NYeC

New York eHealth  
Collaborative

CCD and IHE Reference  
*for the*  
*SHIN-NY API Hack-a-thon*

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# Executive Summary

This Continuity of Care Document (CCD) and Integrating the Healthcare Enterprise (IHE) reference document is written to help the SHIN-NY Hackathon developers understand how clinical data is stored in a CCD and communicated via IHE for Health Information Exchange (HIE).

The CCD standard has resulted from the combination of the CCR (Continuity of Care Record[[1]](#footnote-1)), which is created by the ASTM (American Society for the Testing of Materials) and the CDA (Clinical Document Architecture), which is created by HL7.

* The CCR describes the data that should be included in the patient’s clinical record as it moves from one place to another, however, the CCR does not define the architecture of the data.
* The CDA provides the architectural structure of the data.

Together, the CCR and the CDA can provide both the required data and an architectural solution. By combining the CCR with the CDA, the CCD attempts to provide an object-oriented model for creating clinical documentation.

This document provides the SHIN-NY perspective about how a CCD should be used based within our system capabilities. We hope this document serves as the foundation for future communication using the IHE standard with the SHIN-NY.

## Clinical Document Architecture (CDA)

A CDA is an HL7 document markup standard that specifies both the structure and semantics of “clinical documents” for the purpose of exchanging clinical data. Also see *Clinical Document Architecture (CDA)* in the *Glossary* on page 6.

### Supported CDA Content Modules: Sections

The CDA Content Module Sections that are supported (✓) by SHIN-NY are listed in *Table 1*.

Table 1. NYeC Supported Content Module Sections

| Section | Export | Section | Export |
| --- | --- | --- | --- |
| Advance Directives | **✓** | Hospital Discharge Medications | **✓** |
| Allergies and Other Adverse Reactions | **✓** | Immunizations | **✓** |
| Demographics | **✓** | Medications | **✓** |
| Diagnostic Result | **✓** | Medications Administered | **✓** |
| Discharge Diagnosis | **✓** | Non-ratified Sections | **✓** |
| Encounters | **✓** | Plan of Care | **✓** |
| Family History | **✓** | Problems List | **✓** |
| History of Past Illness | **✓** | Procedures and Interventions | **✓** |
| History of Present Illness | **✓** | Reason for Referral | **✓** |
| Hospital Admission Diagnosis | **✓** | Social History | **✓** |
| Hospital Course | **✓** | Vital Signs | **✓** |

### Supported CDA Content Modules: Entries

The CDA Content Module Entries that are supported (✓) by SHIN-NY are listed in *Table 2*

Table 2. NYeC Supported Content Module Entries

| Entry | Export | Entry | Export |
| --- | --- | --- | --- |
| Advance Directive | **✓** | Medication | **✓** |
| Allergy and Drug Sensitivity | **✓** | Personal Information | **✓** |
| Comment | **✓** | Plan of Care | **✓** |
| Encounter | **✓** | Procedure | **✓** |
| Family History | **✓** | Result | **✓** |
| Healthcare Provider | **✓** | Social History | **✓** |
| Immunization | **✓** | Support | **✓** |
| Information Source | **✓** | Vital Sign | **✓** |
| Language Spoken | **✓** |  | |

## Continuity of Care Document (CCD)

A CCD is an example of one type of CDA document. The CCD describes constraints on the HL7 CDA Release 2 specification in accordance with requirements set forward in the ASTM E2369-05 Standard Specification for the CCR. Also see *Continuity of Care Document (CCD)* in the *Glossary* on page 6.

## Continuity of Care Record (CCR)

The Continuity of Care Record1 (CCR) is a core data set of the most relevant administrative, demographic, and clinical information facts about a patient’s healthcare, covering one or more healthcare encounters.   
Also see *Continuity of Care Record (CCR)* in the *Glossary* on page 6.

## HITSP CDA Content Modules (C83 ver2.0)

HITSP[[2]](#footnote-2) (C83) describes a library of sections that can be combined into various CDA document types.   
Also see *HITSP CDA Content Modules (C83 ver2.0)* in the *Glossary* on page 6.

## HITSP Clinical Document and Message Terminology Component (C80)

The Clinical Document and Message Terminology Component defines the vocabularies and terminologies used by HITSP specifications for Clinical Components and Messages that support the interoperable transmission of information.   
Also see *HITSP Clinical Document and Message Terminology Component (C80)* in the *Glossary* on page 6.

## HITSP Data Dictionary (C154)

The HITSP Data Dictionary defines the library of Data Elements that may be used by HITSP constructs in standards based exchanges. Also see *HITSP Data Dictionary (C154)* in the *Glossary* on page 7.

