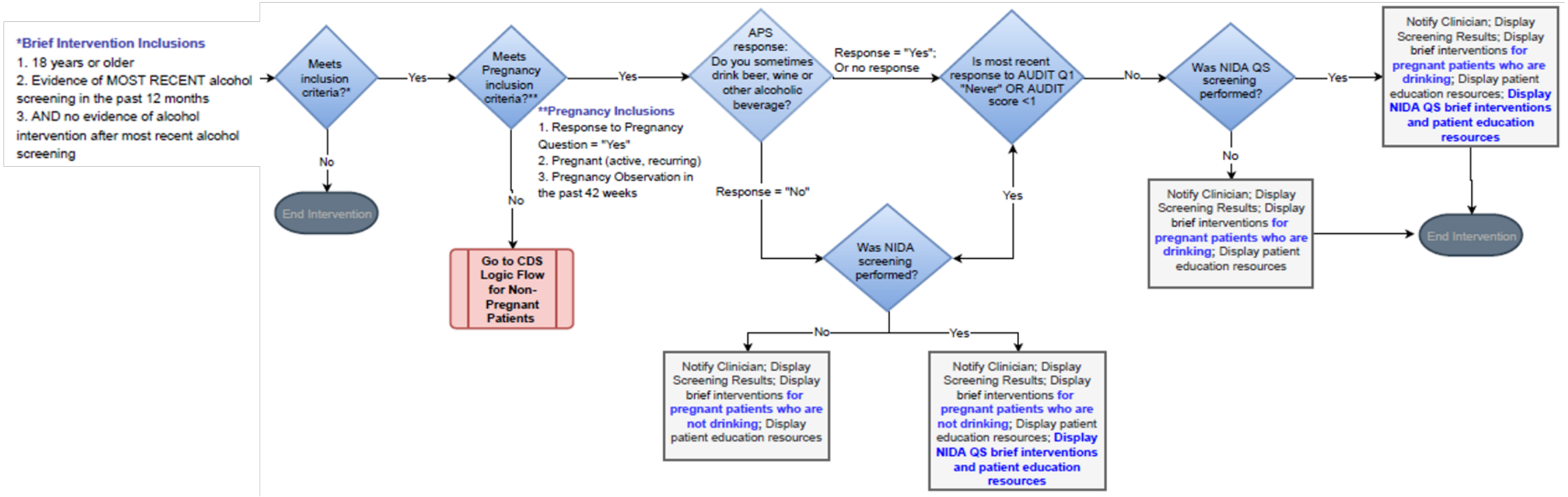
Intervention Information Displayed to the Clinician

- 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:

