What is The Clinical Document Architecture – Release 2 (CDA R2)
Presenters

Russell Hamm
Lantana Consulting Group
russ.hamm@lantanagroup.com

Durwin Day
Health Care Service Corporation
DAYD@BCBSIL.COM

Erik Pupo
Specialist Leader | Federal Health Deloitte Consulting LLP
erpupo@deloitte.com
Objectives of this Session

● What is the Clinical Document Architecture (CDA)?
  ─ The characteristics of a CDA document.
  ─ What is human readable vs. computable data?
  ─ What is the Consolidated CDA and what does it look like?

● The Structure of CDA / Templated CDA

● Examples
  ─ Sending data
What is CDA R2?

- A specification for exchange of clinical documents, defining their structure and semantics

- ANSI standard developed by HL7’s Structured Documents Work Group (SDWG)

- CDA Release 1 became an HL7 and ANSI standard in 2000.

  - Release 2 (R2) is the current version of the standard.
The CDA Refined Message Information Model (RMIM)

- As an HL7 V3 standard, CDA makes use of the HL7 Reference Information Model (RIM).
- The HL7 RIM is a generic information model expressed using Unified Modeling Language (UML) that covers healthcare as a whole.
- CDA restricts the HL7 RIM for clinical document exchange—this is known as the CDA RMIM.
The CDA

- A technical standard for authoring several types of clinical documents in a format that can easily be exchanged between organizations
- CDA defines the structure and semantics of clinical documents using:
  - Extensible Markup Language (XML)
  - HL7 Reference Information Model (RIM)
  - Controlled vocabularies (SNOMED, LOINC, CPT, HL7, etc.)
  - Designed to create documents that are both Human Readable and Machine Interpretable

```xml
  <section>
    <code code="11348-0" codeSystem="2.16.840.1.113883.6.1"
      codeSystemName="LOINC" displayNome="HISTORY OF PAST ILLNESS" />
    <title>Antécédents médicaux</title>
    <text>
      <table border="1">
        <tbody>
          <tr>
            <th>Pathologie</th>
          </tr>
        </tbody>
      </table>
    </text>
  </section>
```
Good Health Clinic Consultation Note

Patient: Henry Levin, the 7th
Birthdate: September 24, 1932
Consultant: Downey Gordon, MD

History of Present Illness

Henry Levin, the 7th is a 67 year old male referred for evaluation of asthma in his teens. He was hospitalized twice last year and has been able to be weaned off steroids for the past several months.

Past Medical History

- Asthma
- Hypertension (see HTN.cda for details)
- Osteoarthritis, right knee

Medications

- Theodur 200mg BID
- Proventil inhaler 2 puffs QID PRN
- Prednisone 20mg ad
Characteristics of a CDA Document

- A CDA document has the following characteristics:
  
  - **Persistence**: CDA documents continue to live in an unaltered state, for a time period defined by local and regulatory requirements.
  
  - **Stewardship**: CDA documents are maintained by an organization entrusted with its care.
  
  - **Potential for authentication**: CDA documents are able to record or attest to the signature of a responsible party.
  
  - **Context**: CDA documents detail the setting for event(s) described in the document so that it can be fully understood and assessed.
  
  - **Wholeness**: CDA documents, as a whole, tell a complete story.
  
  - **Human readability**: CDA documents must be able to be read by a human
Primary Use Cases for CDA Documents

- **Access / portability / exchange**
  - Query / locate by patient, provider, practitioner, setting, encounter, date
  - Access distributed information through common metadata
  - Document management

