Enabling USCDI with FHIR US Core and C-CDA

USCDI Design Now and Future

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HL7® FHIR®

HL7® CDA®

Speaker

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- Principal, WaveOne Associates
- Extensive EHR experience
- Primary Editor, Argonaut Data Query IG / US FHIR Core IG
- Primary Editor, C-CDA, C-CDA Companion Guides
- Project Manager Argonaut
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US Core Data for Interoperability

The USCDI is a standardized set of health data classes and constituent data elements for nationwide, interoperable health information exchange.

USCDI v2 Summary of Data Classes and Data Elements

Allergies and Intolerances
- Substance (Medication)
- Substance (Drug Class)
- Reaction

Assessment and Plan of Treatment
- Assessment and Plan of Treatment
- SDOH Assessment

Care Team Member(s)
- Care Team Member Name
- Care Team Member Identifier
- Care Team Member Role
- Care Team Member Location
- Care Team Member Telecom

Clinical Notes
- Consultation Note
- Discharge Summary Note
- History & Physical
- Procedure Note
- Progress Note

Goals
- Patient Goals
- SDOH Goals

Health Concerns
- Health Concerns

Immunizations
- Immunizations

Laboratory
- Tests
- Values/Results

Medications
- Medications

Patient Demographics
- First Name
- Last Name
- Previous Name
- Middle Name (including Middle Initial)

Procedures
- Procedures
- SDOH Interventions

Provenance
- Author Time Stamp
- Author Organization

Smoking Status
- Smoking Status

Unique Device Identifier(s) for a Patient's Implantable Device(s)
- Unique Device Identifier(s) for a Patient's Implantable Device(s)

Vital Signs
- Diastolic Blood Pressure
- Systolic Blood Pressure

https://www.healthit.gov/isa/united-states-core-data-interoperability-uscdi

Our view on USCDI

It is **Data Policy**

- standards agnostic
- use case agnostic
- sets a **floor** for standardization
- allows for further standards development for specific use cases

US Core Implementation Guide

Foundational US guide that maps USCDI to FHIR

HL7 International

US Core Implementation Guide
5.0.1 - STU5 Release US

HL7 FHIR

Home | Conformance | Guidance | FHIR Artifacts | Security | Examples | Downloads | Change Log

Table of Contents > **Home**

This page is part of the US Core (v5.0.1: STU5) based on FHIR R4. This is the current published version. For a full list of available versions, see the Directory of published versions

1 Home

Official URL: `http://hl7.org/fhir/us/core/ImplementationGuide/hl7.fhir.us.core`	*Version*: `5.0.1`
Active as of 2022-06-13	*Computable Name*: `USCore`
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STU Note
Key updates and detailed changes between this and prior versions are available in the US Core Change Log

1.1 Introduction

The US Core Implementation Guide is based on FHIR Version R4 and defines the minimum set of constraints on the FHIR resources to create the US Core Profiles. It also defines the minimum set of FHIR RESTful interactions for each of the US Core Profiles to access patient data. By establishing the "floor" of standards to promote interoperability and adoption through common implementation, it allows for further standards development evolution for specific uses cases. There are two different ways to implement US Core:

1. Profile Only Support: Systems may support *only* the US Core Profiles to represent clinical information.
2. Profile Support + Interaction Support: Systems may support *both* the US Core Profile content structure *and* the RESTful interactions defined for a resource.

For a detailed description between these different usages of US Core, see the Conformance Requirements page.

Consolidated CDA (C-CDA)

24M C-CDA documents are exchange daily in support of patient care. The C-CDA Companion Guide provides a mapping of USCDI to C-CDA.