## HITSP (C32 ver2.5)

The HITSP Summary Document using HL7 CCD Component 32 describes the document content summarizing a consumer’s medical status for the purpose of information exchange.   
Also see *HITSP (C32 ver2.5)* in the *Glossary* on page 7.

## XPaths to CCD Sections

Below is a selection of relevant XPaths that you can use to parse specific sections of a CCD.   
**Note:** **Boldface** entries are supported for the Hack-a-thon.

Table 3. XPaths to Relevant CCD Sections

| CCD Section | Template ID | /ClinicalDocument/component/structuredBody/component/section |
| --- | --- | --- |
| **Advance Directives** | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.116’] |
| **Allergies and Other Adverse Reactions** | C83 | [templateId/@root=’2.16.840.1.113883.3.88.11.83.102’] |
| **Diagnostic Result** | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.122’] |
| **Encounters** | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.127’] |
| **Medications** | C83 | [templateId/@root='2.16.840.1.113883.3.88.11.83.112'] |
| IHE-PCC | [templateId/@root='1.3.6.1.4.1.19376.1.5.3.1.3.19'] |
| HL7 | [templateId/@root='2.16.840.1.113883.10.20.1.8'] |
| **Vital Signs** | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.119’] |
| Discharge Diagnosis | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.111’] |
| Family History | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.125’] |
| History of Past Illness | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.104’] |
| History of Present Illness | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.107’] |
| Hospital Admission Diagnosis | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.110’] |
| Hospital Course | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.121’] |
| Hospital Discharge Medications | C83 | [templateId/@root=’2.16.840.1.113883.3.88.11.83.114’] |
| Immunizations | C83 | [templateId/@root=’2.16.840.1.113883.3.88.11.83.117’] |
| Medications Administered | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.115’] |
| Plan of Care | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.124’] |
| Problems List | C83 | [templateId/@root='2.16.840.1.113883.3.88.11.83.103'] |
| IHE-PCC | [templateId/@root='1.3.6.1.4.1.19376.1.5.3.1.3.6'] |
| HL7 | [templateId/@root='2.16.840.1.113883.10.20.1.11'] |
| Reason for Referral | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.106’] |
| Social History | C83 | [templateId/@root=’ 2.16.840.1.113883.3.88.11.83.126’] |

# Glossary

## Clinical Document Architecture (CDA)

A CDA is an HL7 document markup standard that specifies both the structure and semantics of “clinical documents” for the purpose of exchanging clinical data. CDA documents derive their machine-processable meaning from the HL7 Reference Information Model (RIM) and use the HL7 version 3 data types. CDA is a flexible, XML-based, clinical document architecture. While CDA, itself, is not one specific document, it can be used to express many types of clinical documents based on different use cases, such as:

* **Discharge Summary**, (i.e., HITSP C48)
* **History and Physical** (i.e., HITSP C84)
* **Lab Report** (i.e., HITSP C37).

A CDA document can contain many data sections. Each section can contain both narrative text and, also, possibly some coding which may be used to describe clinical data in shorthand notation. The CDA specification section of this document highlights the detailed:

* Capabilities of the sections of the CDA that we currently support
* “Quirks” that we prefer to implement to make the transmission of data easier and more valuable.

## Continuity of Care Document (CCD)

A CCD is an example of one type of CDA document. The CCD describes constraints on the HL7 CDA Release 2 specification in accordance with requirements set forward in the ASTM E2369-05 Standard Specification for the Continuity of Care Record (CCR). It is intended as an alternate implementation to the one specified in ASTM ADJE2369 for those institutions or organizations committed to implementation of the HL7 Clinical Document Architecture.

The underlying software code generates a CCD that follows a structure comprising a header segment and a body segment. The header and body segments are populated with data that pertains to a specific use case. Within the provisioning of healthcare, there are many possible use cases, (e.g., admission, discharge, transfer of care, etc.). Each use case has its own set of content module sections and entries that are drawn from the HITSP/C32 standards.

## Continuity of Care Record (CCR)

The Continuity of Care Record1 (CCR) is a core data set of the most relevant administrative, demographic, and clinical information facts about a patient’s healthcare, covering one or more healthcare encounters. It provides a means for one healthcare practitioner, system, or setting to aggregate all of the pertinent data about a patient and forward it to another practitioner, system, or setting to support the continuity of patient care. Other types of CDA documents can contain some of the same CCD sections as well as different CCD sections.