- **Integration**
  - Transcription systems
  - Electronic health records

- **Reuse / derivative data**
  - Summaries, reports
  - Decision support
<table>
<thead>
<tr>
<th>Section</th>
<th>(entries optional)</th>
<th>(entries required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance Directives Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allergies Section</td>
<td>(entries optional)</td>
<td>(entries required)</td>
</tr>
<tr>
<td>Anesthesia Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chief Complaint and Reason for Visit Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chief Complaint Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complications Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DICOM Object Catalog Section - DCM 121181</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge Diet Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encounters Section</td>
<td>(entries optional)</td>
<td>(entries required)</td>
</tr>
<tr>
<td>Family History Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fetus Subject Context</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Findings Section (DIR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional Status Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Status Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of Past Illness Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of Present Illness Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Admission Diagnosis Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Admission Medications Section</td>
<td>(entries optional)</td>
<td></td>
</tr>
<tr>
<td>Hospital Consultations Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Course Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Discharge Diagnosis Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Discharge Instructions Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Discharge Medications Section</td>
<td>(entries optional)</td>
<td>(entries required)</td>
</tr>
<tr>
<td>Hospital Discharge Physical Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Discharge Studies Summary Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immunizations Section</td>
<td>(entries optional)</td>
<td>(entries required)</td>
</tr>
<tr>
<td>Implants Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructions Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interventions Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical (General) History Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section Entries</td>
<td>Section Entries</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>Admission Medication</td>
<td>Health Status Observation</td>
<td></td>
</tr>
<tr>
<td>Advance Directive Observation</td>
<td>Hospital Admission Diagnosis</td>
<td></td>
</tr>
<tr>
<td>Age Observation</td>
<td>Hospital Discharge Diagnosis</td>
<td></td>
</tr>
<tr>
<td>Allergy Observation</td>
<td>Immunization Activity</td>
<td></td>
</tr>
<tr>
<td>Allergy Problem Act</td>
<td>Immunization Medication</td>
<td></td>
</tr>
<tr>
<td>Allergy Status Observation</td>
<td>Immunization Refusal Reason</td>
<td></td>
</tr>
<tr>
<td>Boundary Observation</td>
<td>Indication</td>
<td></td>
</tr>
<tr>
<td>Code Observations</td>
<td>Instructions</td>
<td></td>
</tr>
<tr>
<td>Comment Activity</td>
<td>Medication Activity</td>
<td></td>
</tr>
<tr>
<td>Coverage Activity</td>
<td>Medication Dispense</td>
<td></td>
</tr>
<tr>
<td>Discharge Medication</td>
<td>Medication Information</td>
<td></td>
</tr>
<tr>
<td>Drug Vehicle</td>
<td>Medication Supply Order</td>
<td></td>
</tr>
<tr>
<td>Encounter Activities</td>
<td>Medication Use - None Known</td>
<td></td>
</tr>
<tr>
<td>Estimated Date of Delivery</td>
<td>Non-Medicinal Supply Activity</td>
<td></td>
</tr>
<tr>
<td>Family History Death</td>
<td>Plan of Care Activity Act</td>
<td></td>
</tr>
<tr>
<td>Family History Organizer</td>
<td>Plan of Care Activity</td>
<td></td>
</tr>
<tr>
<td>Family History Observation</td>
<td>Encounter</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Code Systems

### Standard Code Systems
- LOINC
- SNOMED
- ICD-9/10
- RxNorm
- NUCC Health Care Provider Taxonomy
- ICD9 CM Procedures
- CPT-4
- Confidentiality Code
- National Cancer Institute (NCI) Thesaurus
- US Postal Codes

### HL7 Value Sets
- Administrative Gender
- ActMood
- Religious Affiliation
- RoleClass
- RoleCode
- AddressUse
- ActStatus
- MaritalStatus
CDA can be simple or complex

- Simple encoding relatively inexpensive
- Complex encoding costs more

- You get what you pay for
  - The more detailed the encoding
  - The greater the potential for reuse
Consolidated CDA

A single source that defines the implementation of the following CDA documents:

- CCD
- Consultation Note
- Diagnostic Imaging Report
- Discharge Summary
- H&P
- Operative Note
- Procedure Note
- Progress Note
- Unstructured Document

- Cited in Meaningful Use Stage 2
Why the Consolidated CDA?

- Consolidated CDA is easier to implement
  - **Single reference** standard to work from, instead of many complex cross-references.
  - In development of a single reference, **inconsistencies** and **ambiguities** across cross-references have been resolved.

