Pharmacy Health Information Technology Collaborative

Via Electronic Submission to: https://www.healthit.gov/standards-advisory/2016

November 6, 2016

Office of the National Coordinator
Department of Health and Human Services
Hubert H. Humphrey Bldg., Suite 729D
200 Independence Ave., SW
Washington, DC 20201

Re: 2016 Interoperability Standards Advisory

Dear Sir or Madam:

On behalf of the membership of the Pharmacy Health Information Technology Collaborative (Collaborative), we are pleased to submit comments regarding the proposed *2016 Interoperability Standards Advisory.*

The Collaborative has been involved with the federal agencies, including the Office of the National Coordinator (ONC), developing the national health information technology (HIT) framework since 2010. The Collaborative is supportive of the proposed standards for clinical health IT interoperability purposes.

Pharmacists provide patient-centered care and services, maintain various secure patient care records, and as part of the integrated health care team, they are directly involved with other health care providers and patients in various practice settings. Pharmacists are users of health IT and are especially supportive of interoperability standards incorporating HL7, SNOMED CT, LOINC, RxNorm, and NCPDP SCRIPT, and NCPDP Real Time Formulary and Benefits (currently under development). The Collaborative supports use of these particular standards which are important to pharmacists for allergy reactions, immunization historical and administered, immunization registry reporting, medications, medication allergies, patient problems, smoking status, reporting to public health agencies, clinical decision support services/knowledge artifacts, drug formulary checking, and electronic prescribing (including new versions).

As noted in our attached comments on the Interoperability Standards Advisory tables, it is vitally important that pharmacists' access to the proposed interoperability elements not be limited. Pharmacists, as health care providers need the ability to query documents within/outside a specific health information exchange domain and clinical health information, as well as medication and immunization sharing. Pharmacists need to know the indications on medications relating to ICD-10 and SNOMED-CT.

The following are our comments regarding two of the additional requests for feedback posed for the proposed *2016 Interoperability Standards Advisory*.

General

Request 4-1: *Please provide feedback on whether revision from "purpose" to "interoperability need" provides the additional requested context and suggestions for how to continue to improve this portion.*

The Collaborative supports the revisions from "purpose" to "interoperability need."

Section I: Vocabulary/Code Set/

Request 4-5: *Based on public feedback and HIT Standards Committee review, there does not appear to be a best available standard for several "interoperability needs" expressed in this section of the draft Advisory. Please provide feedback on whether this is correct or recommend a standard.*

The Collaborative supports the value sets of SNOMED-CT, RxNorm, and LOINC. Additional information regarding value sets for these three may be found at https://www.nlm.nih.gov/healthit/meaningful_use.html.

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The Pharmacy HIT Collaborative's vision and mission are to assure the nation's health care system is supported by meaningful use of HIT, the integration of pharmacists for the provision of quality patient care, and to advocate and educate key stakeholders regarding the meaningful use of HIT and the inclusion of pharmacists within a technology-enabled integrated health care system. The Collaborative was formed in the fall of 2010 by nine pharmacy professional associations, representing 250,000 members, and also includes associate members from other pharmacy-related organizations. The Pharmacy HIT Collaborative's founding organizations represent pharmacists in all patient care settings and other facets of pharmacy, including pharmacy education and pharmacy education accreditation. The Collaborative's Associate Members represent e-prescribing and health information networks, a standards development organization, transaction processing networks, pharmacy companies, system vendors and other organizations that support pharmacists' services. For additional information, visit www.pharmacyhit.org

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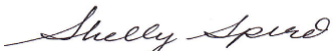
On behalf of the Pharmacy HIT Collaborative, thank you again for the opportunity to comment on the *2016 Interoperability Standards Advisory).*

For more information, contact Shelly Spiro, Executive Director, Pharmacy HIT Collaborative, at shelly@pharmacyhit.org.

Respectfully submitted,



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Section I: Best Available Vocabulary/Code Set/Terminology Standards and Implementation Specifications

I-A: Allergies

Interoperability Need: Representing patient allergic reactions

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	SNOMED-CT	Final	Production	●●●●○	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Pharmacy HIT Collaborative supports using SNOMED-CT for coding reactions, intolerances, and allergic severities.	• **No comment.**

Interoperability Need: Representing patient allergens: medications

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	RxNorm	Final	Production	●●●●○	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• When a medication allergy necessitates capture by medication class, NDF-RT is best available (as recommended by the HIT Standards Committee) • **COMMENT:** The Pharmacy HIT Collaborative supports using RxNorm for coding medication reactions, intolerances, and allergic severities	• **No comment.**

Interoperability Need: Representing patient allergens: food substances

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	SNOMED-CT	Final	Unknown	Unknown	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Pharmacy HIT Collaborative supports using	• **No comment.**

SNOMED-CT for coding reactions, intolerances, and allergic severities for food substances.	

Interoperability Need: Representing patient allergens: environmental substances

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	***[See Question 4-5]***						

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• Currently, there are no vocabulary code sets considered "best available" for environmental allergens. • **COMMENT:** The Pharmacy HIT Collaborative supports using SNOMED-CT for coding reactions, intolerances, and allergic severities for environmental substances.	• **No comment.**

I-B: Care Team Member

Interoperability Need: Representing care team member (health care provider)

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	National Provider Identifier (NPI)	Final	Production	●●○○○	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• For the purpose of recording a care team member, it should be noted that NPI permits, but does not require, non-billable care team members to apply for an NPI number to capture the concept of 'person'. • There is a SNOMED-CT value set for a "subjects role in the care setting" that could also be used in addition to NPI for care team members. • **COMMENT:** The Pharmacy HIT Collaborative supports using NPI board certification taxonomy for board for pharmacists. The	• **No comment.**

Collaborative would support the use SNOMED-CT value sets related NPI for care team members.	