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HL7 CDA® R2 Implementation Guide:

C-CDA Templates for Clinical Notes STU Companion Guide

Release 3 (US Realm)

Standard for Trial Use

May 2022

US CORE ENABLES USCDI

US Core Implementation Guide

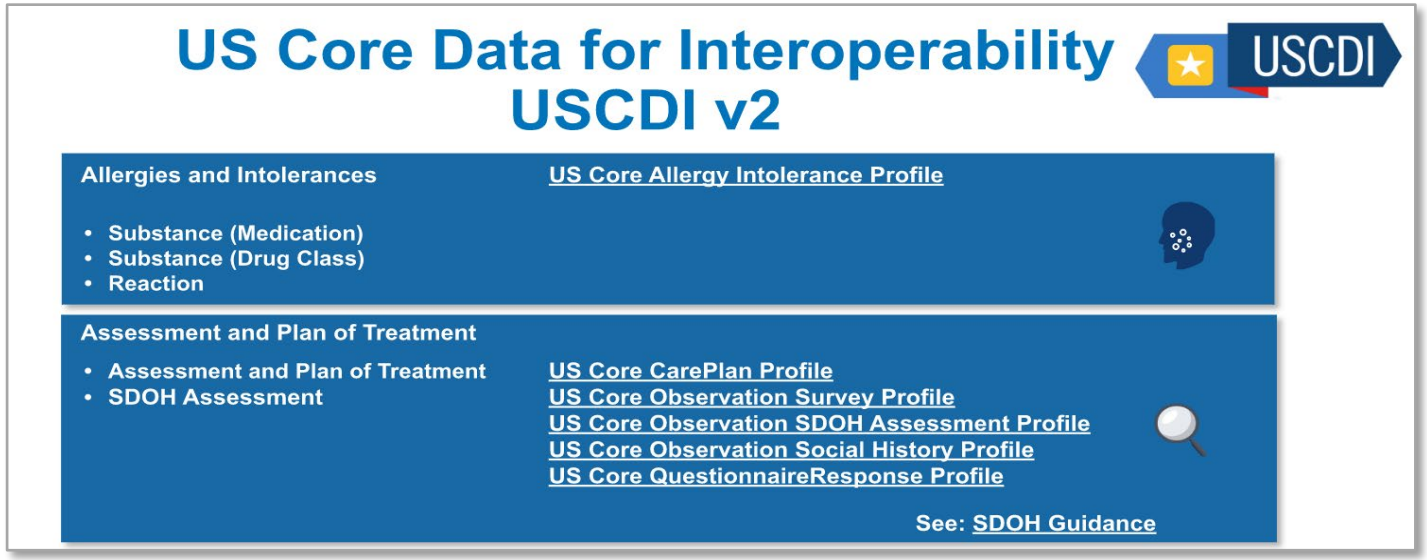
- Built from Argonaut requirements
- US Core profiles *supersede* Argonaut Data Query profiles for FHIR R4
  - Version 3.1.1 published June 2020
- HL7 balloted US Realm FHIR profiles
  - Supports *United States Core Data for Interoperability (USCDI) which* superseded the *Common Clinical Data Set*
  - Used by US stakeholders when implementing FHIR
  - Basis for creating further US Realm profiles.

…fun fact: the Data Access Framework (DAF) = ONC sponsored DAF effort on FHIR preceded the Argonaut guide!

US Core 5.0.1

- Support for **ONC's USCDI v2**
- Resolved 100+ trackers
- New Change Log
- Improved Conformance and Guidance sections

http://hl7.org/fhir/us/core/



USCDI to US Core Profile Mapping

USCDI
Data Class/Element → US Core Profile

Patient Demographics	US Core Patient Profile
• Name	
• Last Name	
• Previous Name	
• Middle Name (incl. middle initial)	
• Suffix	
• Sex (Assigned at Birth)	US Core Birth Sex Extension
• Sexual Orientation	US Core Sexual Orientation Observation Profile
• Gender Identity	US Core Gender Identity Extension
• Date of Birth	
• Race	US Core Race Extension
• Ethnicity	US Core Ethnicity Extension
• Preferred Language	
• Current Address	
• Previous Address	
• Phone Number	
• Phone Number Type	
• Email Address	