- Consolidated CDA requires more consistent and robust information
  - The C-CDA CCD requires inclusion of at least **4 clinical domains** (allergies, medications, problems, results)
    - C32 only required document demographics
  - C-CDA **requires the use of vocabularies** for much of it’s clinical data

- Consolidated CDA enables the ease of exchange other documents
  - **Modular template design** makes exchanging structured versions of additional clinical documents (e.g., high value notes) incrementally easier.
    - Example: History & Physical template shares 9 of its 19 clinical domain templates with the CCD
Every CDA Document is composed of two parts:

- **Header**
  - Contains information about the document, establishes context for the details found in the Body:
    - Who: Participants such as patient, physician, author...
    - What: Document Title, encompassing encounter...
    - Where: Location
    - When: Creation date
    - And much more...

- **Body**
  - Contains clinically relevant information
The CDA document begins like any other introduction—by identifying itself

- **id**: a globally unique identifier for the document
- **code**: specifies the document type
- **title**: descriptive heading or caption
- **effectiveTime**: when the document was created
- **confidentialityCode**: level of confidentiality for the document
- **languageCode**: language for the document text
- **setId** and **versionNumber**: used for document versioning

The setId refers to the same document and the versionNumber identifies the latest (newer) copy of the document.
The CDA Header includes a list of participants (who’s who)

- **recordTarget**: who the document is about (the patient)
- **author**: who or what (device) created the document
- **dataEnterer**: who entered the data into the document
- **informant**: any person who provided information about the patient
- **custodian**: organization charged with maintaining the document
- **informationRecipient**: who is intended to receive the document
- **authenticator**: person who attests to the accuracy of the document
- **legalAuthenticator**: person who is legally responsible for the document content
- **participant**: generic participant that can be used if not described elsewhere
The CDA Header describes the setting for the document as a service event, such as a procedure, and the encounter

- `componentOf/encompassingEncounter`: encounter framing the document and/or service described within
  - Only one encounter can be expressed in a document—this gives the document a single purpose or reason for existence
  - Describes encounter participants, responsible party, location of healthcare facility
- `documentationOf/serviceEvent`: the service being documented
  - Associates the document with an act (e.g., colonoscopy, ultrasound) and identifies the practitioners
Examples of How the CDA Header Is Used

- **Indexing of records**
  - The CDA Header can be used to quickly index CDA records.
  - Contains the document title, author, participants, location, and service event.

- **Longitudinal patient lookup**
  - The CDA Header contains the demographic information for a patient and forms the foundation of longitudinal (repeated observations on the same subject) patient lookup.

- **Version control systems**
  - `versionNumber` and `setId` can be used by document management systems to track versions of a document.
  - Note that CDA documents are immutable, so any changes are published in a new version of the document.
● Contains clinical information
● Every CDA document contains exactly one Body
● The CDA Body can be structured (structuredBody) or unstructured (nonXMLBody)
The nonXMLBody

- A nonXMLBody can be any supported format:
  - Text- PDF, Microsoft Word, HTML, rich text, plain text
  - Images- GIF, JPEG, PNG, TIFF

- The nonXMLBody can point to an external file that should be used
  - The external file should be delivered with the CDA Document or placed in a location that is accessible to the receiver

- The nonXMLBody can link to and decode embedded base-64 encoded content

- The Header of the CDA document with a nonXMLBody can be displayed using an XSLT stylesheet and most browsers can display a number of the supported formats
  - Browsers may need to be configured to handle certain formats, such as PDF, Microsoft Word, rich text, and TIFF
nonXMLBody Example – External Reference

- Body starts with the component element
- Wrapped by nonXMLBody
- Text element specifies the MIME type
- Reference is a link to the document (PDF, JPG, etc.) being included

```
<component>
    <nonXMLBody>
        <text mediaType="application/pdf">
            <reference value="discharge-summary.pdf"/>
        </text>
    </nonXMLBody>
</component>
```
The structuredBody

- A structuredBody follows markup rules for narrative text and CDA (similar to HTML)

- structuredBody is a container for sections
  - The structuredBody class represents a CDA document Body that is composed of one or more document sections (Chief Complaint, Family History, Physical Exam, etc.)