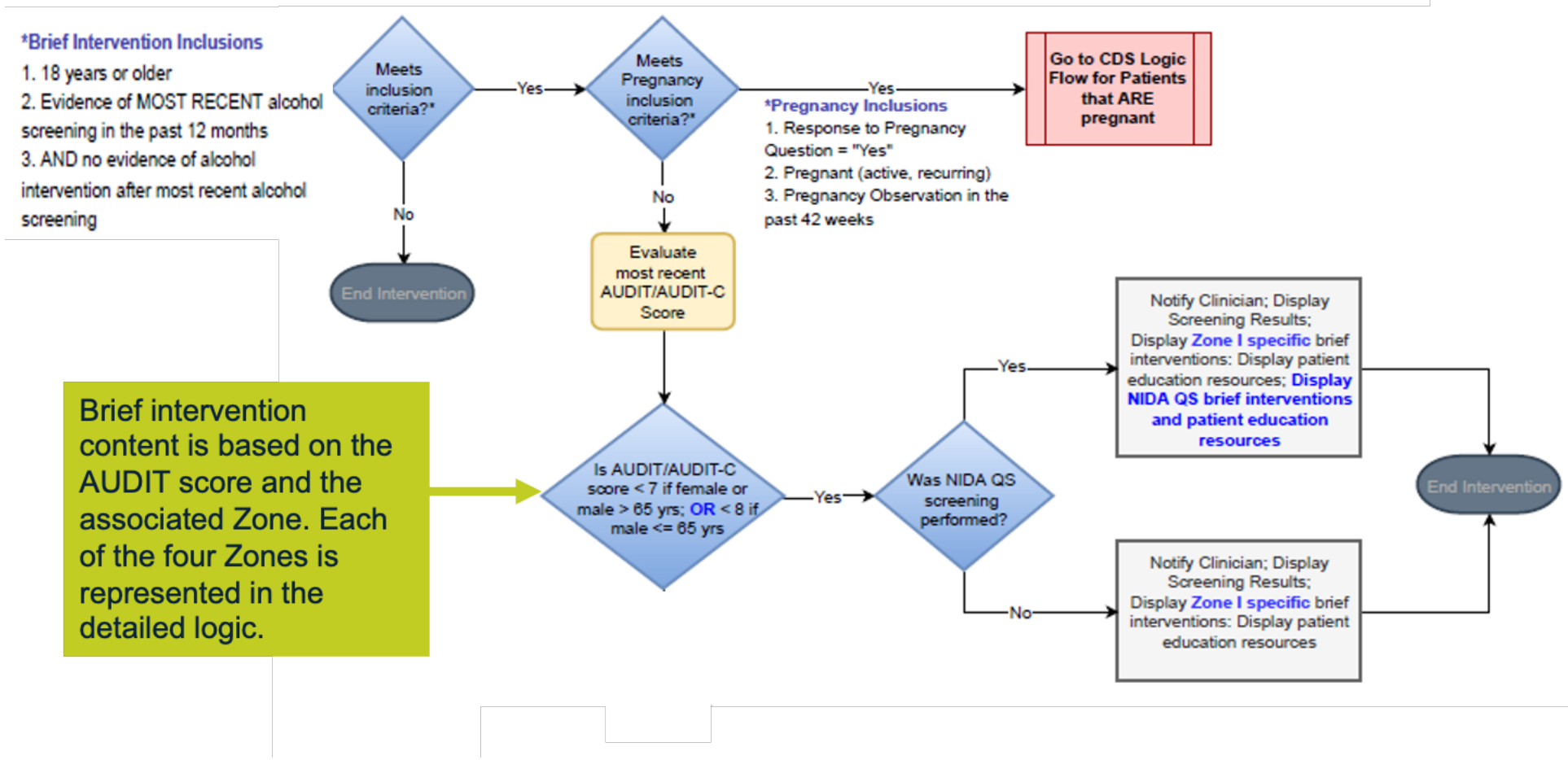
1. Logic to determine evidence of either AUDIT screening results or an alcohol prescreen question response within the past 12 months, with no evidence of an associated brief intervention
2. Evidence that the patient is pregnant or trying to become pregnant
3. Evaluation of NIDA Quick Screen responses, 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.