http://hl7.org/fhir/us/core/uscdi.html

US Core Terminology to Align with USCDI

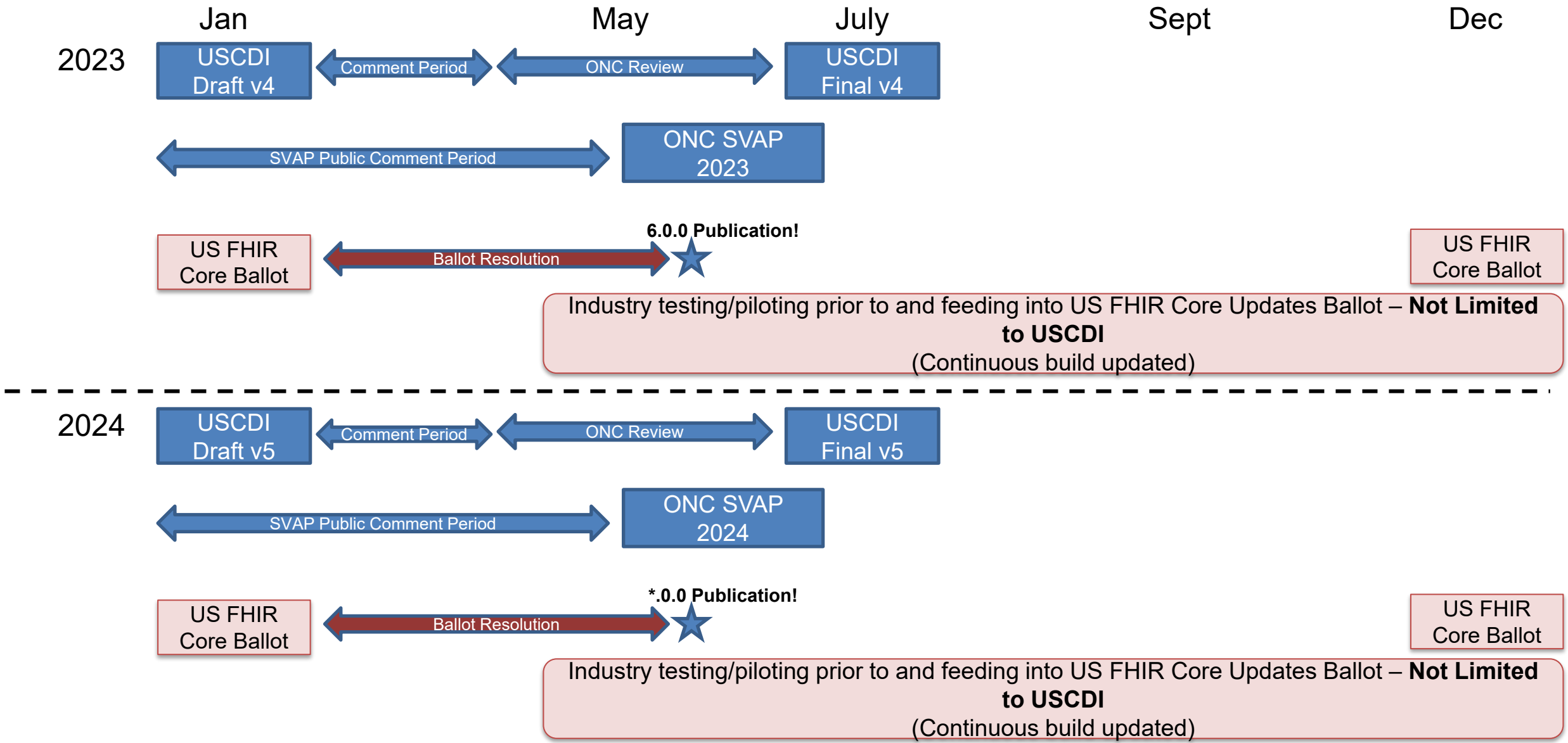
20+ Value Sets defined in US Core + over a dozen more referenced from NLM Value Set Authority Center (VSAC)!