## HITSP CDA Content Modules (C83 ver2.0)

HITSP[[3]](#footnote-3) (C83) describes a library of sections that can be combined into various CDA document types. In addition, a document type can include additional sections, even those that are not a part of it. For example, a CCD could add a section entitled Reason for Referral and it would continue to be a valid CCD.

In addition, sections in C83 can contain structured data described as Entry Content Modules that are being assembled into a HITSP Data Dictionary that describes the data elements and their constraints, (i.e., optionality, repeatability, and value sets), for each data element.

## HITSP Clinical Document and Message Terminology Component (C80)

The Clinical Document and Message Terminology Component defines the vocabularies and terminologies used by HITSP specifications for Clinical Components and Messages that support the interoperable transmission of information. C80 defines vocabularies that have been constrained by other HITSP constructs but does not define all the vocabulary choices made by the various SDO Implementation Guides, profiles, etc. HITSP may, however, state further constraints to limit optionality and these constraints may be stated in other HITSP constructs. For this reason, HITSP/C80 Clinical Document and Message Terminology component is not self-supporting. Its use always is enabled by other HITSP constructs, most notably the HITSP/C83 CDA Content Modules.

## HITSP Data Dictionary (C154)

The HITSP Data Dictionary defines the library of Data Elements that may be used by HITSP constructs in standards based exchanges. To simplify navigation, the Data Elements are organized into modules, such as Medications, Advance Directives, Immunizations, etc.

## HITSP (C32 ver2.5)

The HITSP Summary Document using HL7 CCD Component 32 describes the document content summarizing a consumer’s medical status for the purpose of information exchange. The content may include both administrative information, (e.g., registration, demographics, insurance, etc.), and clinical information, (e.g., problem list, medication list, allergies, test results, etc.).

Any specific use of Component 32 by another HITSP specification may further constrain the content based upon the requirements and context of the document exchange. This specification defines content in order to promote interoperability between participating systems. Any given system either creating or consuming the document may contain much more information than is conveyed by this specification. Such systems may include:

* Personal Health Records (PHRs)
* Electronic Health Records (EHRs)
* Practice Management Applications
* Other persons and systems as identified and permitted.

The C32 use case includes 17 sections that pertain to the transfer of care of patient. The C32 use case contains all of the data that is required for the needs of the NYeC Health Information eXchange.

NYeC appreciates that the HITSP C32 patient summary document may be interpreted in multiple ways and, to that end, we support the CCD both as a:

* Patient summary document
* Transport protocol for a transaction messaging system.

## Medical Record Number (MRN)

The Medical Record Number (MRN) is a unique ID by which a healthcare facility identifies a patient.

When a new patient arrives for an encounter at a facility, an MRN is created for that patient. Thereafter, that facility attaches the patient's MRN to all electronic messages that are sent pertaining to the care of that patient.

When NYeC receives a new MRN in a message from a healthcare facility, it adds that MRN to its database together with additional parameters describing the patient. If the same MRN arrives in another message from the same facility, NYeC can immediately identify the patient and add the incoming data to its database. If NYeC receives a subsequent message containing new information for the same patient but with a different MRN from a different facility, NYeC can employ powerful logic to determine whether the incoming data pertains to the same named patient. If there is a positive match, NYeC adds the second MRN to its database and maps both MRNs to the same patient. In that way, NYeC enhances its database with a list of the different MRNs that identify a single patient.

Consider what can happen when multiple healthcare providers are grouped within a single healthcare facility. In this case, each provider can maintain its own database with its own system of unique MRNs to identify patient data. Thus, a patient with encounters at multiple providers within a single facility can have a different MRN for each provider. To simplify the processing of electronic messages for its patients, such a facility can map a patient's different MRNs to a single identification code or master identifier. For example, when a provider within that group sends an electronic message to NYeC, rather than send the provider's MRN for that patient, the system looks up the MRN and replaces it with the patient's master identifier. Then, the message is dispatched to NYeC. NYeC interprets the master identifier as though it were just another MRN.

## Enterprise Master Patient Index (EMPI) Identifier

NYeC continuously receives patient-related electronic messages from many different healthcare facilities and must link the MRN on each incoming message to the proper patient in the NYeC database. Ideally, a patient should have one identifier across all of the health facilities. NYeC achieves this goal by creating a single master identifier, EMPI, for each patient and by linking all of the different MRNs for that patient to one EMPI in the NYeC database.

1. CCR is not currently supported by NYeC Healthix. [↑](#footnote-ref-1)
2. Health Information Technology Standards Pool [↑](#footnote-ref-2)
3. Health Information Technology Standards Pool [↑](#footnote-ref-3)