I-C: Encounter Diagnosis

Interoperability Need: Documenting patient encounter diagnosis

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	SNOMED-CT	Final	Production	●●●●○	Yes	Free	N/A
Standard	ICD-10-CM	Final	Production	●●●●○	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using SNOMED-CT for problems related to ICD-10 encounter diagnosis. For pharmacists providing patient care services, it is important for the pharmacists to know the reason or indication for the medications being prescribed. ICD-10 documentation is used to validate the medication's appropriateness, including dosing, and the mitigation of adverse events. This information also improves a patients' understanding of the medications they're taking, which leads to increased medication adherence. Although ICD-10 codes may not necessarily match the indication for medication use, ICD-10 documentation for certain medications may be needed by certain payers (ICD-10 documentation is important for billing purposes). Linking the encounter diagnosis to a problem using SNOMED-CT codes is a better process of more accurate medication indication matching.	• **No comment.**

I-D: Race and Ethnicity

Interoperability Need: Representing patient race and ethnicity

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	OMB standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, Oct 30, 1997	Final	Production	●●●●●	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The CDC Race and Ethnicity Code Set Version 1.0, which expands upon the OMB standards may help to further define race and ethnicity for this interoperability need as it allows for multiple races and ethnicities to be chosen for the same patient. • The HIT Standards Committee noted that the high-level race/ethnicity categories in the OMB Standard may be suitable for statistical or epidemiologic purposes but may not be adequate in the pursuit of precision medicine and enhancing therapy or clinical decisions. • **COMMENT:** The Collaborative supports the OMB standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, Oct. 30, 1997.	• **No comment.**

I-E: Family Health History

Interoperability Need: Representing patient family health history

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	SNOMED-CT	Final	Production	●●●●○	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• Some details around family genomic health history may not be captured by SNOMED-CT (recommended by the HIT Standards Committee) • **COMMENT:** The Pharmacy HIT Collaborative supports using SNOMED-CT.	• **No comment.**

I-F: Functional Status/Disability

Interoperability Need: Representing patient functional status and/or disability							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	***[See Question 4-5]***						

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **No comment.**	• **No comment.**

I-G: Gender Identity, Sex, and Sexual Orientation

Interoperability Need: Representing patient gender identity							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	SNOMED-CT	Final	Unknown	Unknown	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The HIT Standards Committee recommended collecting discrete structured data on patient gender identity, sex, and sexual orientation following recommendations issued in a report by The Fenway Institute and the Institute of Medicine. • **COMMENT:** The Pharmacy HIT Collaborative supports using SNOMED-CT.	• **No comment.**

Interoperability Need: Representing patient sex (at birth)							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	For Male and Female, HL7 Version 3 Value Set for Administrative Gender	Final	Production	●●●●○	No	Free	N/A
Standard	For Unknown, HL7 Version 3 Null Flavor	Final	Production	●●●●○	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The HIT Standards Committee recommended collecting discrete structured data on patient gender identity, sex, and sexual orientation following recommendations issued in a report by The Fenway Institute and the Institute of Medicine. • **COMMENT:** The Collaborative supports the HIT Standards Committee recommendation.	• **No comment.**

Interoperability Need: Representing patient sexual orientation							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	SNOMED-CT	Final	Unknown	Unknown	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The HIT Standards Committee recommended collecting discrete structured data on patient gender identity, sex, and sexual orientation following recommendations issued in a report by The Fenway Institute and the Institute of Medicine. • **COMMENT:** The Pharmacy HIT Collaborative supports using SNOMED-CT	• **No comment.**

I-H: Immunizations

Interoperability Need: Representing immunizations – historical							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	HL7 Standard Code Set CVX—Clinical Vaccines Administered	Final	Production	●●●●●	Yes	Free	N/A
Standard	HL7 Standard Code Set MVX -Manufacturing Vaccine Formulation	Final	Production	●●●●○	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• HL7 CVX codes are designed to represent administered and historical immunizations and will not contain manufacturer-specific information. • When an MVX code is paired with a CVX (vaccine administered) code, the specific trade named vaccine may be indicated providing further specificity as to the vaccines administered. • **COMMENT:** The Collaborative supports immunization coding using MVX, CVX and NDC. For tracking purposes, it will be important to code the actual product, lot number, and expiration date.	• **No comment.**

Interoperability Need: Representing immunizations – administered							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	HL7 Standard Code Set CVX—Clinical Vaccines Administered	Final	Production	●●●●●	Yes	Free	N/A
Standard	National Drug Code	Final	Production	●●●●●	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• HL7 CVX codes are designed to represent administered and historical immunizations and will not contain manufacturer-specific information.	**No comment.**

• According to the HIT Standards Committee, National Drug (NDC) codes may provide value to stakeholders for inventory management, packaging, lot numbers, etc., but do not contain sufficient information to be used for documenting an administered immunization across organizational boundaries. • **COMMENT:** The Collaborative believes immunization coding should include MVX, CVX and NDC. For tracking purposes, it will be important to code the actual product, lot number and expiration date.	