- Document sections are used to organize and provide consistency to the contents of a document Body

- Sections contain narrative and can contain coded entries – this is the structure
  - Narrative is required - this is what the clinician is **attesting** to
  - Coded entries are optional
structuredBody Example – Chief Complaint

- Body starts with the component element
- Wrapped by structuredBody
- Section code specifies the section
- Text contains the ‘narrative block’
The Narrative Block

- Section.text (the Narrative Block) is mandatory
  - Exception is when the section is being used as a container for other sections
- Contents of the Narrative Block are what the clinician is attesting to
- The Narrative Block schema is a registered MIME-type, which is the fixed media type for Section.text
  - Supported tags:

<table>
<thead>
<tr>
<th>Tag</th>
<th>Description</th>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>content</td>
<td>Wraps content and specifies style codes</td>
<td>footnoteRef</td>
<td>References existing footnote</td>
</tr>
<tr>
<td>linkHTML</td>
<td>Similar to HTML &lt;a&gt; (anchor)</td>
<td>renderMultimedia</td>
<td>References external multimedia</td>
</tr>
<tr>
<td>sub</td>
<td>Subscript</td>
<td>paragraph</td>
<td>Similar to HTML &lt;p&gt; (paragraph)</td>
</tr>
<tr>
<td>sup</td>
<td>Superscript</td>
<td>table</td>
<td>Similar to HTML &lt;table&gt;</td>
</tr>
<tr>
<td>br</td>
<td>Line break</td>
<td>list</td>
<td>List (can be ordered or unordered)</td>
</tr>
<tr>
<td>footnote</td>
<td>Footnote</td>
<td>caption</td>
<td>Label</td>
</tr>
</tbody>
</table>
Comparing structuredBody and nonXMLBody

structuredBody

• A structuredBody follows markup rules for narrative text and CDA R2
  – Allows more fine-grained expression of meaning
  – More rigid than nonXMLBody
  – More difficult to implement than nonXMLBody but allows for greater exchange of data
  – Machine-computable (coded values)

nonXMLBody

• A nonXMLBody can be any supported format
  – The receiving application must be able to read:
    • The associated MIME type
    • The external file
  – Easier to implement than a structuredBody, but harder to exchange with other parties
  – Not guaranteed to be machine-computable (e.g., image)
Comparing structuredBody and nonXMLBody

- The CDA Body contains clinical information.
- A nonXMLBody can be any supported format while a structuredBody follows markup rules for narrative text and CDA.
- The Narrative Block is the section.text field that is used to store narrative to be rendered.
- Content of the Narrative Block are what the clinician is attesting to and can be displayed using a variety of HTML-like tags.
Combined with and complementary to structured Body

entry: for computational interoperability

- Uses LOINC/SNOMED CT or other controlled vocabulary
- Allows search, organization, and parsing by automated systems
- Standardized structure based on the Reference Information Model (RIM) and the HL7 pattern called a Clinical Statement
Entries

- Computable (coded) expression of a clinical information item:
  - Related to clinical care or public health
  - Recorded because it is relevant to patient care
    - Can be expressed with different levels of granularity, so detail and extension can vary
- Seven of the most common Entries are:
  - Clinical Measurements
  - Coded Findings
  - Laboratory Results
  - Encounters
  - Procedures
  - Medications
  - Product Supply
Entry Example

Procedures

<entry>
  <procedure classCode="PROC" moodCode="EVN">
    <code code="52734007">
      codeSystem="2.16.840.1.113883.6.96"
      displayName="Total Hip Replacement"/>
    <effectiveTime value="20120220"/>
    <targetSiteCode code="287679003">
      codeSystem="2.16.840.1.113883.6.96"
      displayName="left hip"/>
    </targetSiteCode>
  </procedure>
</entry>

