

Inferno Tech Talk – Dec 2023

Yunwei Wang

MITRE Inferno Team

December 13, 2023

MITRE | SOLVING PROBLEMS
FOR A SAFER WORLD™

Inferno Tech Talk Introduction

- Purpose: to provide regularly scheduled updates on the Inferno tool and its implementation of the (g)(10) test procedure
- Typical agenda to include:
 - Announcements about upcoming releases
 - Training on new features
 - Highlight outstanding issues or known problems
 - Open discussion
- Monthly recurrence: 2nd Wednesday at 1PM ET

Content reflects Inferno's implementation of applicable Test Procedure and does not necessarily reflect ONC policy.

Today's Agenda

- (g)(10) Standardized API Test Kit v4.1.0
- Other Updates
- Discussions / Questions

ONC (g)(10) Standardized API Test Kit v4.1.0

- Test Update:
 - Changes that may result in new failure: 4
- Other Updates: 1

Other Change: New Inferno Core

- Inferno Core v0.4.24
- Database Migration
 - Docker
 - setup.sh
 - Ruby
 - bundle exec inferno migrate

Blood Pressure component.dataAbsentReason

■ US Core 4.0.0, all Vital Sign profiles:

- An Observation without a value, **SHALL** include a reason why the data is absent *unless* there are 1) component observations, or 2) reporting vital signs panel components using `Observation.hasMember`.
 - *Systems that never provide an observation without a value are not required to support `Observation.dataAbsentReason`

■ US Core 5.0.1, Blood Pressure profile:

- An Observation without a systolic or diastolic result value, **SHALL** include a reason why the data is absent in `Observation.component.dataAbsentReason`
 - Because all the components are *mandatory* (in other words the minimum cardinality is =>1), all server systems - including those that never provide a component observation without a value - must to support `Observation.component.dataAbsentReason` for the components.

■ US Core 6.1.0, Blood Pressure profile:

- Because the blood pressure values are communicated in the *mandatory* systolic and diastolic components:
 - the `Observation.value[x]` element **SHOULD** be omitted
 - an Observation without a systolic or diastolic result value, **SHALL** include a reason why the data is absent in `Observation.component.dataAbsentReason`
 - *all server systems* - including those that never provide a component observation without a value - **SHALL** support `Observation.component.dataAbsentReason` for the components.

Restore component.dataAbsentReason MS

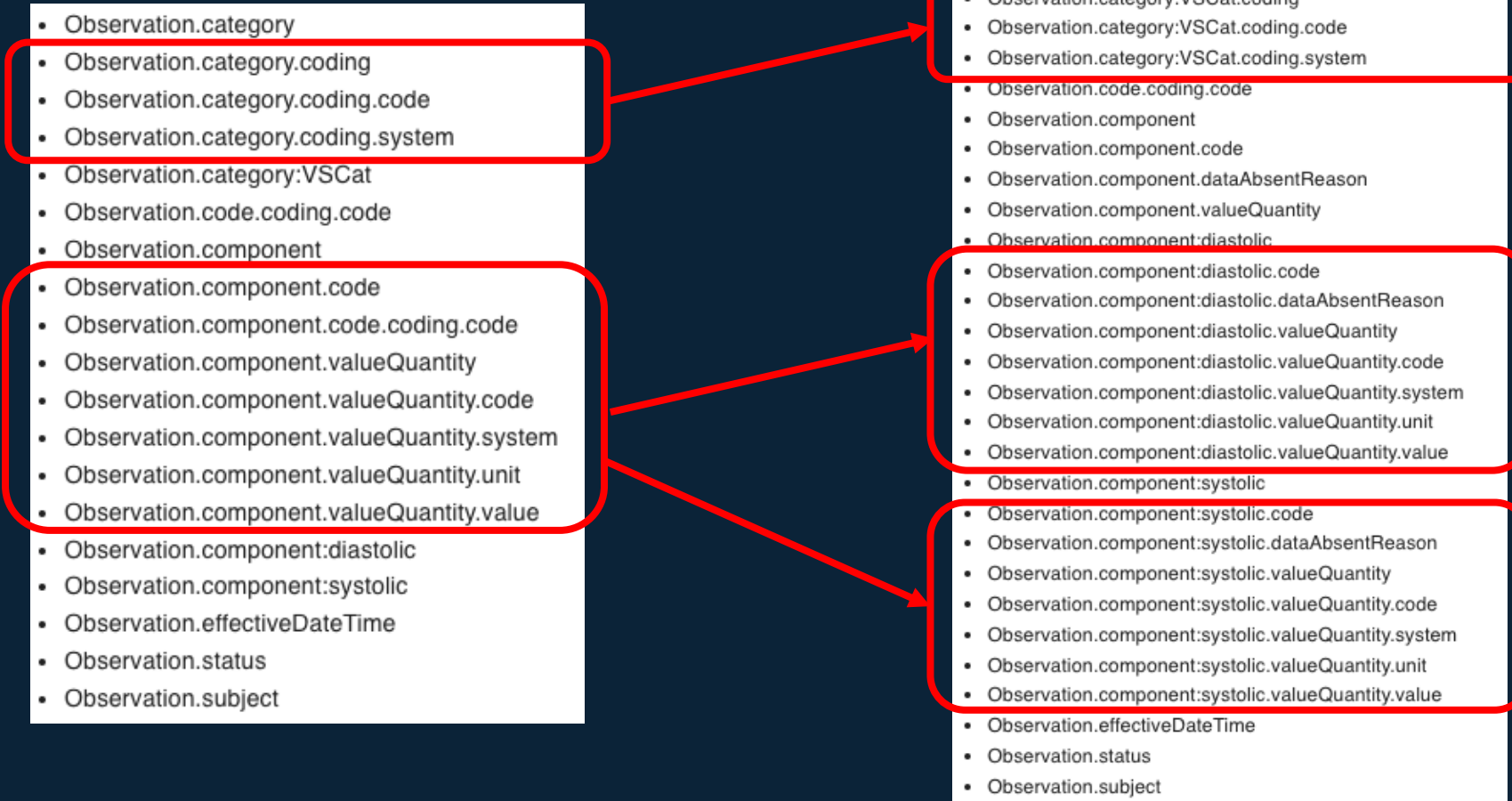
- What Changed:
 - Add component.dataAbsentReason MustSupport for Observation Blood Pressure profile
- Versions applied:
 - US Core v5.0.1
 - US Core v6.1.0
- Profile applied:
 - US Core Observation Blood Pressure profile