I-I: Industry and Occupation

Interoperability Need: Representing patient industry and occupation

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	***[See Question 4-5]***						

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **No comment.**	• **No comment.**

I-J: Lab tests

Interoperability Need: Representing laboratory tests and observations

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	LOINC	Final	Production	●●●●○	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The HIT Standards Committee recommended that laboratory test and observation work in conjunction with values or results which can be answered numerically or	• **No comment.**

categorically. If the value/result/answer to a laboratory test and observation is categorical that answer should be represented with the SNOMED-CT terminology. • The HIT Standards Committee recommended that organizations not using LOINC codes should maintain and publish a mapping of their codes to the LOINC equivalent until migration to LOINC has occurred. • **COMMENT:** The Collaborative supports using LOINC and SNOMED-CT. The Collaborative supports the HIT committee recommendations.	

I-K: Medications

Interoperability Need: Representing patient medications							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	RxNorm	Final	Production	●●●●●	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using RxNorm for patient medications.	• **No comment.**

I-L: Numerical References & Values

Interoperability Need: Representing numerical references and values							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	The Unified Code of Units of Measure	Final	Production	●●●○○	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The case sensitive version is the correct unit string to be used for interoperability purposes per HIT Standards Committee recommendations.	• **No comment.**

• **COMMENT:** The Collaborative supports the HIT committee recommendations and request that the NCPD Dosing Designations. https://www.ncpdp.org/NCPDP/media/pdf/wp/DosingDesignations-OralLiquid-MedicationLabels.pdf	

I-M: Patient "problems" (i.e. conditions)

Interoperability Need: Representing patient "problems" (i.e., conditions)

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	SNOMED-CT	Final	Production	●●●●●	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using SNOMED-CT for patient problems for medication indications.	• **No comment.**

I-N: Preferred Language

Interoperability Need: Representing patient preferred language

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	RFC 5646	Final	Production	Unknown	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• RFC 5646 encompasses ISO 639-1, ISO 639-2, ISO 639-3 and other standards related to identifying preferred language.	• **No comment.**

I-O: Procedures

Interoperability Need: Representing dental procedures performed

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	Code on Dental Procedures and Nomenclature (CDT)	Final	Production	●●●●●	Yes	$	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• CDT is a proprietary terminology standard.	• **No comment.**

Interoperability Need: Representing medical procedures performed

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	SNOMED-CT	Final	Production	●●●●●	Yes	Free	N/A
Standard	the combination of CPT-4/HCPCS	Final	Production	●●●●●	Yes	$	N/A
Standard	ICD-10-PCS	Final	Production	●●●●○	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** THE Collaborative supports using SNOMED-CT, the combination of CPT-4/HCPCS, and ICD-10-PCS.	• **No comment.**

I-P: Radiology (interventions and procedures)

Interoperability Need: Representing radiological interventions and procedures

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	LOINC	Final	Production	●●○○○	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• Radlex and LOINC are currently in the process of creating a common data model to link the two standards together to promote standardized indexing of radiology terms as indicated by public comments and HIT Standards Committee recommendations.	• **No comment.**

I-Q: Smoking Status

Interoperability Need: Representing patient smoking status							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	SNOMED-CT	Final	Production	●●●●●	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• According to the HIT Standards Committee, there are limitations in SNOMED-CT for this interoperability need, which include not being able to capture severity of dependency, quit attempts, lifetime exposure, and use of e-Cigarettes. • **Comment:** The Collaborative supports using SNOMED-CT.	• **No comment.**

I-R: Unique Device Identification

Interoperability Need: Representing unique implantable device identifiers							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	Unique device identifier as defined by the Food and Drug Administration at 21 CFR 830.3	Final	Production	●○○○○	Yes	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **No comment.**	• **No comment.**

I-S: Vital Signs

Interoperability Need: Recording patient vital signs							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	LOINC	Final	Production	●●●●●	No	Free	N/A

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using LOINC for recording	•

patient vital signs.	

Section II: Best Available Content/Structure Standards and Implementation Specifications

II-A: Admission, Discharge, and Transfer

Interoperability Need: Sending a notification of a patient's admission, discharge and/or transfer status

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 2.x ADT message	Final	Production	●●●●●	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• Any HL7 2.x version messaging standard associated with ADT is acceptable. • A variety of transport protocols are available for use for ADT delivery. Trading partners will need to determine which transport tools best meet their interoperability needs. • **COMMENT:** The Collaborative supports using HL7 2.x version messaging standard.	• **No comment.**

II-B: Care Plan

Interoperability Need: Documenting patient care plans

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Clinical Document Architecture (CDA®), Release 2.0, Final Edition	Final	Production	●●●●●	No	Free	No

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Implementation Specification	HL7 Implementation Guide for CDA® Release 2: Consolidated CDA Templates for Clinical Notes (US Realm), Draft Standard for Trial Use, Release 2.1	Draft	Pilot	Unknown	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative recommends that consolidated CDA (C-CDA) Release 1.1 and 2.0 be included for the summary care record. For pharmacists providing patient care services, there have been joint NCPDP and HL7 standards development and implementation guides work using C-CDA Release 1.1 and current development work using C-CDA Release 2.1 for Pharmacist Care Plan.	• **No comment.**

II-C: Clinical Decision Support

Interoperability Need: Shareable clinical decision support

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Implementation Guide: Clinical Decision Support Knowledge Artifact Implementation Guide, Release 1.3, Draft Standard for Trial Use.	Draft	Pilot	Unknown	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports the use of HL 7 Implementation Guide: Clinical Decision Support Knowledge Artificial Implementation Guide, Release, 1.3, Draft Standard for Trial Use .	• **No comment.**

