

# Introduction to CDA and C-CDA

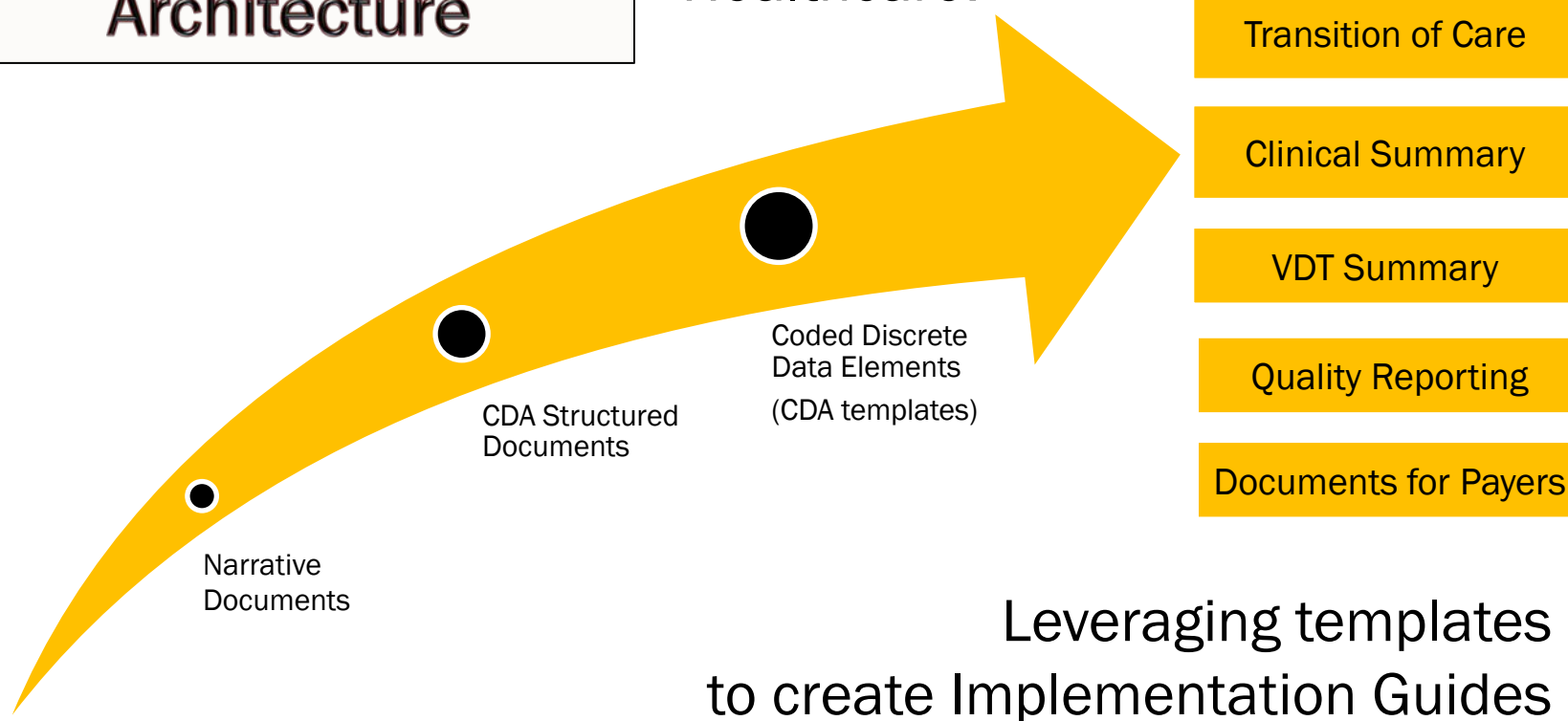
HIMSS 2016

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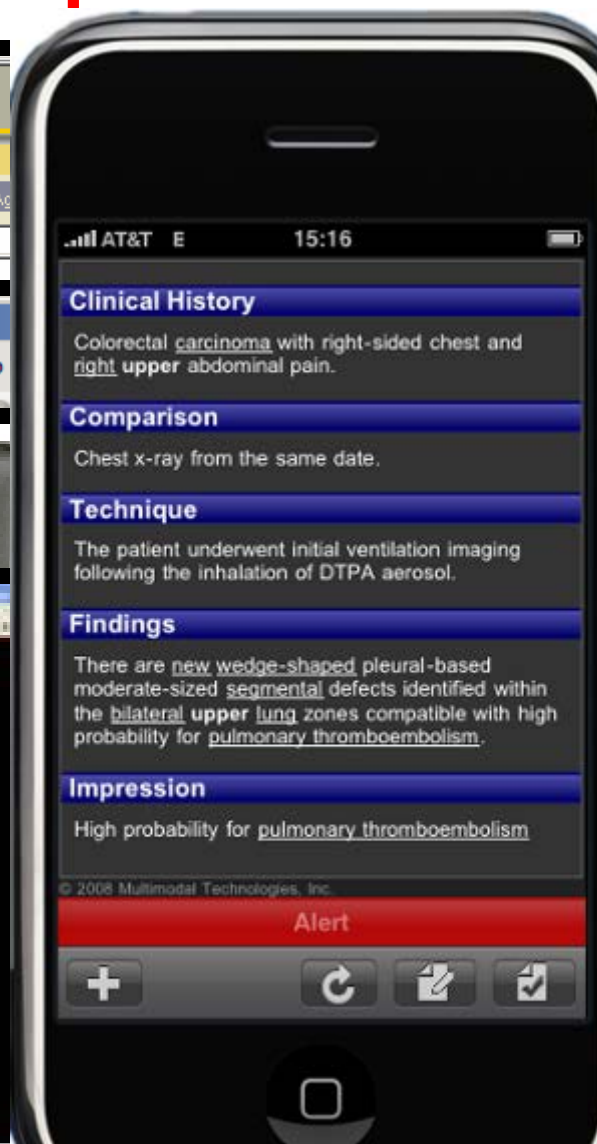
# CDA Clinical Document Architecture

A single XML schema for all  
Clinical Documents in  
Healthcare!



# CDA: A Document Exchange Specification

- This is a CDA
- and this
- and this
- and this
- and this
- and this



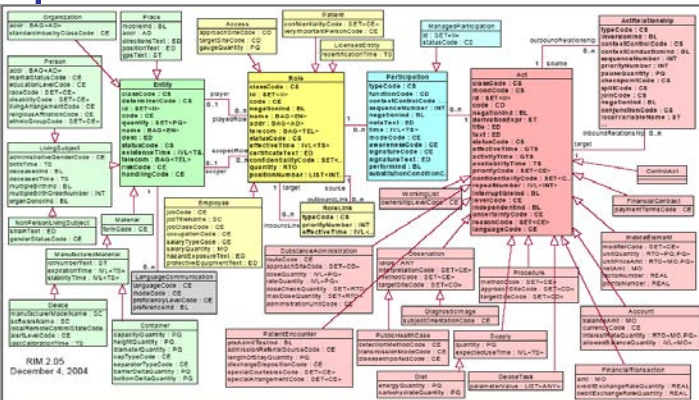
# Key Aspects of the CDA

- CDA documents are encoded in Extensible Markup Language (XML).
- CDA documents derive their meaning from the HL7 Reference Information Model (RIM).
- The CDA specification is richly expressive and flexible. Templates and implementation guides can be used to constrain the generic CDA specification.

