Background Information for Proposal for Mapping Author and Informant Information to FHIR US Core Profiles for FHIR Resources Derived from C-CDA Documents

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Need

Data exchange requirements stemming from the new Cures Act final rule have increased implementer needs for guidance on how to transform USCDI v1 data elements between C-CDA and FHIR US Core formats. Currently it is unclear how to map C-CDA participations to FHIR US Core compliant resources derived from C-CDA documents.

This proposal provides specific guidance implementers need to implement transformations using a semantically accurate and consistent approach.

Scope

This proposal provides guidance on how to map author, performer and informant information from C-CDA documents to the full range of USCDI v1 data addressed with US Core Profiles. Although the supporting examples focus on the US Core Condition and US Core AllergyIntollerance profiles, the guidance is applicable to C-CDA data templates and US Core FHIR profiles listed below.

	USCDI v1	C-CDA CDA Template	US Core FHIR Profile
P	Problems	Problem Observation	US Core Condition
A	Allergies and Intolerances	Allergy Intolerance Observation	US Core AllergyIntolerance
M	Medications	Medication Activity	US Core MedicationRequest
P	Procedures	Procedure Activity Procedure Procedure Activity Observation Procedure Activity Act	US Core Procedure
I	Immunization	Immunization Activity	US Core Immunization

Although explicit examples are not included to show mapping expectations for the CDA performer participation, mapping of the performer participation is pertinent to the following templates. Except for the guidance on how to apply context conduction, guidance on how to handle C-CDA author and

informant applies to performer as well. If the C-CDA entry includes a performer and the FHIR Resource being derived does not included a performer agent , this proposal recommends utalizing a [Resource].extension:performer_extension to support a semantically accurate and consistent mapping.

US CDI v1	C-CDA CDA Template	US Core FHIR Profile
Procedures	Procedure Activity Procedure	US Core Procedure
	Procedure Activity Observation	US Core Procedure
	Procedure Activity Act	US Core Procedure
Immunizations	Immunization Activity	US Core Immunization
Medications	Medication Activity	US Core MedicationRequest

Background

Implementers need to be familiar with the following information set forth in the HL7 CDA and FHIR standards when considering this proposed guidance.

About CDA Context Conduction

CDA context is set in the CDA header and applies to the entire document. Context can be overridden at the level of the section, and/or CDA entry. A document, in a sense, is a contextual wrapper for its contents. Assertions in the document header are typically applicable to statements made in the body of the document, unless overridden.

Contextual header components that have propagating values include:
- Author
- Confidentiality
- Data enterer
- Human language
- Informant
- Legal authenticator
- Participant
- Record target

Context components that can be overridden at the level of a document section include:
- Author
- Confidentiality
- Human language
- Informant
- Subject

Context components that can be overridden at the level of a CDA entry include:
- Author
- Confidentiality
- Human language
- Informant
- Participant
- Subject

See the base [CDA R2 specification](#) or the CDAR2_IG_CCDA_COMPANION_R2_STU_2019OCT.pdf from the [C-CDA Templates for Clinical Notes R2.1 Companion Guide, Release 2](#) for more information on CDA Context Conduction. Also see https://pubwiki.hl7.org/CDA_Design#Overview_of_CDA_Context.

The FiveWs Pattern

Who What When Where Why - Common pattern for all resources that deals with attribution.

- See [2.32 Pattern fivews – Content](#) for more information.
- Also see the FiveWs Pattern Mappings available on FHIR 'Mappings' tab of FHIR resource documentation. For example, the [FiveWs Pattern Mapping](#) for the FHIR Condition resource.

About CDA Participations and FHIR Resource Agents

The following definitions have been gathered from CDA R2.0 and C-CDA R2.1. FHIR Resource agent definitions come from FHIR R4, C-CDA on FHIR, and US Core.

Figure 1 CDA and FHIR: Compact Comparison

	Element/Attribute	Definitions	Definition Source
CDA	Problem Observation/**author**	A party that originates the Act and therefore has responsibility for the information given in the Act.	CDA R2
		The author element represents the creator of the clinical document. The author may be a device or a person.	C-CDA
FHIR	Condition.**recorder**	Who recorded the condition. Individual who recorded the record and takes responsibility for its content	US Core Condition Profile.**recorder**
	FiveWs.**author**	Who authored the content of the resource.	FiveWs Condition Mapping
CDA	Problem Observation/**informant**	A source of reported information (e.g., a next of kin who answers questions about the patient's history). For history questions, unless otherwise stated, the patient is implicitly the informant.	CDA R2
		The informant element describes an information source for any content within the clinical document. This informant is constrained for use when the source of information is an assigned health care provider for the patient.	C-CDA
FHIR	Condition.**asserter**	Individual who is making the condition statement.	US Core Condition Profile.**asserter**
	FiveWs.**source**	Who provided the information in this resource.	FiveWs Condition Mapping
CDA	Problem Observation/**performer**	A person who actually and principally carries out an action.	CDA R2
		The performer participant represents clinicians who actually and principally carry out the serviceEvent. In a transfer of care this represents the healthcare providers involved in the current or pertinent historical care of the patient. Preferably, the patient's key healthcare care team members would be listed, particularly their primary physician and any active consulting physicians, therapists, and counselors.	C-CDA
FHIR	Condition.extension:**performer_extension**	Represents clinicians who actually and principally carry out the clinical services being documented. In a transfer of care this represents the healthcare providers involved in the current or pertinent historical care of the patient. Preferably, the patients key healthcare care team members would be listed, particularly their primary physician and any active consulting physicians, therapists, and counselors.	CCDA on FHIR Performer (extension)
	FiveWs N/A	*Performer is a proposed extension to the base FHIR Condition resource. No FiveWs mapping of performer.*	