II-D: Drug Formulary & Benefits

Interoperability Need: The ability for pharmacy benefit payers to communicate formulary and benefit information to prescribers systems

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	NCPDP Formulary and Benefits v3.0	Final	Production	●●●●●	Yes	$	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The HIT Standards Committee noted that the NCPDP Real Time Prescription Benefit Inquiry (RTPBI) is an alternative in development that should be monitored as a potential emerging alternative. • **COMMENT:** The Collaborative supports the development of NCPDP Real Time formulary and benefit standard.	• **No comment.**

II-E: Electronic Prescribing

Interoperability Need: A prescriber's ability to create a new prescription to electronically send to a pharmacy

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	NCPDP SCRIPT Standard, Implementation Guide, Version 10.6	Final	Production	●●●●●	Yes	$	Yes

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The "New Prescription" transaction is best suited for this interoperability need. • Both the prescriber and the receiving pharmacy must have their systems configured for the transaction in order to facilitate successful exchange. • **COMMENT:** The Collaborative supports using NCPDP SCRIPT Standard, Implementation Guide, Version 10.6 and adoption of an updated version once approved by regulation.	• **No comment.**

Interoperability Need: Prescription refill request

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	NCPDP SCRIPT Standard, Implementation Guide, Version 10.6	Final	Production	●●●●○	No	$	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The "Refill Request" transaction is best suited for this interoperability need. • Both the prescriber and the receiving pharmacy must have their systems configured	• **No comment.**

for the transaction in order to facilitate successful exchange. • **COMMENT:** The Collaborative supports using NCPDP SCRIPT Standard, Implementation Guide, Version 10.6 and adoption of an updated version once approved by regulation.	

Interoperability Need: Cancellation of a prescription

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	NCPDP SCRIPT Standard, Implementation Guide, Version 10.6	Final	Production	Unknown	No	$	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The "Cancel" transaction is best suited for this interoperability need. • Both the prescriber and the receiving pharmacy must have their systems configured for the transaction in order to facilitate successful exchange. • **COMMENT:** The Collaborative supports using NCPDP SCRIPT Standard, Implementation Guide, Version 10.6 and adoption of an updated version once approved by regulation.	• **No comment.**

Interoperability Need: Pharmacy notifies prescriber of prescription fill status

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	NCPDP SCRIPT Standard, Implementation Guide, Version 10.6	Final	Production	Unknown	No	$	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The "Fill Status" transaction is best suited for this interoperability need. • Both the prescriber and the receiving pharmacy must have their systems configured for the transaction in order to facilitate successful exchange. • **COMMENT:** The Collaborative supports using NCPDP SCRIPT Standard, Implementation Guide, Version 10.6 and adoption of an	• **No comment.**

updated version once approved by regulation.	

Interoperability Need: A prescriber's ability to obtain a patient's medication history

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	NCPDP SCRIPT Standard, Implementation Guide, Version 10.6	Final	Production	●●●○○	No	$	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The "Medication History" transaction is best suited for this interoperability need. • Both the prescriber and the receiving pharmacy must have their systems configured for the transaction in order to facilitate successful exchange. • **COMMENT:** The Collaborative supports using NCPDP SCRIPT Standard, Implementation Guide, Version 10.6 and adoption of an updated version once approved by regulation.	• **No comment.**

II-F: Family health history (clinical genomics)

Interoperability Need: Representing family health history for clinical genomics

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Version 3 Standard: Clinical Genomics; Pedigree	Final	Production	●○○○○	Yes	Free	No
Implementation Specification	HL7 Version 3 Implementation Guide: Family History/Pedigree Interoperability, Release 1	Final	Production	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• According to the HIT Standards Committee, there is no available vocabulary to capture family genomic health history. • According to the HIT Standards Committee, further constraint of this standard and implementation specification may be required to support this interoperability need. • **COMMENT:** The Collaborative supports using both the HL7 Version 3 Standard: Clinical Genomics, Pedigree and the Implementation Guide: Family History/Pedigree Interoperability, Release 1.	• **No comment.**

II-G: Images

[See Question 4-7]

Interoperability Need: Medical image formats for data exchange and distribution							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	Digital Imaging and Communications in Medicine (DICOM)	Final	Production	●●●●●	No	Free	No
Implementation Specification	Image Acquisition Technology Specific Service/Object Pairs (SOP) Classes ***[See Question 4-8]***	Final	Production	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **No comment.**	• **No comment.**

Interoperability Need: Exchange of imaging reports							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	Digital Imaging and Communications in Medicine (DICOM)	Final	Production	●●●●●	No	Free	No
Implementation Specification	PS3.20 Digital Imaging and Communications in Medicine (DICOM) Standard – Part 20: Imaging Reports using HL7 Clinical Document Architecture.	Final	Production	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **No comment.**	• **No comment.**

II-H: Laboratory

Interoperability Need: Receive electronic laboratory test results							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 2.5.1	Final	Production	●●●●●	No	Free	No
Implementation Specification	HL7 Version 2.5.1 Implementation Guide: S&I Framework Lab Results Interface, Release 1—US Realm [HL7 Version 2.5.1: ORU_R01] Draft Standard for Trial Use, July 2012	Final	Production	●●●●○	Yes	Free	Yes
Emerging Alternative Implementation Specification	*HL7 Version 2.5.1 Implementation Guide: S&I Framework Laboratory Results Interface Implementation Guide, Release 1 DSTU Release 2 - US Realm* *[no hyperlink available yet]*	*Draft*	*Pilot*	●○○○○	*No*	*Free*	*No*