# How the CDA is Developed and Maintained:

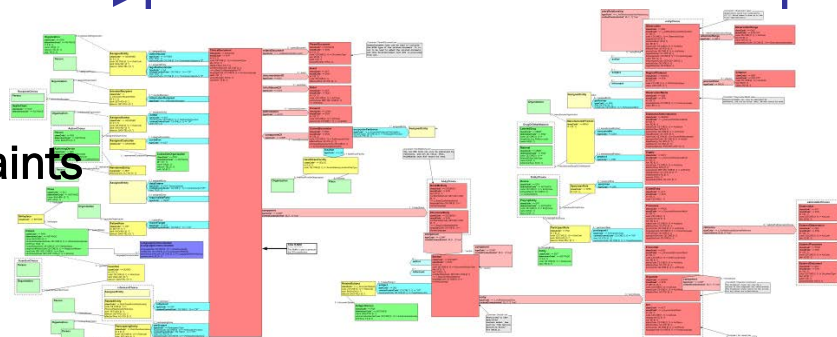
## just enough HL7 Development Framework

### Reference Information Model



- subset of RIM
- tighten constraints

### RMIM



- linearization
- additional constraints

### XML Schema

- algorithm

### Hierarchical Description

ClinicalDocument				Document				ClinicalDocument				N			
1	typeId	1.1	M	R	InfrastructureRoot	II		1	typeId	1.1	M	R	InfrastructureRoot	II	
2	classCode	1.1	M	R	Act	CS		2	classCode	1.1	M	R	Act	CS	
3	moorCode	1.1	M	R	Act	CS		3	moorCode	1.1	M	R	Act	CS	
4	id	1.1	R	Act	II			4	id	1.1	R	Act	II		
5	code	1.1	R	Act	CE			5	code	1.1	R	Act	CE		
6	title	0.1	R	Act	ST			6	title	0.1	R	Act	ST		
7	effectiveTime	1.1	R	Act	TS			7	effectiveTime	1.1	R	Act	TS		
8	confidentialityCode	1.1	R	Act	CE			8	confidentialityCode	1.1	R	Act	CE		
9	languageCode	0.1	R	Act	CS			9	languageCode	0.1	R	Act	CS		
10	selfId	0.1	R	ContextStructure	ContextStructure			10	selfId	0.1	R	ContextStructure	ContextStructure		
11	versionNumber	0.1	R	Document	Document			11	versionNumber	0.1	R	Document	Document		
12	copyTime	0.1	R	Document	Document			12	copyTime	0.1	R	Document	Document		
13	authenticator	0.*	R	Act	SET<Authenticator>			13	authenticator	0.*	R	Act	SET<Authenticator>		
14	typeCode	1.1	M	R	Participation	CS		14	typeCode	1.1	M	R	Participation	CS	
15	time	1.1	R	Participation	TS			15	time	1.1	R	Participation	TS		
16	signatureCode	1.1	R	Participation	CS			16	signatureCode	1.1	R	Participation	CS		
17	assignedEntity	1.1	R	Participation	AssignedEntity			17	assignedEntity	1.1	R	Participation	AssignedEntity		
18	classCode	1.1	M	R	Role	CS		18	classCode	1.1	M	R	Role	CS	
19	id	1.*	R	Role	SET<id>			19	id	1.*	R	Role	SET<id>		
20	code	0.1	R	Role	CE			20	code	0.1	R	Role	CE		
21	addr	0.*	R	Role	SET<addr>			21	addr	0.*	R	Role	SET<addr>		





# HL7's CDA vs. C-CDA

- CDA **the schema for structured documents**

The HL7 Clinical Document Architecture (CDA) is a document markup standard that specifies the structure and semantics of "clinical documents" for the purpose of exchange.

- C-CDA **defines a set of CDA documents**

The HL7 Consolidated CDA is an implementation guide which specifies a library of templates and prescribes their use for a set of specific document types.

