



# Open**HIE**

## OpenSHR CDA Implementation

Technical documentation related to the implementation of Clinical Document Architecture (CDA) within OpenMRS for the OpenSHR project.  
OpenSHR is a sub-community of the OpenHIE Project

Technical  
Documentation

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## 1. Introduction

This document seeks to provide technical documentation related to the implementation of Clinical Document Architecture (CDA) within the OpenSHR implementation.

OpenSHR is implemented as a series of modules which can be installed into OpenMRS to fulfill the requirements of an OpenHIE compliant Shared Health Record (SHR) actor. There are several features of OpenSHR which make it an OpenHIE compliant SHR:

- **IHE XDS (Cross-Enterprise Document Sharing):** The XDS module for OpenSHR allows it to behave as an XDS.b document repository. In this role, OpenSHR can receive documents submitted via a Provide and Register (ITI-41) transaction and serve requests to retrieve submitted documents via a Retrieve Document Set (ITI-43) transactions.
- **Content Consumer:** The CDA handler module allows OpenSHR to parse CDA documents submitted via XDS into its discrete data elements, or sections (depending on the quality of the submitted CDA document).
- **IHE ODD (On-Demand Documents):** The ODD module for OpenSHR allows the SHR to generate summary documents for patients whenever requested. These documents are registered with an XDS Registry and, unlike stable documents, do not exist until retrieved.
- **Auditing & Accountability:** The ATNA module for OpenSHR allows it to produce RFC-3881 compliant audit messages whenever data is imported or exported to/from the OpenSHR data store respectively. These audits are collected in a central audit repository within the OpenHIE compliant Audit Repository.

### 1.1. Introduction to Cross-enterprise Document Sharing

From an IT Infrastructure standpoint, the concept of sharing document encapsulates the necessary functionality to ship “snapshots in time” of medical conditions, summaries and data from one system to another. A document can carry unstructured data (such as images, PDFs, etc.) or structured clinical data which is imported/exported and updated over time.

In IHE, document transport is facilitated through a series of XD\* profiles which enterprise level sharing being attained through the XDS and XCA (Cross-community access) profiles.

OpenSHR supports the IHE XDS profiles necessary to act as a Document Repository and On-Demand Document Source actors.

In simple terms, this means that a system acting as a Document Source produces a document and sends that document to the OpenSHR XDS interface as a Provide and Register (ITI-41) transaction. OpenSHR stores that document, and if supported, imports the contents of that document to a discrete data store. It then notifies an XDS registry that a document is available (and if supported, a series of on-demand documents) producing audits along the way.

At a later time, a system acting as a Document Consumer actor will retrieve a document from the OpenSHR XDS interface as a Retrieve Document Set (ITI-43) transaction. OpenSHR will determine if the document being requested is stable (i.e. was provided to it by a third party) or on-demand (i.e. it needs to assemble the document) and takes the necessary action to retrieve that document. It then returns this document data to the Document Consumer auditing appropriately along the way.

The terms “stable document” and “on-demand document” speak to the type of document which OpenSHR is storing. In all cases, a document given to OpenSHR (i.e. submitted by a document source to OpenSHR), is a “stable” document. This means that OpenSHR will never “peer” or alter the document itself, it will be preserved as submitted. For more information about stable documents see Interfacing with OpenSHR on page 6.

On the other hand, and on-demand document is a document which doesn’t physically exist until a document consumer requests it. These documents carry logical document identifiers and are materialized based on the supplied document template the logical document entry associated with. These on-demand documents are Clinical Document Architecture (CDA) documents which are created based on the contents of stable CDA documents provided to OpenSHR.

## 1.2. Introduction to Clinical Document Architecture

HL7 Clinical Document Architecture (CDA) is a structured format for exchanging clinical data. A producer of information (a content creator) follows a series of rules (called templates) to construct an XML document which can be displayed or semantically interpreted by a recipient (or a content consumer). CDA is based in an early version of the HL7v3 standard, and shares many terms and concepts with HL7 Version 3.