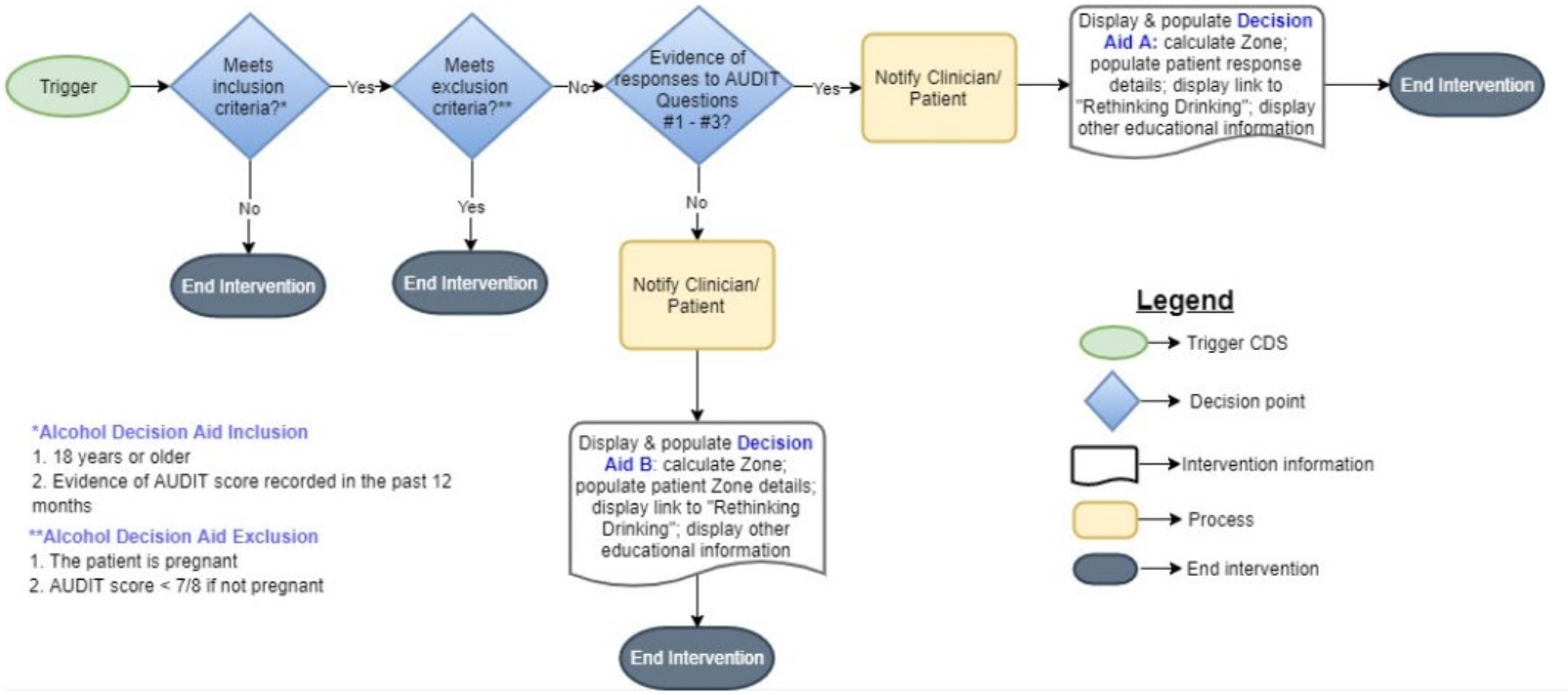
Patient Decision Aid CDS Tool

- 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"***

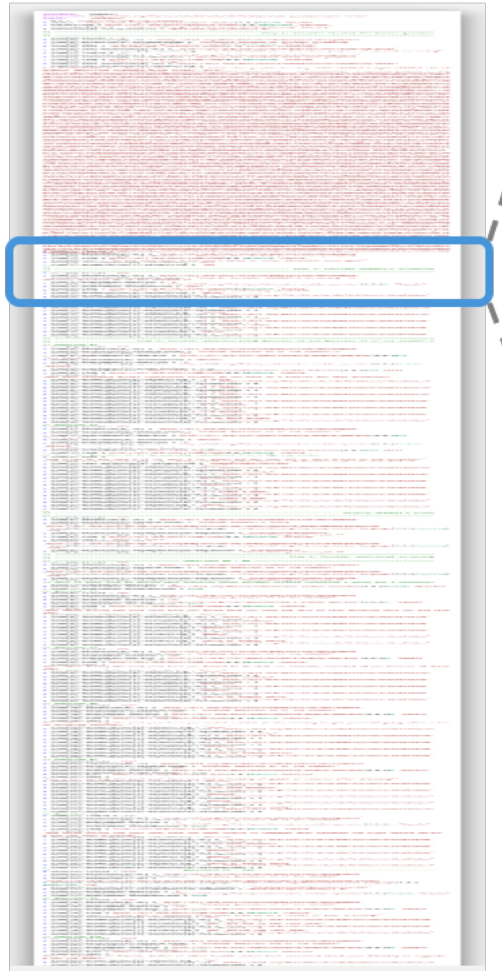
Clinical Quality Language (CQL) Library: ***"The logic"***

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

```
* item[3].linkId = "3"
* item[3].extension[0].url = "http://hl7.org/fhir/StructureDefinition/designNote"
* item[3].extension[0].valueMarkdown = "Step 2: Consider USAUDIT-C Screening  \\
nDisplay Question #1 of the USAUDIT-C"
* item[3].enableWhen.question = "2"
* item[3].enableWhen.operator = http://hl7.org/fhir/questionnaire-enable-operator|4.0.1#= "Equals"
* item[3].enableWhen.answerString = "Yes"
* item[3].type = http://hl7.org/fhir/item-type|4.0.1#choice "Choice"
* item[3].text = "How often do you have a drink containing alcohol?"
```

- **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)