US Core Publication History

USCDI Version	US Core Version
V1	3.1.1
V1	4.0.0
V2	5.0.1
V3	6.0.0 (May 2023)

http://hl7.org/fhir/us/core/history.html

- US FHIR Core will ballot every January
- The ballot will reflect HL7 update requests (JIRA) and response to USCDI v+1.
- Connect-a-thons/pilot testing precede US FHIR Core Update Ballot.



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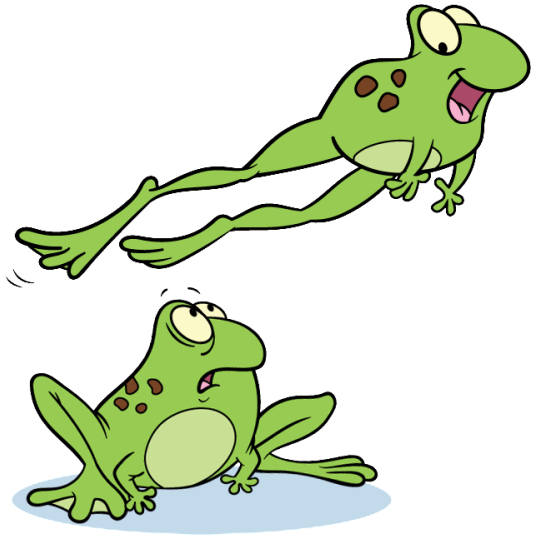
HL7 FHIR

US CORE ≠ ONC USCDI

US CORE > ONC USCDI (HL7 new ballot)

US CORE < ONC USCDI (ONC new rule)



Continuous game of leapfrog!

Validation

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Health Information Technology

INFERNO

Inferno Framework is a rigorous and extensible testing development framework for HL7® FHIR® and beyond.

This is an instance of Inferno hosted by ONC for purposes of testing for the ONC Health IT Certification Program and to support community-driven health IT standards development projects. You can build your own tests using Inferno Framework and host your own local instance of Inferno by following the instructions in "Inferno Development Framework" below.

ONC HOSTED TESTS AND UTILITIES

ONC Health IT Certification Program

ONC maintains and hosts an open source certification testing kit for systems seeking to meet the requirements of the Standardized API for Patient and Population Services criterion § 170.315(g)(10) in the 2015 Edition Cures Update.

(g)(10) Standardized API Test Kit

Download

(Legacy) Inferno Program Edition

Download

INFERNO DEVELOPMENT FRAMEWORK

Inferno Framework

The Inferno Framework is a standards conformance testing framework. You can use it to develop tests for your own use cases, like HL7 FHIR implementation Guide conformance testing.

The building blocks of Inferno Framework include 'Inferno Core' and 'Test Kits'. You can get started building your own tests using the 'Test Kit' template repository on Github here.

Learn More

https://inferno.healthit.gov/

Testing and Community Feedback

- Testing
  - Formal Events at HL7 ”Connectathons”
  - Reference Implementations supporting the published profiles
  - Informal pilots
- Feedback
  - Certifiers
  - Testers
  - Other Implementers
  - FHIR Community

C-CDA ENABLES USCDI

C-CDA Companion Guides

US C-CDA guides that maps USCDI to CDA

USCDI Version	Companion Guide Release
V1	C-CDA Companion Guide Release 2
V2	C-CDA Companion Guide Release 3
V3	C-CDA Companion Guide Release 4 (2023)
V4	New ballot of C-CDA + USCDI in a Web Publication similar to FHIR