# Health Story Project

- Develop CDA Implementation Guides (IGs) for common types of electronic healthcare documents
- Bring them through the HL7 ballot process
- Promote their use and adoption by healthcare organizations and health information exchange networks
- see [www.healthstory.com](http://www.healthstory.com)



# Consolidation Project

1. HL7 Consult Note
2. HL7 Diagnostic Imaging Report
3. HL7 Discharge Summary
4. HL7 History and Physical
5. HL7 Operative Note
6. HL7 Procedure Note
7. HL7 Unstructured Documents
8. HL7 Progress Notes
9. HL7 Continuity of Care Document
10. HITSP/C84 Consult and History & Physical Note Document
11. HITSP/C32 - Summary Documents Using HL7 CCD
12. HITSP/C48 Referral and Discharge Summary
13. HITSP/C62 Scanned document

HEALTH  
STORY  
PROJECT



One master  
implementation guide

*Health Story supported  
guides in blue*

# Consolidation Project Goals

- Update and harmonize C32 while addressing known issues (ambiguity, gaps, etc.)
  - initially, those issues identified by ONC and required for Meaningful Use (open technical issues from HITSP, etc.)
  - next, those reused in Health Story
  - finally, if time allows, full set of CCD/C32 templates
- Proof of concept for model-driven, structured tools supporting easy to use developer documentation
- Rapid demonstration of templated CDA as a data

# C-CDA 1.1 → C-CDA 2.1

**Consolidated CDA**  
**IHE Health Story**  
**Consolidation, Release**  
**1.1**



✓ **Consolidated CDA**  
**Templates for Clinical**  
**Notes, Release 2.1**

- ✓ Care Plan
- Consultation Notes
- Continuity of Care Document\*
- Discharge Summary
- History and Physical
- Diagnostic Imaging Reports
- Operative Note
- ✓ Patient Generated Document
- Progress Note
- Procedure Note
- ✓ Referral Note
- ✓ Transfer Note
- Unstructured

# HL7 Attachments WG – CDP1

## CDP1

Additional CDA R2 Templates –  
Clinical Documents for Payers –  
Set 1

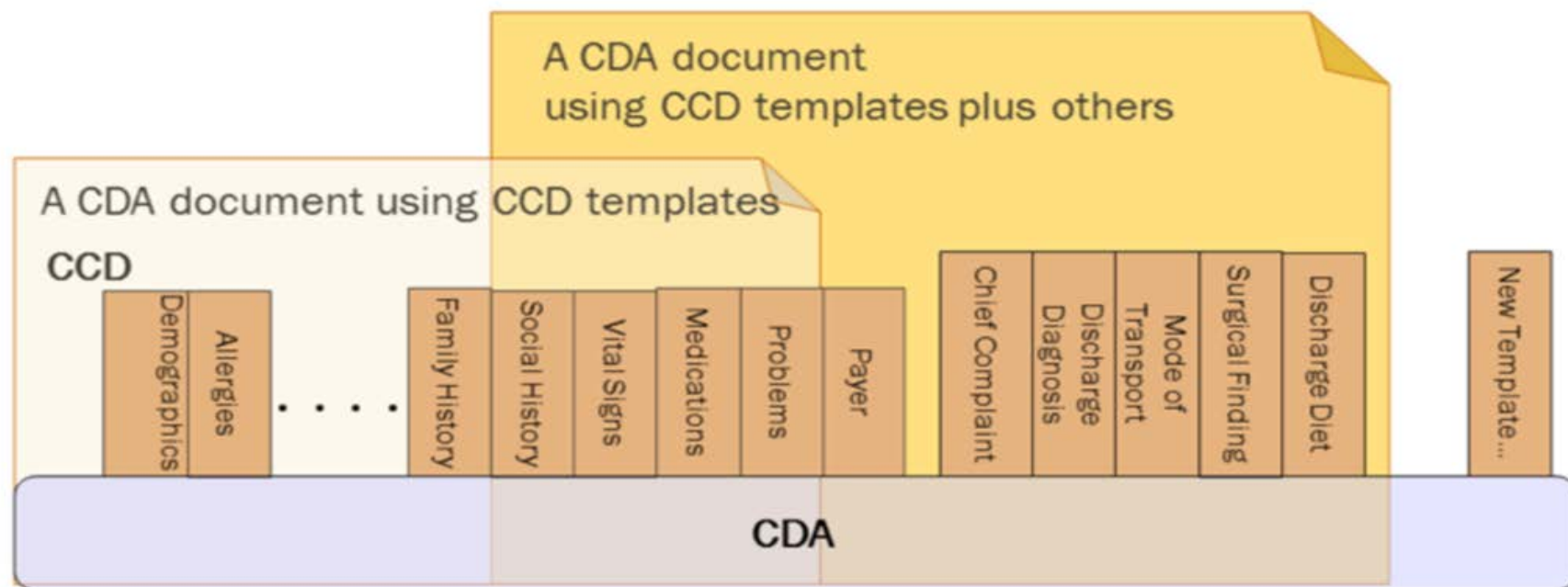
- ✓ 1. Complete Encounter
- ✓ 2. Complete Hospitalization
- ✓ 3. Complete Operative Note
- ✓ 4. Complete Procedure Note
- ✓ 5. Time Boxed