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• HL7 Laboratory US Realm Value Set Companion Guide, Release 1, September 2015, provides cross-implementation guide value set definitions and harmonized requirements. • **COMMENT:** The Collaborative supports using both the HL7 2.5.1 and the Implementation Guide; S &I Framework Lab Results Interface Release 1 – US Realm.	• **No comment.**

Interoperability Need: Ordering labs for a patient

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 2.5.1	Final	Production	●●●●●	No	Free	No
Implementation specification	HL7 Version 2.5.1 Implementation Guide: S&I Framework Laboratory Orders from EHR, Release 1 DSTU Release 2 - US Realm *[no hyperlink available yet]*	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• HL7 Laboratory US Realm Value Set Companion Guide, Release 1, September 2015, provides cross-implementation guide value set definitions and harmonized requirements.	• **No comment.**

• **COMMENT:** The Collaborative supports using HL7 Version 2.5.1.	

Interoperability Need: Support the transmission of a laboratory's directory of services to health IT.

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 2.5.1	Final	Production	●●●●●	No	Free	No
Standard	HL7 Version 2.5.1 Implementation Guide: S&I Framework Laboratory Test Compendium Framework, Release 2, DSTU Release 2 *[no hyperlink available yet]*	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• HL7 Laboratory US Realm Value Set Companion Guide, Release 1, September 2015, provides cross-implementation guide value set definitions and harmonized requirements. • **COMMENT:** The Collaborative supports using HL7 Version 2.5.1.	• **No comment.**

II-I: Patient Education Materials

Interoperability Need: A standard mechanism for clinical information systems to request context-specific clinical knowledge form online resources

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Version 3 Standard: Context Aware Knowledge Retrieval Application. ("Infobutton"), Knowledge Request, Release 2.	Final	Production	●●●●○	Yes	Free	No
Implementation Specification	HL7 Implementation Guide: Service-Oriented Architecture Implementations of the Context-aware Knowledge Retrieval (Infobutton) Domain, Release 1.	Final	Production	●●●○○	No	Free	No

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Implementation Specification	HL7 Version 3 Implementation Guide: Context-Aware Knowledge Retrieval (Infobutton), Release 4.	Final	Production	●●●○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using the three HL7 standards proposed.	• **No comment.**

II-J: Patient Preference/Consent

[See Question 4-9]

Interoperability Need: Recording patient preferences for electronic consent to access and/or share their health information with other care providers

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Implementation Specification	IHE Basic Patient Privacy Consents (BPPC)	Final	Production	●●●●○	No	Free	No
Implementation Specification	IHE Cross Enterprise User Authorization (XUA)	Final	Production	●●●●○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using IHE Basic Patient Privacy Consents and Cross Enterprise User Authorization.	• **No comment.**

II-K: Public Health Reporting

Interoperability Need: Reporting antimicrobial use and resistance information to public health agencies

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Clinical Document Architecture (CDA®), Release 2.0, Final Edition	Final	Production	●●●●●	No	Free	No

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Implementation Specification	HL7 Implementation Guide for CDA® Release 2 – Level 3: Healthcare Associated Infection Reports, Release 1, U.S. Realm.	Final	Production	●●○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• This is a national reporting system to CDC. Stakeholders should refer to implementation guide for additional details and contract information for enrolling in the program. • **COMMENT:** The Collaborative supports using HL7 CDA, Release 2.0, Final Edition and the Implementation Guide for CDA Release 2 – Level 3: Healthcare Association Infection Reports, Release 1, US Realm.	• **No comment.**

Interoperability Need: Reporting cancer cases to public health agencies

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Clinical Document Architecture (CDA®), Release 2.0, Final Edition	Final	Production	●●●●●	No	Free	No
Implementation Specification	HL7 Implementation Guide for CDA® Release 2: Reporting to Public Health Cancer Registries from Ambulatory Healthcare Providers, Release 1 - US Realm	Draft	Production	●●●○○	Yes	Free	Yes
Emerging Alternative Implementation Specification	*HL7 CDA ® Release 2 Implementation Guide: Reporting to Public Health Cancer Registries from Ambulatory Healthcare Providers, Release 1, DSTU Release 1.1 – US Realm*	*Draft*	*Pilot*	●○○○○	*No*	*Free*	*No*

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• Stakeholders should refer to the health department in their state or local jurisdiction to determine onboarding procedures, obtain a jurisdictional implementation guide if applicable, and determine which transport methods are acceptable for submitting cancer reporting data as there may be jurisdictional variation or requirements. • **COMMENT:** The Collaborative supports using HL7 CDA, Release 2.0,	• **No comment.**

Final Edition and the Implementation Guide for CDA Release 2 – Level 3: Healthcare Association Infection Reports, Release 1, US Realm.	

