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Curriculum Development Centers Program

Awardee of The Office of the National Coordinator for Health Information Technology

Component 9 - Networking and Health Information Exchange

Unit 4-6 - Basic Health Data Standards

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Unit 4-6 Objectives

- Discuss
  - Clinical Data Architecture (CDA)
  - Continuity of Care Document (CCD)
  - Continuity of Care Record (CCR) Standards

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Clinical Document Architecture

- Document markup standard that specifies the structure and semantics of "clinical documents" for the purpose of exchange.
- Defined information object that can include text, images, sounds, and other multimedia content.
- The architecture specifies the schemas required for exchange.

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Characteristics of CDA

- Persistence
- Stewardship
- Potential for authentication
- Context
- Wholeness
- Human readability

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Key Aspects of CDA

- The CDA specification is richly expressive and flexible
- Encoded in XML
- Data elements derive their meaning from the HL7 RIM
- Uses the HL7 Data Types

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CDA

- Allows cost-effective implementation across as wide a spectrum of systems as possible.
- Support exchange of human-readable documents between users, including those with different levels of technical sophistication.
- Promote exchange that is independent of the underlying transfer or storage mechanism.

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Major Components

- A CDA document is wrapped by the <ClinicalDocument> element, and contains a header and a body
- The header lies between the <ClinicalDocument> and the <StructuredBody> elements and identifies and classifies the document
- Provides information on authentication, the encounter, the patient, and the involved providers

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XML Markup for CDA

- XML tag is defined <tag>
- Data is expressed as data element name
- Data value is “value”
- Each entry has a start tag <tag> and a stop tag </tag>.
  - <code> code = “11488-4” </code>
- Entries may be nested.

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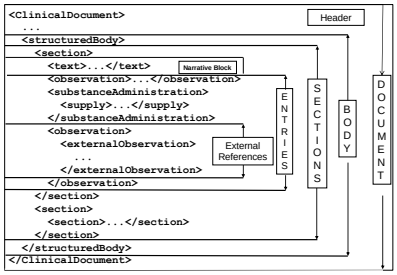
Major Components of a CDA Document



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Header Components

- Contextual header
  - Author
  - Confidentiality
  - Data enterer
  - Human language
  - Informant
  - Legal authenticator
  - Participant
  - Record target

Sets context for the entire document

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Major Components

```
<ClinicalDocument>
  ... CDA Header ...
  <StructuredBody>
    <section>
      <text>...</text>
      <Observation>...</Observation>
      <Observation>
        <reference>
          <ExternalObservation>...</ExternalObservation>
        </reference>
      </Observation>
    </section>
    <section>
      <section>...</section>
    </section>
  </StructuredBody>
</ClinicalDocument>
```


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CDA Specification

• Permits the use of document codes and section codes.
• Possible to differentiate a "Consultation Note" from a "Discharge Summary"
  • The two will have distinct document codes in the document instance.

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Rendering Tags

```
<section>
<text>
<content emphasis="bold">
    This is rendered bold,
        <content emphasis="italics">
            this is rendered bold and italicized,
        </content>
    this is rendered bold.
</content>
</text>
</section>
```


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```
section>
    <code code="10153-2" codeSystem="2.16.840.1.113883.6.1"
     codeSystemName="LOINC"/>
    <title>Past Medical History</title>
    <text>
        There is a history of <content ID="a1">Asthma</content>
    </text>
    <entry>
        <Observation>
            <code code="84100007
                codeSystem="2.16.840.1.113883.6.96"
                codeSystemName="SNOMED CT"
                displayName="history taking (procedure)"/>
            <value xsi:type="CD" code="195967001"
                codeSystem="2.16.840.1.113883.6.96"
                codeSystemName="SNOMED CT"
                displayName="Asthma">
                  <originalText>
                      <reference value="#a1"/>
                  </originalText>
            </value>
        </Observation>
    </entry>
</section>
```


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LOINC Document Codes

- 28568-4 Visit Note Emergency Department Physician
- 34862-3 Admission Evaluation Note Inpatient Attending General Medicine
- 11488-4 Consultation Note {Setting} {Provider}

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Continuity of Care Document

- The content of the CCR was reflected into the CDA in a manner consistent with other models being developed by HL7.
- This method accelerated convergence within HL7 around a common clinical statement model
  - Leading to closer collaboration with several domain committees
  - Such as results, family history, allergies, problems and medications

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CCD Sections

- Payers
- Advance Directives
- Support
- Functional Status
- Problems
- Family History
- Social History
- Alerts, allergies, AE
- Medications
- Medical Equipment
- Immunizations
- Vital Signs
- Results
- Procedures
- Encounters
- Plan of Care

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CCD

```
<Results>
  <Result>
    <CCRDataObjectID>
      2.16.840.1.113883.19.1
    </CCRDataObjectID>
    <DateTime>
      <Type>
        <Text>Assessment Time</Text>
      </Type>
      <ExactDateTime>
        20000407143O
      </ExactDateTime>
    </DateTime>
    <Type>
      <Text>Hematology</Text>
    </Type>
    <Description>
      <Text>CBC WO DIFFERENTIAL</Text>
      <Code>
        <Value>43789009</Value>
        <CodingSystem>SNOMED CT</CodingSystem>
      </Code>
    </Description>
    <Status><Text>Final Results</Text></Status>
```

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CCD - 2

```
<section>
  <templateId root="2.16.840.1.113883.10.20.1.14"/>
  <code code="30954-2"
    codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC"/>
  <title>Laboratory results</title>
  <text>
    CBC (04/07/2000): HGB 13.2; WBC 6.7; PLT 123*
  </text>
  <entry>
    <organizer classCode="BATTERY" moodCode="EVN">
      <templateId
root="2.16.840.1.113883.10.20.1.32"/>
      <id root="2.16.840.1.113883.19" extension="1"/>
      <code code="43789009"
        codeSystem="2.16.840.1.113883.6.96"
        codeSystemName="SNOMED CT"
        displayName="CBC WO DIFFERENTIAL"/>
      <statusCode code="completed"/>
      <effectiveTime value="200004071430"/>
```


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Continuity of Care Record

- Patient health summary detail
- Flexible document
- Relevant and timely core information about patients for exchange among patients
- Standard from ASTM
- XML syntax

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CCR Content

- Demographics
- Diagnosis
- Problem list
- Medication
- Allergies
- Insurance
- Care Plan

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Summary

- Structured documents have great power to enable interoperability
- Structure complicated but content simple
  - Data elements with XML tags
- Permits migration from narrative text to coded data
  - Key to migration to interoperability
- Internationally becoming the exchange document of choice