Total Left Hip Replacement on 02-20-2012
CDA Constraint Levels

- The CDA implementation guides define conformance requirements at three different levels. Distinguished by granularity of machine-processable markup.
  - **Level 1** - Body is human-readable, no semantic codes
  - **Level 2** - Instances with machine-processible section-level semantics.
  - **Level 3** - Instances that have at least some clinical statements, expressions that are machine-processible to the extent that can be modeled in the RI
- All levels validate against the generic CDA schema.
Past Medical History

- Asthma
- Hypertension
- Osteoarthritis, right knee

Observation:
- Code: G-1001, DisplayName: Prior dx
- Value: D1-201A8, DisplayName: Osteoarthritis
  - Original Text: #a3
- Target Site Code: T-15720, DisplayName: Knee joint
  - Qualifier: G-C220, DisplayName: with laterality
    - Value: G-A100, DisplayName: right
  - Original Text: #a4

Level 1: Human readable
Level 2: Machine processible
Level 3: Machine processible
What Constraint Levels Provide

- Information can be encoded at varying levels of specificity and understood at the highest, or most appropriate, level of encoding.
- Information encoded at varying levels can be analyzed at the highest common level
- Incremental semantic interoperability
  - It is not necessary to immediately implement all of CDA. An incremental approach can be taken, where first, the CDA Header can be implemented, and used as a wrapper for existing clinical documents as part of a CDA Level 1 implementation. Next, specific sections can be implemented as part of a structuredBody CDA Level 2 implantation. Lastly, a fully coded CDA Level 3 implementation can be developed using CDA Entries.
1. Get the data flowing, get the data flowing, get the data flowing.
2. Incrementally add structure, where cost effective to do so.

Incremental Approach

Quality Reporting

Decision Support

Clinical Applications

Meaningful Use!

HL7 CDA Structured Documents

Coded Discrete Data Elements

SNOMED CT

- Disease, 07-00000
- Metabolic Disease, 06-00000
- Disorder of carbohydrate metabolism, 06-50000
- Disorder of glucose metabolism, 06-50100
- Diabetes Mellitus, DB-61000
- Type 1, DB-61010
- Neonatal, DB75110
- Carpenter Syndrome, DB-02324
- Insulin dependant type IA, DB-61020

Narrative Text

Patient: Judge, Larry
Id: 2214467
Admit: 2013-05-07
Account #: 334869

Discharge Meds:
- Kala 25 mg po daily (new)
- Zonar 40 mg po daily (new)
- Aleve 20 mg po every 8 hours (new)
- Lamaxyl 10 mg po daily (new)
- Omeprazol 20 mg po every 8 hours (new)
- Tabler 1 tab po TID

Discharge Diagnoses:
- Acute Myocardial Infarction x7 CABG
- Cardiogenic collapse
- Hypertension, aortic
- Diabetes Mellitus, type II
- Severe Allergies

Procedure: CABG, LIMA-LAD, SVG-Circ, SVG-Circ-
2/10/13

Medical History of Present Illness: This is a 81 year
history of Hypertension and diabetes admitted
with pain, and impairment. Please see the detailed
admission. He was noted to have non-
fungible papillomas on examination and
diabetes is a factor.
Implementation Guides (IGs)

- Developed by HL7 Structured Documents WG
  - With HL7 Domain Work Groups
  - By other standards organizations
  - By other agencies (CDC...)