A CDA document is logically structured as illustrated in Figure 1, and consists of four major types of elements.

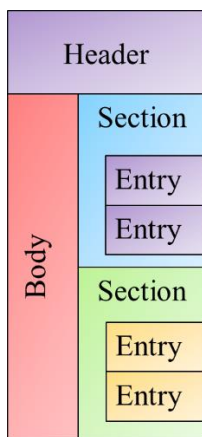


Figure 1 - Logical View of a CDA Document

- **Header:** Which contains data related to the document such as the subject (patient whose data is represented within the body), author, data enterer, custodian (original location of data), etc.
- **Body:** Which contains the content of the document. This content can be structured (as a structuredBody) or unstructured (as a nonXmlBody)
- **Sections:** Which represent major organizations of data such as advance directives, problems, allergies, medications, etc. These sections may or may not contain discrete data elements, however they must contain text which can be used by consumers to render content which they cannot semantically interpret.
- **Entries:** Which represent either a single data point (such as an observation, procedure, encounter, etc.) or logical grouping of data points (such as a battery, or medication regimen).

Additionally, CDA consists of three levels of conformance which describes the level of detail or semantic data contained within the document, they are as follows:

- **Level 1:** A level 1 CDA document consists of a structured header and an unstructured body. A Level 1 CDA document may convey PDF, RTF, HTML or proprietary other content which cannot be encoded by the content creator.
- **Level 2:** A level 2 CDA document consists of a structured header, and a structured body having codified sections. Sections carry a textual representation of the clinical data stored in the content creator classified by a code.
- **Level 3:** A level 3 CDA document consists of a structured header, a structured body having codified sections which are comprised of discrete data contained within entries. These entries contain data which can be semantically understood by the recipient of the document.

Level 3 is represents an extension of a Level 2 document and they are often interchangeable. For example, a consumer which only understands CDA at Level 2 (section import) can store a Level 3 document, conversely a consumer which implements Level 3 (discrete import) can still interpret a Level 2 document. Additionally some document templates will represent a mixture of level 2 and level 3 content, or may give the implementer a choice of using a level 2 section or a codified level 3 section.

### 1.3. Clinical Documents in OpenSHR

OpenSHR acts as a content consumer of CDA documents as well as a content creator.

When consuming a CDA, OpenSHR will determine the conformance level of the document (Level 1, 2, or 3) and will take the appropriate action.

- If the document is Level 1 (has unstructured data), OpenSHR will import the header elements contained in the document, and will store the document content (the binary data) as a complex observation within the OpenMRS datastore.
- If the document is Level 2 or 3, OpenSHR will iterate through the document sections. The software makes a decision for each section whether or not the section can be interpreted reliably as Level 3, if so observations, orders, and active list items (problems, allergies, etc.) are imported into OpenMRS, otherwise, the section text is stored.

When creating a CDA, OpenSHR will gather information about the intended patient from its datastore and will create an appropriate CDA for that patient. What is “appropriate” depends on the type of data being generated. For example, OpenSHR may determine that because all previous Vital Signs observations were submitted at level 3 it will generate Vital Signs for the patient within the summary as Level 3, however an Allergies section will use only codified allergies if present.

### 1.4. Third Party Toolkits

The OpenSHR implementation of CDA relies on several third party software components to assist in the import of document data.

#### 1.4.1. OpenMRS

OpenSHR is implemented as a series of OpenMRS modules which is used as the persistence store and application container. OpenMRS is licensed under the OpenMRS License and can be acquired from <http://openmrs.org>.

#### 1.4.2. MARC-HI Everest Framework 1.1.0

The CDA content consumer and on-demand documents modules use the MARC-HI Everest Framework version 1.1.0 to parse and construct CDA instances. This framework is licensed under the Apache 2.0 license and can be acquired from <http://everest.marc-hi.ca>.