MITRE

Alcohol Screening CDS Definition: CQL Library

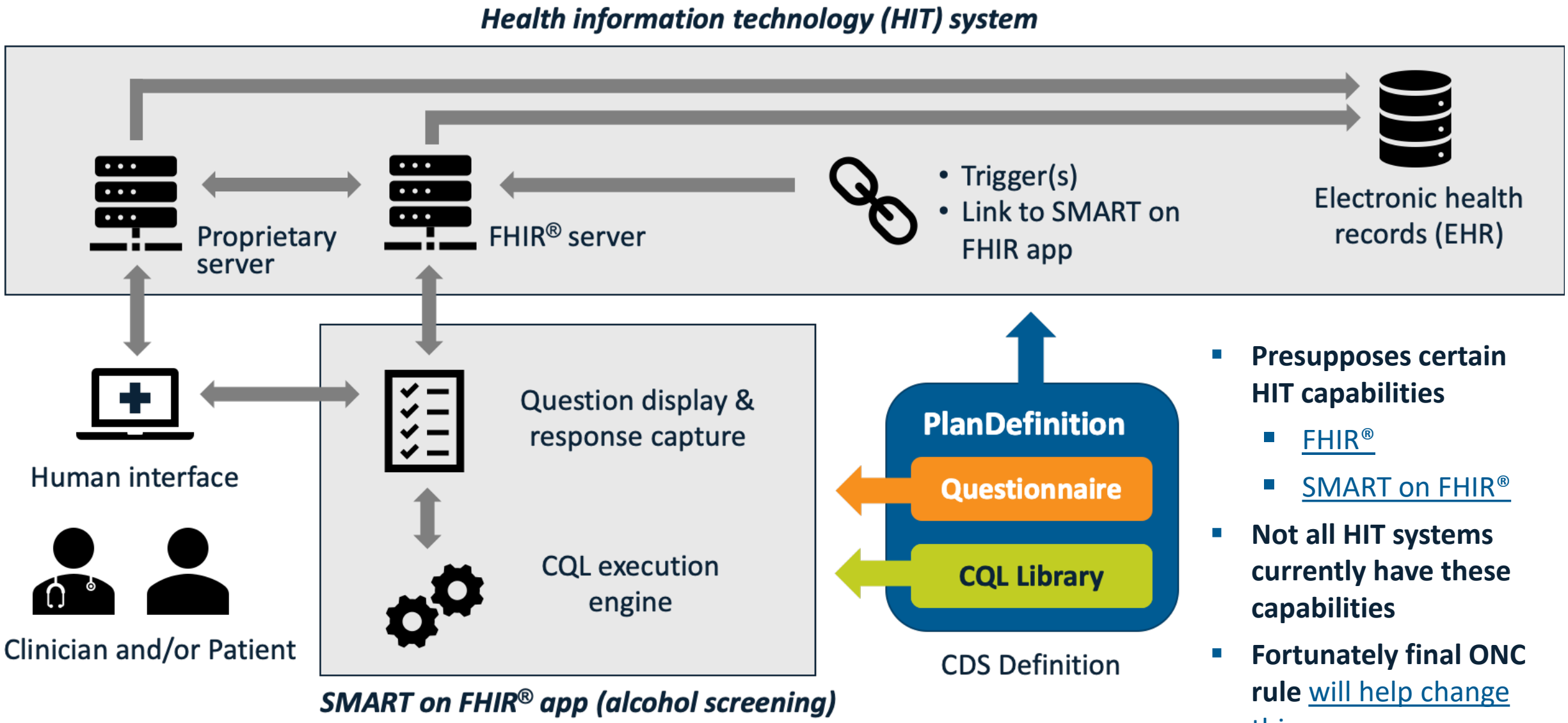
USAUDIT (364 lines)

USAUDIT Definition in FHIR® Shorthand (FSH): Reference to CQL Library

```
* item[6].text = "AUDIT-C Score"
* item[6].extension[2].url =
"http://hl7.org/fhir/uv/sdc/StructureDefinition/sdc-questionnaire-calculatedExpression"
* item[6].extension[2].valueExpression.language = http://hl7.org/fhir/expression-language|4.0.1
#text/cql "CQL"
* item[6].extension[2].valueExpression.expression = "ScoreUsAuditC"
* item[6].extension[2].valueExpression.reference = "#UsAuditLogicLibrary|1.0"
```

- **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



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

MITRE

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	Status	Experimental
1.0	Draft	True

ARTIFACT CREATION AND USAGE

Steward
Centers for Disease Control and Prevention

Publisher
The MITRE Corporation

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).