- Balloted IGs to-date: US Realm-specific & Universal

- Define *templates* for CDA
Template Definition

- A template identifier (templateId) signals the imposition of a set of template-defined constraints.
- Document-level template

```xml
<ClinicalDocument>
  ...
  <!-- Conformant to updated NHSN Generic Constraints -->
  <templateId root="2.16.840.1.113883.10.20.5.4"/>
  ...
  <section>
    <templateId root="2.16.840.1.113883.10.20.5.5.6"/>
    ...
  </section>
  ...
</ClinicalDocument>
```
Templates can be imposed at three levels within a CDA:
(1) Document-level: applies to entire document
(2) Section-level: applies to the document section
(2) Entry-level: applies to entries within a document section

Section-level template

```xml
<section>
  <!-- CCD Vital signs section template -->
  <templateId root="2.16.840.1.113883.10.20.1.16"/>
  <code code="8716-3" codeSystem="2.16.840.1.113883.6.1"/>
  <title>Vital Signs</title>
  ...
</section>
```
Cooking with Templates

CDA Without Templates
- Like a kitchen full of raw ingredients, but no menu, recipes, cookbooks, or other guidance.
- Very flexible, but hard to work with if you are not an expert cook.
- Only the cook knows what’s going on until the meal has been cooked and delivered to the table.

Templated CDA
- Same kitchen, but…
- Full menu and recipes are provided.
- Food is prepped and ready to be cooked to order according to the provided recipes.
- Less flexible, but much easier for the novice to work with.
- Both the cook and the diner know what to expect.
Cookbook Approach

The template (recipe) defines the basic structure, then an implementer (cook) fills in the blanks with live data (ingredients).

Recipe: populate the [blue] fields with appropriate data.

Fully cooked data.
Examples
Example 1 – Sending Data
Scenario: A patient is experiencing severe knee pain and is referred to an Orthopedist by their Primary Care Provider (PCP). The PCP needs to generate a summary document to provide to the Orthopedist.

No single C-CDA Document Template includes all of the elements needed to satisfy the data requirements.

NOTE: The Document Templates within C-CDA are considered “open” templates, which means that, in addition to the required and optional Sections defined in the template, an implementer can add to the Document whatever C-CDA Sections are necessary for his purposes.
How do I send the data?

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultation Note</td>
<td>According to CMS evaluation and management guidelines, a Consultation Note must be generated as a result of a physician or non-physician practitioner's (NPP) request for an opinion or advice from another physician or NPP.</td>
</tr>
<tr>
<td>Continuity of Care Document (CCD)</td>
<td>The CCD 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.</td>
</tr>
<tr>
<td>Discharge Summary</td>
<td>The Discharge Summary is a document that is a synopsis of a patient's admission to a hospital; it provides pertinent information for the continuation of care following discharge.</td>
</tr>
</tbody>
</table>

The C-CDA IG has 9 documents, but the three likely candidates for this situation are displayed above.

- Each C-CDA Document Template was designed to satisfy a specific information exchange scenario.
- Each document template defines the CDA structures to be used to document the applicable clinical information.
**Scenario:** A patient is experiencing severe knee pain and is referred to an Orthopedist by their Primary Care Provider (PCP). The PCP needs to generate a summary document to provide to the Orthopedist.

In this scenario, treatment has been provided by a PCP:

- Given that this treatment is in an ambulatory setting, a **Discharge Summary** would not be appropriate.

- Since the PCP HAS NOT been providing care at the request of another provider, a **Consultation Note** would not be appropriate.

- Given the **clinical scenario** to be described, a **Continuity of Care Document (CCD)** is the most appropriate C-CDA Document Template to use.
Include C-CDA components defined by the Document Template (REQUIRED)

Start with the Sections required by the CCD Template in the C-CDA IG:

- US Realm Header
- Allergies
- Medications
- Problem
- Results

US Realm Header

Sections
- Allergies
- Medications
- Problem
- Results

NOTE: Sections are required for a Document Template when the information contained in those sections will ALWAYS BE clinically relevant to the clinical scenario the document template is intended to describe.
Include C-CDA components defined by the Document Template (OPTIONAL)

Continue by adding the *clinically relevant* Sections that are optional in the CCD Template in the C-CDA IG:

**NOTE:** Sections are optional for a Document Template when the information contained in those sections will *SOMETIMES BE* clinically relevant to the clinical scenario the document template is intended to describe.