### Rational for CDP1 document types:

- 1) Current C-CDA documents require very few sections
- 2) EHR vendors frequently support only required sections
- 3) Certification requires support only for the CCD and some sections
- 4) Providers experience large variability in C-CDA optionality
- 5) Digital signatures fix content at time of signing

The Clinical Documents for Payers, reduces optionality, by requiring essentially all content to ensure that vendors support its generation.

# Template Libraries for CDA



The mechanism most commonly used to constrain CDA is referred to as “templated CDA”. In this approach, a library is created containing modular CDA templates such that the templates can be reused across any number of CDA document types

# A system of templates...

- **Document-level templates:** These templates constrain fields in the CDA header, and define containment relationships to CDA sections.
- **Section-level templates:** These templates constrain fields in the CDA section, and define containment relationships to CDA entries.
- **Entry-level templates:** These templates constrain the CDA clinical statement model in accordance with real world observations and acts.
- **Reuse templates:** These templates group a common set of constraints for reuse in CDA documents. i.e. names, dates, ...

# 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).

```
<observation classCode="OBS" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.6.2.10" />
  <code code="[code]"
    codeSystem="[code_system]"
    codeSystemName="[code_system_name]"
    displayName="[display_name]" />
  <statusCode code="completed" />
  <effectiveTime value="[measurement_date]" />
  <value xsi:type="PQ"
    value="[measure]" unit="[ucum_unit]" />
</observation>
```

Recipe: populate the **[bolded]** fields with appropriate data.

```
<observation classCode="OBS" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.6.2.10" />
  <code code="50373000"
    codeSystem="2.16.840.1.113883.6.96"
    codeSystemName="SNOMED-CT"
    displayName="Body height" />
  <statusCode code="completed" />
  <effectiveTime value="20121114" />
  <value xsi:type="PQ"
    value="177" unit="cm" />
</observation>
```

Fully *cooked* data.

# Challenges (Opportunities)

## Numerous CDA IGs have been developed:

- Certified EHRs are required to support a number of them
- All IGs are typically Draft Standards for Trial Use (DSTU)

## What have we learned:

- Each implementation is slightly different,
  - *Inherent differences – source systems, narrative*
  - *Interpretation differences – communications and content*
  - *Best Practice differences – SHALL, SHOULD and MAY*
  - *Weakness in the Standards / Guidance / Samples*
  - *There is a need to adopt a set of best practices with CDA!*

# The Opportunity...

## Solicit Feedback:

- Use the SDWG Listserv
- DSTU Comment page for feedback
- Additional venues (C-CDA Survey, Implementation-A-Thon)

## More samples:

- SDWG sample taskforce – 40 new templates approved
  - More in the pipeline, under development
- C-CDA Companion Guide

## Best practices:

- Read the standards and implementation guides
- Review the extensive set of samples developed
- Removing optionality will require wider industry participation of both vendors / practices.

# How can you be heard?

- What's next?
  - HL7 C-CDA Survey
  - Upcoming HL7/ONC C-CDA Implementation-A-Thon (in Chicago, April 14-15, 2016)
  - Participate in review of C-CDA Companion Guide



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