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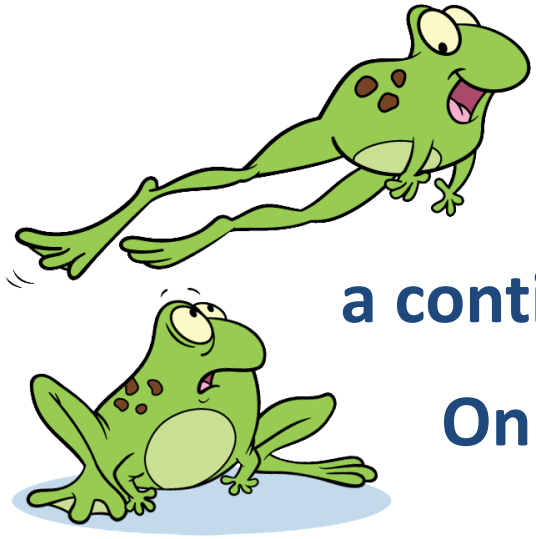
HL7 FHIR

C-CDA Updates for USCDI is also



a continuous game of leapfrog!

On the same annual schedule ….

But a little less lean ….

C-CDA and Related Guides

- 2007: Continuity of Care Document (CCD) was first published
- 2007-2010: 10+ Common Clinical Document Types published
- 2011: Consolidated CDA release 1.0 migrated the Common Clinical Document Types into one IG to re-use and align templates
- 3 new versions, 4 Companion Guides, 5 Supplemental Guides, many errata later…

….it Grew!

USCDI v2: C-CDA Companion Guide *R3*

- Main Volume:
  - Text Guidance
- Appendix A:
  - Templates covering USCDI v1 and v2 related to C-CDA R2.1 Templates
- Appendix B:
  - Templates covering the USCDI UDI Data Class Elements*

CDAR2_IG_CCDA_COMPANION_R3_STU_2022MAY.pdf
CDAR2_IG_CCDA_COMPANION_R3_STU_2022MAY_AppxA.pdf
CDAR2_IG_CCDA_COMPANION_R3_STU_2022MAY_AppxB.pdf
readme.txt


CDAR2_IG_CCDA_COMPANION_R3_STU_2022MAY

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HL7 CDA® R2 Implementation Guide:

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Release 3 (US Realm)

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May 2022

C-CDA online

HL7 CDA

C-CDA Online: A navigation website for C-CDA 2.1

This beta navigation tool is generated from the published PDF of the Consolidated Clinical Document Architecture (C-CDA) 2.1 (June 2019 Errata) and the C-CDA 2.1 Companion Guide R2 (October 2021 Errata). For the latest information on C-CDA, or to access the Supplemental Implementation Guides, please refer to the HL7 C-CDA Page.

CDA and C-CDA are copyright property of Health Level Seven (HL7) and subject to the terms of HL7's IP policy. Those terms are also included in Volume 1 of the C-CDA guide linked below.

HL7 encourages users to sign up for an account, which is free!

Please sign up if you do not have an account.

Read Narrative Introductions

C-CDA 2.1 Introduction (Volume 1)

C-CDA 2.1 Companion Guide

Navigate Templates (C-CDA Volume 2 and Companion Guide Appendices)

Search C-CDA by description, template OID or conformance number

http://www.hl7.org/ccdasearch/

C-CDA Examples

HL7 International

HL7 CDA Example Search

Help Report an Issue

Name	
Allergies Allergies and Intolerances Section Examples from C-CDA	SECTION EXAMPLES
Care Team Care Team Examples from C-CDA Companion Guide	SECTION EXAMPLES
Encounters Encounter Section Examples from C-CDA	SECTION EXAMPLES

