Templated CDA and CDA Consolidation Project

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What is templated CDA?
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**History**
- Frequency of wheezing:
  - Daily and continual.
  - Daily but not continual.
- Episodes per week:

**Labs**
- Peak Flow: __________ l/m.

**Assessment**
- Asthma, Intermittent.
- Asthma, Mild Persistent.
- Asthma, Moderate Persistent.
- Asthma, Severe Persistent.

**Plan**
- Pneumococcal Vaccine
- Complete PFTs with lung volumes.
- Provide education on peak flow self-monitoring.
- Environmental and Occupational screening questionnaire.
- Teach inhaler/spacer/holding chamber technique.
- Discuss environmental control measures to avoid exposure to known allergens and irritants.
- Teach self-monitoring.
What is templated CDA?

```xml
<section>
  <templateId root="2.16.840.1.113883.3.27.354"/>
  <title>Plan</title>
  <text>Complete PFTs with lung volumes; Provide education on peak flow self-monitoring; ...</text>
  <entry>
    <observation classCode="OBS" moodCode="INT">
      <code code="23426006" codeSystem="&SNOMEDCT;"
           displayName="Pulmonary function test"/>
    </observation>
  </entry>
  <entry>
    <act classCode="ACT" moodCode="INT">
      <code code="223468009" codeSystem="&SNOMEDCT;"
            displayName="Teaching of skills">
        <qualifier>
          <name code="363702006" displayName="has focus"/>
          <value code="29893006" displayName="Peak flow rate measurement"/>
        </qualifier>
      </code>
    </act>
  </entry>
</section>
```
Templated CDA business case

- **Streamlined standards development**
  - Reusable building blocks.

- **Streamlined standards implementation**
  - Implement once, deploy often.

- **Modular and reusable**
  - Templates (e.g., blood pressure, discharge diagnosis) can be repackaged with other templates in any number of CDA implementation guides.

- **Core component of CDA’s “incremental interoperability” strategy**
  - Begin with simple CDA, and add templates as they are prioritized.
 Templates are computable artifacts
Templates are computable artifacts

- CDA Template Library
  - CDA Implementation Guide
  - greenCDA
    - XML
  - Data Entry Form
  - CDA Instance Validation
  - Runtime API

Support for standards development
Support for standards implementation
Standards Development

- ~ 42 templates per guide: 24 new, 18 reused.
Standards Harmonization

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Thousand flowers bloom

Active harmonization

Gradual increase in templates, per new use cases

today
Standard EHR Interface

Local EHR

National Meaningful Use

Clinical reuse

Decision support

Secondary use

Quality reporting

CDA Template Library
Templed CDA Interoperability Roadmap

EHR Repository

Clinical Applications

Coded Data Elements via Templates

SNOMED CT

- Disease, DF-00000
- Metabolic Disease, D6-00000
- Disorder of carbohydrate metabolism, D6-50000
- Disorder of glucose metabolism, D6-50100
- Diabetes Mellitus, DB-61000
- Neonatal, DB-75110
- Type 1, DB-61010
- Carpenter Syndrome, DB-02324
- Insulin dependant type IA, DB-61020

Narrative Text

HL7 CDA Structured Documents

- \<component id="">
- \<extension value="">
- \<code system="">
- \<display_text="">
- \<value="">
- \<name="">
- \<time="">
- \<instantiation value="">

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Templated CDA

- Many different kinds of documents.
- A bucket of reusable templates.

A CDA document using CCD templates plus others

A CDA document using CCD templates

CCD
- Demographics
- Allergies
- Family History
- Social History
- Vital Signs
- Medications
- Problems
- Payer

CDA
- Chief Complaint
- Diagnosis
- Discharge
- Mode of Transport
- Surgical Finding
- Discharge Diet
- New Section...
Templated CDA Implementation challenge

- Creation of an instance conforming to a particular CDA Implementation Guide may require knowledge of:
  - CDA R2 base specification;
  - HL7 Version 3 data type specification;
  - CDA templates defined in the particular IG;
  - CDA templates referenced by the particular IG;
  - Terminology code lists defined/referenced by the particular IG;

- Validation of an instance conforming to a particular CDA IG may require:
  - W3C Schema validation;
  - Schematron validation;
One solution = Consolidate!