Interoperability Need: Case reporting to public health agencies

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
(1) Implementation Specification	IHE Quality, Research, and Public Health Technical Framework Supplement, Structured Data Capture, Trial Implementation, HL7 Consolidated CDA® Release 2.0	Draft	Pilot	●○○○○	No	Free	No
(2) Standard	Fast Healthcare Interoperability Resources (FHIR)	Draft	Pilot	●○○○○	No	Free	No
(2) Implementation Specification	Structured Data Capture Implementation Guide	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• Electronic case reporting is not wide spread and is determined at the state or local jurisdiction. • **COMMENT:** The Collaborative supports using HL7 Consolidated CDA Release 2.0; Fast Health Interoperability Resources (FHIR); and Structured Data Capture Implementation.	• **No comment.**

Interoperability Need: Electronic transmission of reportable lab results to public health agencies

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 2.5.1	Final	Production	●●●●●	Yes	Free	No
Implementation specification	HL7 Version 2.5.1: Implementation Guide: Electronic Laboratory Reporting to Public Health (US Realm), Release 1 with Errata and Clarifications and ELR 2.5.1 Clarification Document for EHR Technology Certification	Final	Production	●●●●●	Yes	Free	Yes

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Emerging Alternative Implementation Specification	*HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 2 (US Realm), Draft Standard for Trial Use, Release 1.1*	*Draft*	*Pilot*	*Unknown*	*No*	*Free*	*No*

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• Stakeholders should refer to the health department in their state or local jurisdiction to determine onboarding procedures, obtain a jurisdictional implementation guide if applicable, and determine which transport methods are acceptable for submitting ELR as there may be jurisdictional variation or requirements. • **COMMENT:** The Collaborative supports using HL7 Version 2.5.1; HL7 2.5.1: Implementation Guide: Electronic Laboratory Reporting to Public Health (US Realm) et al; and HL7 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 2 (US Realm), Draft Standard for Trial Use, Release 1.1.	• **No copy.**

Interoperability Need: Sending health care survey information to public health agencies

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Clinical Document Architecture (CDA®), Release 2.0, Final Edition	Final	Production	●●●●●	No	Free	No
Implementation Specification	HL7 Implementation Guide for CDA® R2: National Health Care Surveys (NHCS), Release 1 - US Realm ***[See Question 4-6]***	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• This is a national reporting system to CDC. Stakeholders should refer to the National Health Care Survey Program at: http://www.cdc.gov/nchs/nhcs/how_to_participate.htm for information on participation. • **COMMENT:** The Collaborative supports using HL7 CDA, Release 2.0, Final Edition and HL7 Implementation Guide for CDA R2: National Health Care Services, Release 1 – US Realm.	• **No comment.**

Interoperability Need: Reporting administered immunizations to immunization registry							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	HL7 2.5.1	Final	Production	●●●●●	Yes	Free	No
Implementation Specification	HL7 2.5.1 Implementation Guide for Immunization Messaging, Release 1.4	Final	Production	●●●●●	Yes	Free	Yes
Emerging Alternative Implementation Specification	*HL7 2.5.1 Implementation Guide for Immunization Messaging, Release 1.5*	*Final*	*Pilot*	●○○○○	*No*	*Free*	*No*

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• Stakeholders should refer to the health department in their state or local jurisdiction to determine onboarding procedures, obtain a jurisdictional implementation guide if applicable, and determine which transport methods are acceptable for submitting immunization registry data as there may be jurisdictional variation or requirements. • **COMMENT:** The Collaborative supports using HL7 Version 2.5.1; HL7 2.5.1 Implementation Guide for Immunization Messaging, Release 1.4 and 1.5.	• **No comment.**

Interoperability Need: Reporting syndromic surveillance to public health (emergency department, inpatient, and urgent care settings)							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	HL7 2.5.1	Final	Production	●●●●●	Yes	Free	No
Implementation Specification	PHIN Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data Release 1.1	Final	Production	●●●●○	Yes	Free	Yes

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Emerging Alternative Implementation Specification	*PHIN Messaging Guide for Syndromic Surveillance: Emergency Department, Urgent Care, Inpatient and Ambulatory Care Settings, Release 2.0*	*Final*	*Pilot*	●○○○○	*No*	*Free*	*No*

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• Stakeholders should refer to the health department in their state or local jurisdiction to determine onboarding procedures, obtain a jurisdictional implementation guide if applicable, and determine which transport methods are acceptable for submitting syndromic surveillance data as there may be jurisdictional variation or requirements. • **COMMENT:** The Collaborative supports using HL7 Version 2.5.1 and PHIN Messaging Guide for Syndromic Surveillance: Emergency Department and Urgent Care Data Release 1.1.	• **No comment.**

II-L: Quality Reporting

Interoperability Need: Reporting aggregate quality data to quality reporting initiatives

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Clinical Document Architecture (CDA®), Release 2.0, Final Edition	Final	Production	●●●●●	No	Free	No
Implementation Specification	HL7 Implementation Guide for CDA® Release 2: Quality Reporting Document Architecture - Category III (QRDA III), DRAFT Release 1	Draft	Production	●●●●○	Yes	Free	Yes

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using proposed HL7 CDA editions noted above.	• **No comment.**

Interoperability Need: Reporting patient-level quality data to quality reporting initiatives

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Clinical Document Architecture (CDA®), Release 2.0, Final Edition	Final	Production	●●●●●	No	Free	No

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Implementation Specification	HL7 Implementation Guide for CDA® Release 2: Quality Reporting Document Architecture – Category I, DSTU Release 2 (US Realm)	Draft	Production	●●●●○	Yes	Free	Yes
Emerging Alternative Implementation Specification	HL7 CDA® R2 Implementation Guide: Quality Reporting Document Architecture - Category I (QRDA I) DSTU Release 3 (US Realm)	Draft	Pilot	●○○○○	Yes	Free	Yes

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using proposed HL7 CDA editions noted above.	• **No comment.**

II-M: Representing clinical health information as a "resource"

Interoperability Need: Representing clinical health information as "resource"

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	Fast Healthcare Interoperability Resources (FHIR)	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using Fast Healthcare Interoperability Resources (FHIR).	• **No comment.**