Each artifact includes:

- Descriptive metadata
- An implementation guide, which includes a decision log
- A CDS flow diagram
- The CDS computer code and test files
- Hyperlinks to related apps, resources and software

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

MITRE

Pilot Discussion

Pilot Goals and Objectives

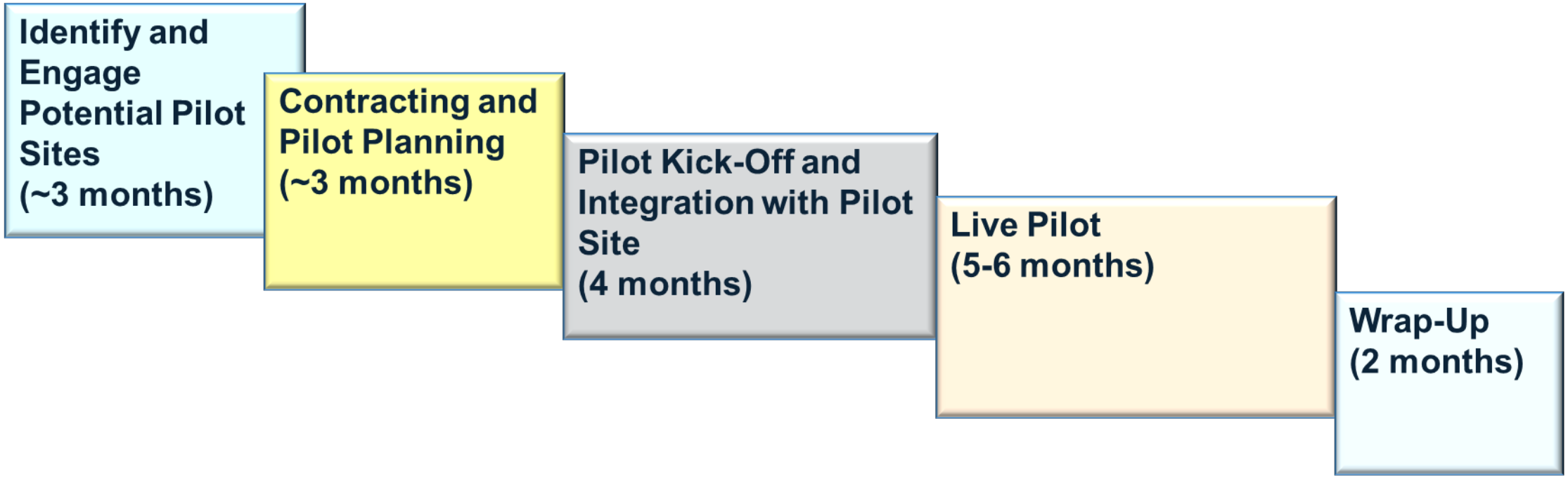
- **Evaluate the performance of the ASBI CDS in a clinical setting by piloting one CDS screening tool and up to two CDS brief intervention tools**
- **Secondary goals:**
  - Drive improved public health outcomes by enabling consistent interpretation and implementation of evidence-based guidelines for 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



Thank You!
Questions and Comments?

References

1. Babor, T. F., & Higgins-Biddle, J. C. (2001). *Brief Intervention for Hazardous and Harmful Drinking: A Manual for Use in Primary Care*. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/67210/WHO_MSD_MSB_01.6b.pdf?sequence=1
2. Babor, T. F., Higgins-Biddle, J. C., & Robaina, K. (2017). The Alcohol Use Disorders Identification Test, Adapted for Use in the United States: A Guide for Primary Care Practitioners, 24. Retrieved from https://www.dshs.wa.gov/sites/default/files/BHSIA/dbh/wasbirt/USAUDIT-Guide_2016.pdf
3. National Institute on Drug Abuse. (2009). Screening for Drug Use in General Medical Settings: A Resource Guide for Providers. Retrieved from https://www.drugabuse.gov/publications/resource-guide-screening-drug-use-in-general-medical-settings/introduction

Ginny Meadows

jmeadows@mitre.org

MITRE | SOLVING PROBLEMS FOR A SAFER WORLD™

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