Validation

HealthIT.gov

Edge Testing Tool

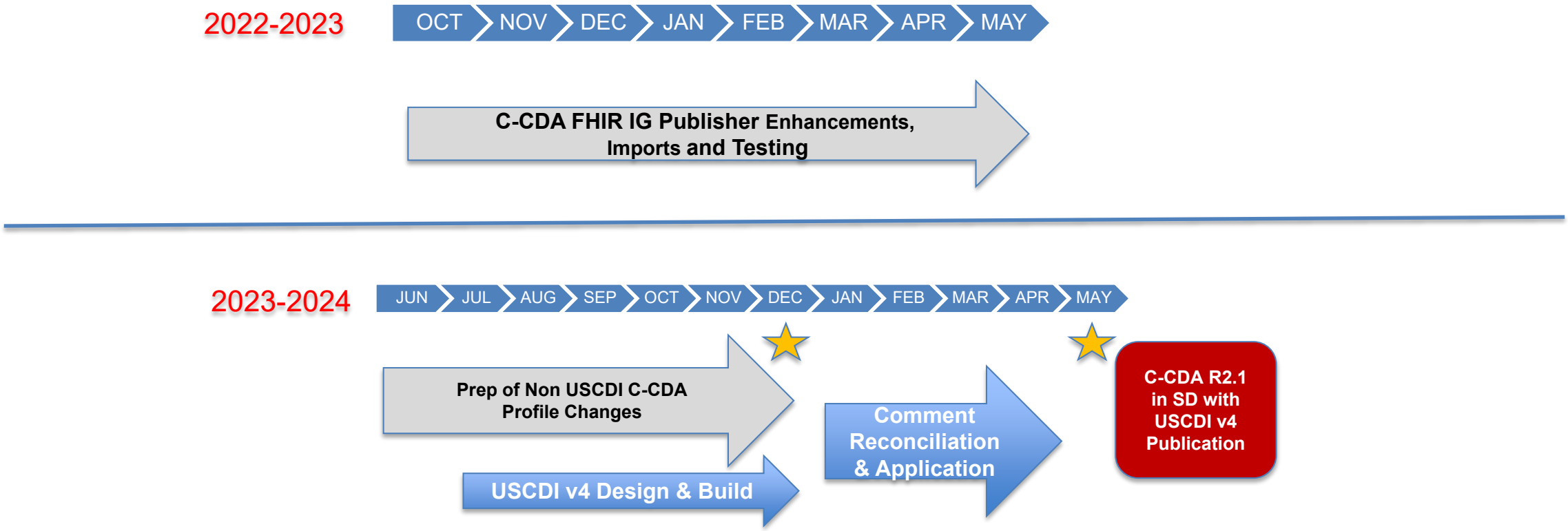
The Edge Testing Tool is a collection of testing utilities created to validate the requirements of the 2015 Edition and the 2015 Edition Cures Update Health IT Certification Program. The Edge Testing Tool was originally designed to test only network "Edge" capabilities, but over time assumed HISP and other transport testing abilities, along with C-CDA and content validation utilities. The Edge Testing Tool software is open source and available for download. Note: 2014 Edition tools removed from ETT on the Effective Date of the ONC Cures Act Final Rule (June 30th).

Direct Testing	Message Validators	Edge Testing
HISP Testing & Delivery Notification	2015 Edition Testing by Criteria	Surveillance Testing

https://ett.healthit.gov/ett/#/home

C-CDA Roadmap USCDI v4 and Beyond: Web Pub

Draft Plan 2022-2024: C-CDA Using FHIR SD Publisher



C-CDA AND US CORE DESIGN ALIGNMENT

Cross Pollination of Design Teams

- There are many similarities between CDA and FHIR
- The CDA RMIM informed the original International FHIR Core design
- The industry benefits when federally supported and recommended standards align where possible

Cross Pollination of Design Teams

US Core

- Eric Haas
- Brett Marquard
- Gay Dolin

C-CDA Companion Guide

- Brett Marquard
- Gay Dolin
- Russ Ott

USCDI Standards Alignment

- Mapping USCDI to C-CDA and FHIR US Core is
  - 70%: Straightforward
  - 20%: Multiple approaches
  - 10%: Unclear
  - US Core and C-CDA Design sessions inform each other

Vocabulary/Value Set alignment

- Over a dozen value sets are the same (and are in VSAC)
- Over 20 value sets are similar
- Future
  - The goal is to increase reuse across both standards
  - In some cases, the syntax (data structure) is different enough that the value sets can be similar, but not the same

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Thank-you!!