- Observation.category
- Observation.category:VSCat
- Observation.category:VSCat.coding
- Observation.category:VSCat.coding.code
- Observation.category:VSCat.coding.system
- Observation.code.coding.code
- Observation.component
- Observation.component.code
- Observation.component.dataAbsentReason
- Observation.component.valueQuantity
- Observation.component:diastolic
- Observation.component:diastolic.code
- Observation.component:diastolic.dataAbsentReason
- Observation.component:diastolic.valueQuantity
- Observation.component:diastolic.valueQuantity.code
- Observation.component:diastolic.valueQuantity.system
- Observation.component:diastolic.valueQuantity.unit
- Observation.component:diastolic.valueQuantity.value
- Observation.component:systolic
- Observation.component:systolic.code
- Observation.component:systolic.dataAbsentReason
- Observation.component:systolic.valueQuantity
- Observation.component:systolic.valueQuantity.code
- Observation.component:systolic.valueQuantity.system
- Observation.component:systolic.valueQuantity.unit
- Observation.component:systolic.valueQuantity.value
- Observation.effectiveDateTime
- Observation.status
- Observation.subject

MustSupport elements within a MustSupport slice

Inferno 4.1.0

Inferno 4.0.0



MustSupport elements within a MustSupport slice


Slices for component		2..*	BackboneElement	Fixed Value: 85354-9 (USCDI) Component observations Slices: Unordered, Open by pattern code
component:systolic	S	1..1	BackboneElement	(USCDI) Systolic Blood Pressure
code	S	1..1	CodeableConcept	(USCDI) Systolic Blood Pressure Code
coding	S	1..*	Coding	(USCDI) Systolic Blood Pressure Code Required Pattern: At least the following Code defined by a terminology system Fixed Value: (complex)
system	S	1..1	uri	Identity of the terminology system Fixed Value: http://loinc.org
code	S	1..1	code	Symbol in syntax defined by the system Fixed Value: 8480-6
valueQuantity	S	0..1	Quantity	(USCDI) Vital Sign Component Value
value	S	1..1	decimal	(USCDI) Numerical value (with implicit precision)
unit	S	1..1	string	(USCDI) Unit representation
system	S	1..1	uri	(USCDI) System that defines coded unit form Fixed Value: http://unitsofmeasure.org
code	S	1..1	code	(USCDI) Coded form of the unit Fixed Value: mm[Hg]
component:diastolic	S	1..1	BackboneElement	(USCDI) Diastolic Blood Pressure
code	S	1..1	CodeableConcept	(USCDI) Diastolic Blood Pressure Code
coding	S	1..*	Coding	(USCDI) Diastolic Blood Pressure Code Required Pattern: At least the following Code defined by a terminology system Fixed Value: (complex)
system	S	1..1	uri	Identity of the terminology system Fixed Value: http://loinc.org
code	S	1..1	code	Symbol in syntax defined by the system Fixed Value: 8462-4
valueQuantity	S	0..1	Quantity	(USCDI) Vital Sign Component Value
value	S	1..1	decimal	(USCDI) Numerical value (with implicit precision)
unit	S	1..1	string	(USCDI) Unit representation
system	S	1..1	uri	(USCDI) System that defines coded unit form Fixed Value: http://unitsofmeasure.org
code	S	1..1	code	(USCDI) Coded form of the unit Fixed Value: mm[Hg]

MustSupport elements within a MustSupport slice

- What Changed:
 - MustSupport elements are moved under parent's MustSupport slice
- Versions applied:
 - All US Core versions
- Profiles applied:
 - All US Core profiles
 - In practice:
 - US Core Coverage in US Core v6.1.0
 - US Core Observation Occupation in US Core v6.1.0

Reference validation on single target profile

- Ex: AllergyIntolerance.patient
- Inferno 4.0.0
 - "patient" element is MS.
 - Reference(US Core Patient Profile) is not MS
- US Core Conformance Expectation (US Core 4.0.0 - 2.2.5.4)

 patient	S	1..1	Reference(US Core Patient Profile)	Who the sensitivity is for
---	----------	------	------------------------------------	----------------------------

In certain profiles only a single resource reference is present on an element labeled *Must Support*.