II-N: Segmentation of sensitive information

Interoperability Need: Document-level segmentation of sensitive information

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Clinical Document Architecture (CDA®), Release 2.0, Final Edition	Final	Production	●●●●●	No	Free	No
Implementation Specification	Consolidated HL7 Implementation Guide: Data Segmentation for Privacy (DS4P), Release 1	Final	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:

• **COMMENT:** The Collaborative supports using HL7 CDA, Release 2.0, Final Edition and the Consolidated HL7 Implementation Guide: Data Segmentation for Privacy (DS4P), Release 1.	• **No comment.**

II-O: Summary care record

Interoperability Need: Support a transition of care or referral to another provider

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Clinical Document Architecture (CDA®), Release 2.0, Final Edition	Final	Production	●●●●●	No	Free	No
Implementation Specification	Consolidated CDA® Release 1.1 (HL7 Implementation Guide for CDA® Release 2: IHE Health Story Consolidation, DSTU Release 1.1 - US Realm)	Draft	Production	●●●●●	Yes	Free	Yes
Emerging Alternative Implementation Specification	*HL7 Implementation Guide for CDA® Release 2: Consolidated CDA Templates for Clinical Notes (US Realm), Draft Standard for Trial Use, Release 2.1*	*Draft*	*Pilot*	*Unknown*	*No*	*Free*	*No*

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• There are several specific document templates within the C-CDA implementation specification. Trading partners will need to ensure that their systems are capable of supporting specific document templates. • **COMMENT:** The Collaborative supports using HL7 Consolidated CDA Release 1.1 (HL7 Implementation Guide for CDA Release 2: IHE Health Story Consolidation, DSTU Release 1.1 – US Realm).	• **No comment.**

Section III: Best Available Standards and Implementation Specifications for Services

[See Question 4-10]

III-A: An unsolicited "push" of clinical health information to a known destination

[See Question 4-3]

Interoperability Need: An unsolicited "push" of clinical health information to a known destination between individuals							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	Applicability Statement for Secure Health Transport v1.1 ("Direct")	Final	Production	●●●●●	Yes	Free	Yes
Emerging Alternative Standard	*Applicability Statement for Secure Health Transport v1.2*	*Final*	*Pilot*	●○○○○	*No*	*Free*	*No*
Implementation Specification	XDR and XDM for Direct Messaging Specification	Final	Production	●●●●○	Yes	Free	Yes
Implementation Specification	IG for Direct Edge Protocols	Final	Production	●●○○○	Yes	Free	Yes
Implementation Specification	IG for Delivery Notification in Direct	Final	Production	●●●○○	No	Free	No
Emerging Alternative Standard	*Fast Healthcare Interoperability Resources (FHIR)*	*Draft*	*Pilot*	●○○○○	*No*	*Free*	*No*

Limitations, Dependencies, and Preconditions for Consideration:	**Applicable Security Patterns for Consideration:**
• "Direct" standard is based upon the underlying standard: Simple Mail Transfer Protocol (SMTP) RFC 5321 and for security uses Secure/Multipurpose Internet Mail Extensions (S/MIME) Version 3.2 Message Specification, RFC 5751. • For Direct, interoperability may be dependent on the establishment of "trust" between two parties and may vary based on the trust community(ies) to which parties belong. • **COMMENT:** The Collaborative supports using the standards proposed for "push" of clinical health information. The Collaborative strongly believes that it is vitally important to include	• **System Authentication** - The information and process necessary to authenticate the systems involved • **Recipient Encryption** - the message and health information are encrypted for the intended user • **Sender Signature** – details that are necessary to identity of the individual sending the message

pharmacists in this interoperability element.	

Interoperability Need: An unsolicited "push" of clinical health information to a known destination between systems

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	SOAP-Based Secure Transport Requirements Traceability Matrix (RTM) version 1.0 specification	Final	Production	●●●○○	Yes	Free	Yes
Implementation Specification	IHE-XDR (Cross-Enterprise Document Reliable Interchange)	Final	Production	●●●●○	No	Free	No
Implementation Specification	NwHIN Specification: Authorization Framework	Final	Production	●●●○○	No	Free	No
Implementation Specification	NwHIN Specification: Messaging Platform	Final	Production	●●●○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• The IHE-XDR implementation specification is based upon the underlying standards: SOAP v2, and OASIS ebXML Registry Services 3.0 • The NwHIN Specification: Authorization Framework implementation specification is based upon the underlying standards: SAML v1.2, XSPAv1.0, and WS-1.1. • **COMMENT:** The Collaborative supports using the standards proposed for "push" of clinical health information. The Collaborative strongly believes that it is vitally important to include pharmacists in this interoperability element.	• **System Authentication** - The information and process necessary to authenticate the systems involved • **Purpose of Use** - Identifies the purpose for the transaction • **Patient Consent Information** - Identifies the patient consent information that may be required before data can be accessed.