About C-CDA Templates for the Author Participation

CDA Participation Type	Relevant Definitions
Author Participation	[author: identifier urn:oid:2.16.840.1.113883.10.20.22.4.119 (open)] This template represents the Author Participation (including the author timestamp). CDA R2 requires that Author and Author timestamp be asserted in the document header. From there, authorship propagates to contained sections and contained entries, unless explicitly overridden. The Author Participation template was added to those templates in scope for analysis in R2. Although it is not explicitly stated in all templates the Author Participation template can be used in any template.
Provenance - Author Participation	[author: identifier urn:oid:2.16.840.1.113883.10.20.22.5.6:2019-10-01 (open)] This template represents the key information to record Provenance in an Author Participation. This Participation is appropriate to use at the CDA Header, CDA Section, or CDA Entry. This template is consistent with the C-CDA Author Participation template (2.16.840.1.113883.10.20.22.4.119), however, it doesn't use a formal 'conforms to' relationship. All constraints defined in this template simply specialize the existing Author Participation template. The assignedAuthor/id may be set equal to (a pointer to) an id on a participant elsewhere in the document (header or entries) or a new author participant can be described here.

About FHIR US Core Provenance Profile

StructureDefinition-us-core-provenance

This profile sets minimum expectations for the [Provenance](#) resource to record, search, and fetch Provenance information associated with a record. It identifies which core elements, extensions, vocabularies and value sets **SHALL** be present in the resource when using this profile. This FHIR Provenance profile here covers the minimal (basic) information to support lineage of information. Prior to reviewing this profile, implementers are encouraged to read the [Basic Provenance](#) guidance page which documents several key use cases.

Mandatory and Must Support Data Elements

The following data-elements are mandatory (i.e. data MUST be present) or must be supported if the data is present in the sending system (Must Support definition). They are presented below in a simple human-readable explanation. Profile specific guidance and examples are provided as well. The Formal Profile Definition below provides the formal summary, definitions, and terminology requirements.

Each Provenance must have:

resource(s) the Provenance record is supporting (target)

a date and time for the activity

Each Provenance must support:

an author responsible for the update

the author organization responsible for the information

the transmitter that provided the information

the transmitter organization responsible for the transmission (if the transmitter is a device the transmitter organization must also be valued).

Profile specific implementation guidance:

If a system receives a provider in Provenance.agent.who as free text they must capture who sent them the information as the organization. On request they **SHALL** provide this organization as the source and **MAY** include the free text provider.

About Provenance.agent

The Provenance resource must have at least one agent but may have more than one agent. The agent.who element must be populated and the type and onBehalfOf element may be populated. The agent information may conform to the pattern established for a ProvenanceAuthor or the pattern established for the ProvenanceTransmitter.

agent	S	1..*	(Slice Definition)	**Slice:** Unordered, Open by pattern:type
agent:All Slices				Content/Rules for all slices
type	S	0..1	CodeableConcept	**Binding:** US Core Provenance Participant Type Codes (extensible)
who	S	1..1	Reference(US Core Practitioner Profile | PractitionerRole | RelatedPerson | US Core Patient Profile | Device | US Core Organization Profile)	
onBehalfOf	S I	0..1	Reference(US Core Organization Profile)	**provenance-1:** onBehalfOf SHALL be present when Provenance.agent.who is a Practitioner or Device
agent:ProvenanceAuthor	S	0..*	BackboneElement	
type	S	1..1	CodeableConcept	**Required Pattern:** At least the following
coding		1..*	Coding	Code defined by a terminology system **Fixed Value:** (complex)
system		1..1	uri	Identity of the terminology system **Fixed Value:** http://terminology.hl7.org/CodeSystem/provenance-participant-type
code		1..1	code	Symbol in syntax defined by the system **Fixed Value:** author
agent:ProvenanceTransmitter	S	0..1	BackboneElement	
type	S	1..1	CodeableConcept	**Required Pattern:** At least the following
coding		1..*	Coding	Code defined by a terminology system **Fixed Value:** (complex)
system		1..1	uri	Identity of the terminology system **Fixed Value:** http://hl7.org/fhir/us/core/CodeSystem/us-core-provenance-participant-type
code		1..1	code	Symbol in syntax defined by the system **Fixed Value:** transmitter

Possible Values for agent.type

From code system http://hl7.org/fhir/us/core/CodeSystem/us-core-provenance-participant-type

Code	Definition
transmitter	The entity that provided the copy to your system.
enterer	A person entering the data into the originating system
performer	A person, animal, organization or device that who actually and principally carries out the activity
author	A party that originates the resource and therefore has responsibility for the information given in the resource and ownership of this resource
verifier	A person who verifies the correctness and appropriateness of activity
legal	The person authenticated the content and accepted legal responsibility for its content
attester	A verifier who attests to the accuracy of the resource

informant	A person who reported information that contributed to the resource
custodian	The entity that is accountable for maintaining a true an accurate copy of the original record
assembler	A device that operates independently of an author on custodian's algorithms for data extraction of existing information for purpose of generating a new artifact.
composer	A device used by an author to record new information, which may also be used by the author to select existing information for aggregation with newly recorded information for the purpose of generating a new artifact.