- Consolidated library of reusable CDA templates and common document types:
  - CCD
  - Consultation Note
  - Diagnostic Imaging Report
  - Discharge Summary
  - H&P
  - Operative Note
  - Procedure Note
  - Progress Note
  - Unstructured Document
Another Solution - **greenCDA**

- Create an “authoring schema” that simplifies the creation and processing of a particular CDA IG:
  - Clinically meaningful XML element and attribute names;
  - 100% transformable into conformant CDA IG;
  - Hides certain CDA complexities (such as moodCodes, fixed attributes, etc).

- We call this strategy: **greenCDA**
  - **greenCDA** schemas are modular, corresponding to CDA templates.
An example – build the greenCDA module

Requirements

<table>
<thead>
<tr>
<th>CDA Data Location</th>
<th>HITSP Data Element Identifier and Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>cda:observation[cda:templateId/@root = '2.16.840.1.113883.10.20.1.31']</td>
<td>Result Event Entry</td>
</tr>
<tr>
<td>cda:id</td>
<td>15.01 - Result ID</td>
</tr>
<tr>
<td>cda:effectiveTime</td>
<td>15.02 - Result Date/Time</td>
</tr>
<tr>
<td>cda:code/@code</td>
<td>15.03 - Result Type</td>
</tr>
<tr>
<td>cda:statusCode</td>
<td>15.04 - Result Status</td>
</tr>
<tr>
<td>cda:value</td>
<td>15.05 - Result Value</td>
</tr>
<tr>
<td>cda:interpretationCode/@code</td>
<td>15.06 - Result Interpretation</td>
</tr>
<tr>
<td>cda:referenceRange</td>
<td>15.07 - Result Reference Range</td>
</tr>
</tbody>
</table>

<result>
  <resultID>
  <resultDateTime>
  <resultType>
  <resultStatus>
  <resultValue>
  <resultInterpretation>
  <resultReferenceRange>
</result>
An example – create a conformant instance

**greenCDA** instance

```
<result>
  <resultID>
  <resultDateTime>
  <resultType>
  <resultStatus>
  <resultValue>
  <resultInterpretation>
  <resultReferenceRange>
</result>
```

Conformant CDA instance

```
<!-- These examples assume the default namespace is 'urn:hl7-org:v3' -->
<observation classCode='OBS' moodCode='EVN'>
  <templateId root='2.16.840.1.113883.10.20.1.31'/>
  <templateId root='2.16.840.1.113883.3.88.11.83.15'/>
  <templateId root='1.3.6.1.4.1.19376.1.5.3.1.4.13'/>
  <code code='...' displayName='...' codeSystem='2.16.840.1.113883.6.1'
    codeSystemName='LOINC'/>
  <effectiveTime low value='...'/>
  <statusCode value='N'/>
  <value xsi:type='PQ' value='100' unit='g/dl'/>
  <interpretationCode code='N' codeSystem='2.16.840.1.113883.5.83'/>
  <referenceRange>
    <observationRange>
      <text>M 13-18 g/dl; F 12-16 g/dl</text>
    </observationRange>
  </referenceRange>
</observation>
```
CDA template tools

Model-Driven Health Tools (MDHT) CDA Tools

This website contains demonstrations and other reference documents from the Open Health Tools (OHT) Model-Driven Health Tools (MDHT) project.

- MDHT CDA Tools User Guide
  Documentation on creating, editing, and generating Java code from CDA models

- Validate CDA instances
  Example web application that validates CDA instances. Supports models defined in the above implementation guides. All validation rules are executed as Java and OCL code generated from the UML models.

- On-line implementation guides for CDA template models

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For Immediate Release

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HL7 Releases New Tool for Capturing, Storing and Managing CDA® Templates

“Trifolia Workbench” Beta Release supports standards development and localization; includes library of meaningful use templates

Ann Arbor, Michigan, USA – July 19, 2011 – Health Level Seven® International (HL7®), the global authority for interoperability and standards in healthcare information technology with members in 55 countries, today announced the release of the Trifolia Workbench: Consolidation Project Edition 1.0, Beta Release. This release supports standards authors, developers, and implementers in capturing, storing and managing HL7 Clinical Document Architecture (CDA) templates. It contains the full set of templates balloted through the HL7/THF Health Story Consolidation Project, which harmonized health information exchange specifications for meaningful use of EHR technology. The project covered the HL7 Continuity of Care Document (CCD) and the Health Story implementation guides for Commerce, Under the theme of 

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Thank you!