III-B: Clinical Decision Support Services

Interoperability Need: Providing patient-specific assessments and recommendations based on patient data for clinical decision support

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Version 3 Standard: Decision Support Service, Release 2.	Draft	Pilot	●○○○○	No	Free	No
Implementation Specification	HL7 Implementation Guide: Decision Support Service, Release 1.1, US Realm, Draft Standard for Trial Use	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using HL7 Version 3 Standard: Decision Support Service, Release 2 and the HL7 Implementation Guide.	• **No comment.**

Interoperability Need: Retrieval of contextually relevant, patient-specific knowledge resources from within clinical information systems to answer clinical questions raised by patients in the course of care

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Standard	HL7 Version 3 Standard: Context Aware Knowledge Retrieval Application. ("Infobutton"), Knowledge Request, Release 2.	Final	Production	●●●○○	Yes	Free	No
Implementation Specification	HL7 Implementation Guide: Service-Oriented Architecture Implementations of the Context-aware Knowledge Retrieval (Infobutton) Domain, Release 1.	Final	Production	●●●●○	No	Free	No
Implementation Specification	HL7 Version 3 Implementation Guide: Context-Aware Knowledge Retrieval (Infobutton), Release 4.	Final	Production	●●●●○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using HL7 Implementation Guide: Service-Oriented Architecture Implementations of the Context-aware Knowledge Retrieval (Infobutton) Domain, Release 1 and the HL7 Version 3 Implementation Guide (Infobutton), Release 4.	• **No comment.**

III-C: Image Exchange

Interoperability Need: Exchanging imaging documents among a group of affiliated entities							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Implementation Specification	IHE Cross Enterprise Document Sharing for Images (XDS-I)	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **No comment.**	• **No comment.**

III-D: Provider Directory

Interoperability Need: Listing of providers for access by potential exchange partners							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Implementation Specification	IHE IT Infrastructure Technical Framework Supplement, Healthcare Provider Directory (HPD), Trial Implementation	Draft	Pilot	●○○○○	No	Free	Yes

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using IHE IT Infrastructure Technical Framework Supplement, Healthcare Provider Directory, Trial Implementation.	• **No comment.**

III-E: Publish and Subscribe

Interoperability Need: Publish and subscribe message exchange

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Implementation Specification	NwHIN Specification: Health Information Event Messaging Production Specification	Final	Production	●●●○○	No	Free	No
Emerging Alternative Implementation Specification	*IHE Document Metadata Subscription (DSUB), Trial Implementation*	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using the above proposed NwHIN Specification and IHE Document Metadata Subscription.	• **No comment.**

III-F: Query

Interoperability Need: Query for documents within a specific health information exchange domain

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Implementation Specification	IHE-XDS (Cross-enterprise document sharing)	Final	Production	●●●●○	No	Free	No
Implementation Specification	IHE-PDQ (Patient Demographic Query)	Final	Production	●●●●○	No	Free	No
Implementation Specification	IHE-PIX (Patient Identifier Cross-Reference)	Final	Production	●●●●○	No	Free	No
Emerging Alternative Implementation Specification	*IHE – MHD (Mobile Access to Health Documents)*	*Draft*	*Pilot*	●○○○○	*No*	*Free*	*No*

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• IHE-PIX and IHE-PDQ are used for the purposes of patient matching and to	• **No comment.**

support this interoperability need. • **COMMENT:** The Collaborative supports using IHE-XDS, PDQ, and PIX.	

Interoperability Need: Query for documents outside a specific health information exchange domain

Type	Standard/Implementation Specification	Standards Process Maturity	Implementation Maturity	Adoption Level	Regulated	Cost	Test Tool Availability
Implementation Specifications	the combination of IHE-XCPD (Cross-Community Patient Discovery) and IHE-PIX (Patient Identifier Cross-Reference)	Final	Production	●●●●○	No	Free	No
Implementation Specification	NwHIN Specification: Patient Discovery	Final	Production	●●●○○	No	Free	No
Implementation Specifications	IHE-XCA (Cross-Community Access) further constrained by eHealth Exchange Query for Documents v 3.0	Final	Production	●●●●○	No	Free	No
Implementation Specification	NwHIN Specification: Query for Documents	Final	Production	●●●○○	No	Free	No
Implementation Specification	NwHIN Specification: Retrieve Documents	Final	Production	●●●○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• IHE-PIX and IHE-XCPD are used for the purposes of patient matching and to support this interoperability need.	• **System Authentication** - The information and process necessary to authenticate the systems involved • **User Details** - identifies the end user who is accessing the data • **User Role** - identifies the role asserted by the individual initiating the transaction • **Purpose of Use** - Identifies the purpose for the transaction • **Patient Consent Information** - Identifies the patient consent information that may be required before data can be accessed. • **Query Request ID** - Query requesting application assigns a unique identifier for each query request in order to match the response to the original query.

Interoperability Need: Data element based query for clinical health information							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Standard	Fast Healthcare Interoperability Resources (FHIR)	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using all of the above-proposed standards for this interoperability element, and especially FHIR when it becomes available. The Collaborative also strongly believes it is important for pharmacists, as providers, should have access to queries for clinical information. They should not to be limited or excluded from queries.	• **System Authentication** - The information and process necessary to authenticate the systems involved • **User Details** - identifies the end user who is accessing the data • **User Role** - identifies the role asserted by the individual initiating the transaction • **Purpose of Use** - Identifies the purpose for the transaction • **Patient Consent Information** - Identifies the patient consent information that may be required before data can be accessed. • **Query Request ID** - Query requesting application assigns a unique identifier for each query request in order to match the response to the original query.

III-G: Resource Location

Interoperability Need: Resource location within the US							
Type	**Standard/Implementation Specification**	**Standards Process Maturity**	**Implementation Maturity**	**Adoption Level**	**Regulated**	**Cost**	**Test Tool Availability**
Implementation Specification	IHE IT Infrastructure Technical Framework Supplement, Care Services Discovery (CSD), Trial Implementation	Draft	Pilot	●○○○○	No	Free	No

Limitations, Dependencies, and Preconditions for Consideration:	Applicable Security Patterns for Consideration:
• **COMMENT:** The Collaborative supports using IHE IT Infrastructure Technical Framework Supplement, Care Services Discovery, Trial Implementation.	• **No comment.**