- Encounters
- Plan of Care
- Vital Signs
  - Advance Directives
  - Family History
  - Functional Status
  - Immunizations
  - Medical Equipment
  - Payers
  - Procedures
  - Social History

US Realm Header

Sections
- Allergies
- Encounters
- Medications
- Plan of Care
- Problem
- Results
- Vital Signs
Add Data from the source systems

<table>
<thead>
<tr>
<th>Needed Data</th>
<th>Specific Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Care plan</td>
<td>• Provider Name &amp; Office Contact Information (Ambulatory Only)</td>
</tr>
<tr>
<td>• Care team member(s)</td>
<td>• Reason for Referral (Ambulatory Only)</td>
</tr>
<tr>
<td>• Date of birth</td>
<td>• Encounter Diagnoses **</td>
</tr>
<tr>
<td>• Ethnicity **</td>
<td>• Cognitive Status</td>
</tr>
<tr>
<td>• Laboratory test(s) **</td>
<td>• Functional Status</td>
</tr>
<tr>
<td>• Laboratory value(s)/result(s)</td>
<td>• Discharge Instructions (Inpatient Only)</td>
</tr>
<tr>
<td>• Medications **</td>
<td>• Immunizations **</td>
</tr>
<tr>
<td>• Medication allergies **</td>
<td></td>
</tr>
<tr>
<td>• Patient name</td>
<td></td>
</tr>
<tr>
<td>• Preferred language</td>
<td></td>
</tr>
<tr>
<td>• Problem **</td>
<td></td>
</tr>
<tr>
<td>• Procedures **</td>
<td></td>
</tr>
<tr>
<td>• Race **</td>
<td></td>
</tr>
<tr>
<td>• Sex</td>
<td></td>
</tr>
<tr>
<td>• Smoking status **</td>
<td></td>
</tr>
<tr>
<td>• Vital signs</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Data requirements marked with a double asterisk (**) also have a defined vocabulary which must be used
Review the data to ensure its populated

Some of the data requirements have already been met through use of the C-CDA Document Template; some may also not apply to the care setting

- Care team member(s)
- Date of birth
- Ethnicity **
- Patient name
- Preferred language
- Provider Name & Office Contact Information (Ambulatory Only)
- Race **
- Sex
- Allergies **
- Medications **
- Care Plan
- Reason for Referral (Ambulatory Only)
- Problems **
- Encounter Diagnoses **
- Laboratory test(s) **
- Laboratory value(s)/result(s) **
- Vital Signs

US Realm Header

Sections
Allergies
Encounters
Medications
Plan of Care
Problem
Results
Vital Signs
C-CDA Sections are added to the CCD to address the outstanding data requirements.

- Hospital Discharge Instructions (Inpatient Only)
- Cognitive Status
- Immunizations **
- Procedures **
- Smoking Status **

US Realm Header
- Sections
  - Allergies
  - Encounters
  - Functional Status
  - Immunizations
  - Medications
  - Plan of Care
  - Problem
  - Procedures
  - Results
  - Social History
  - Vital Signs
Scenario: A patient is experiencing severe knee pain and is referred to an Orthopedist by their Primary Care Provider (PCP). The PCP needs to generate a summary document to provide to the Orthopedist.

- The Continuity of Care Document (CCD) Document Template was the best fit for the clinical workflow in this scenario.
- Many of the data requirements were met using the C-CDA document template.
- Additional sections were added as necessary to meet outstanding data requirements.

MU C-CDA
Rendered CCD Example

“Good Health Health Summary” from the “U.S. Realm” Header (Document Title element)

“Document ID” from the “U.S. Realm” Header (Document ID element)

“Allergies”, “Medications” & “Problems” sections implemented to meet “CCD” and Transition of Care Objective requirements


CDA documents must have a canonical human readable form.

The CDA Header can be used in conjunction with the nonXML body to transfer existing clinical documents.

CDA allows for an incremental approach to development.

CDA Implementation Guides are intended to define different kinds of documents, specifying the expected sections and any clinical statement entries or machine processable content.
Thank you!

Russell Hamm
Lantana Consulting Group
russ.hamm@lantanagroup.com