For example, the [US Core AllergyIntolerance Profile](#) patient is labeled *Must Support*. When claiming conformance to the [US Core AllergyIntolerance Profile](#):

- US Core Responders **SHALL** be capable of providing an [AllergyIntolerance.patient](#) with a valid reference to a US Core Patient Profile.
- US Core Requestors **SHALL** be capable of processing an [AllergyIntolerance.patient](#) with a valid reference to a US Core Patient Profile.

Figure 11: US Core AllergyIntolerance.patient

 patient	S	1..1	Reference(US Core Patient Profile)	Who the sensitivity is for
---	----------	------	------------------------------------	----------------------------

Reference validation on single target profile

- What changed:
 - Single target profile on a MustSupport element is treated as MustSupport
- Versions applied:
 - US Core 4.0.0
 - US Core 5.0.1
 - US Core 6.1.0
- Profiles applied:
 - All US Core profiles
- Test affected:
 - Reference validation test
 - At least one reference is accessible **AND is a valid US Core resource**

fhirContext in SMART

- fhirContext is optional in SMART app launch token response ([link](#))

```
{  
  "access_token": "secret-xyz",  
  "patient": "123",  
  "fhirContext": ["DiagnosticReport/123", "Organization/789"],  
  //...  
}
```

- What changed:
 - Inferno validates the format of fhirContext, if provided in token response.
- Versions applied:
 - SMART App Launch v2.0.0



HTI-1

- HTI-1 Rule is finalized today ([link](#))
- Preview of Token Introspection tests added to SMART App Launch STU2 suite
 - Feedback welcome as we prepare to update (g)(10) Tests for HTI-1

The screenshot displays the SMART App Launch STU2 v.0.4.0 interface. On the left, a navigation pane shows the test suite structure: SMART App Launch STU2, 1 Standalone Launch, 2 EHR Launch, 3 Token Introspection (selected), 3.1 Request New Access Token to Introspect, 3.2 Issue Token Introspection Request, 3.3 Validate Token Introspection Response, and Report. The main content area is titled "3 Token Introspection" and includes a "RUN ALL TESTS" button. It features a "Background" section explaining OAuth 2.0 Token introspection and a "Test Methodology" section detailing the three test groups: 1. Request Access Token Group, 2. Issue Token Introspection Request Group, and 3. Validate Token Introspection Response Group. Below the methodology, there are three radio buttons for selecting individual test groups: 3.1 Request New Access Token to Introspect, 3.2 Issue Token Introspection Request, and 3.3 Validate Token Introspection Response.

US Core 5 test in (g)(10) certification

For the ONC Health IT Certification Program, developers may certify using the following standards under the Standards Version Advancement Process (SVAP) until December 31, 2023:

- [United States Core Data for Interoperability \(USCDI\), Version 2, July 2021](#)
- [HL7® CDA R2 Implementation Guide: C-CDA Templates for Clinical Notes R2.1 Companion Guide, Release 3-US Realm, May 2022](#) 
- [HL7® FHIR® US Core Implementation Guide STU 5.0.1, June 2022](#) 

Certification testing tools for SVAP 2023 approved standards (e.g., USCDI v3 and related standards) may be released before that date, but the option to certify using the above listed standards will remain available until December 31, 2023. After December 31, 2023, developers will no longer be able to certify using the above listed standards via SVAP.

- US Core 5.0.1 will be removed from (g)(10) certification test in the next release
- Inferno will post a survey on zulip on options of keeping existing test results

US Core v7.0.0 ballot

- US Core v7.0.0 January Ballot
 - Ballot signup deadline: Dec 21
 - Ballot opens: Dec 22
 - January Connectathon 35: US Core testing track ([link](#))

Open Discussion / Feedback

Resources and Contact Information

- <https://inferno.healthit.gov/>
 - General materials & live demonstration server
- <https://github.com/onc-healthit/onc-certification-g10-test-kit/>
 - ONC Certification tests repository, downloads, issues
 - “Watch” repository to receive alerts (new releases, etc)
 - Note: this repository is specific to ONC Certification testing
- <https://groups.google.com/forum/#!forum/inferno-testing>
 - Announcements & community discussion
- inferno@groups.mitre.org (or rscanlon@mitre.org)
- Also, FHIR Zulip Chat: <https://chat.fhir.org/#narrow/stream/179309-inferno>

Upcoming Meetings

- Next Inferno Tech Talk: **Wednesday January 10** at 1 PM ET
- Please reach out with questions & issues

NOTICE

This 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.

© 2023 The MITRE Corporation.