#### 1.4.3. DCM4CHE

The XDS and on-demand documents modules use the DCM4CHE XDS components to facilitate the XDS and ATNA implementations within OpenSHR. This framework is licensed under the Mozilla Public License and can be acquired from <http://www.dcm4che.org/>.

## 2. Interfacing with OpenSHR

As introduced, interfacing with OpenSHR is done via IHE XDS transactions. These transactions are outlined in detail in the IHE Technical Framework Volume 2. This section seeks to provide a brief overview of how the OpenSHR implementation of XDS works.

### 2.1. Introduction

Introduce the XDS module

### 2.2. Sending Documents to OpenSHR

Describe the PNR operation, pointing to IHE documentation.

### 2.3. Retrieving Documents from OpenSHR

Describe the retrieve documents transaction pointing to IHE documentation. Describe what an On-Demand Document “looks like”.

### 2.4. XDS Meta-Data Binding

Where possible, the transport will use the XDS-MS bindings to XDS for the transport of CDAs. These bindings are included here for reference

#### 2.4.1. Author Person

The authorPerson meta-data element will be populated with the following XPath:

Let \$person = /ClinicalDocument/author

```
concat($person/id/@extension,"^",$person/assignedPerson/name/family,"^",$person/assignedPerson/name/given[1],"^",$person/assignedPerson/name/given[2],"^",$person/assignedPerson/name/suffix,"^",$person/assignedPerson/name/prefix,"^","^^^&", $person/id/@root,"&ISO")
```

Example:

```
<rim:Slot name="authorPerson">
  <rim:ValueList>
<rim:Value>123^Smith^John^^^^^&1.3.6.1.4.1.33349.3.1.2.2.0.0</rim:Value>
  </rim:ValueList>
</rim:Slot>
```

#### 2.4.2. Author Institution

The authorInstitution meta-data element will be populated with the following XPath

Let \$inst = /ClinicalDocument/author/assignedAuthor/representedOrganization

```
concat($inst/name)
```

#### 2.4.3. Class Code

The PCC XDS bindings indicate that classCode shall be derived from a map of /ClinicalDocument/code/@code to a LOINC “Type of Service” code. The class code will depend on the nature of the service. The following are potential codes for use in this meta-data field.



Code	Scheme	Name	Document Types
34117-2	LOINC	HISTORY AND PHYSICAL	Antepartum History and Physical
57055-6	LOINC	ANTEPARTUM SUMMARY NOTE	Antepartum Summary Note
11369-6	LOINC	HISTORY OF IMMUNIZATIONS	Immunization Content
34133-9	LOINC	SUMMARIZATION OF EPISODE NOTE	CCD

#### 2.4.4. Creation Time

The creationTime meta-data element will map to the following XPath:

```
/ClinicalDocument/effectiveTime
```

#### 2.4.5. Format Code

IHE XD\* permits the use of custom affinity domain specific format codes for documents not adhering to IHE content profiles. Outlines the codes currently supported by OpenSHR.

FormatCode	Scheme	Document Template
urn:ihe:pcc:aphp:2008	1.3.6.1.4.1.19376.1.2.3	Antepartum History and Physical
urn:ihe:pcc:aps:2007	1.3.6.1.4.1.19376.1.2.3	Antepartum Summary
urn:ad:ohie:ccd+:2014	1.3.6.1.4.1.19376.1.2.3	CCD+
urn:ihe:pcc:ic:2009	1.3.6.1.4.1.19376.1.2.3	Immunization Content
2.16.840.1.113883.10.20.1	HL7	CCD

Example:

```
<rim:Classification id="cl04" classificationScheme="urn:uuid:a09d5840-386c-46f2-b5ad-9c3699a4309d" classifiedObject="Document01" nodeRepresentation="urn:ihe:pcc:aps:2007">
  <rim:Slot name="codingScheme">
    <rim:ValueList>
      <rim:Value>1.3.6.1.4.1.19376.1.2.3</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Name>
    <rim:LocalizedString value="Antepartum Summary"/>
  </rim:Name>
</rim:Classification>
```

#### 2.4.6. Healthcare Facility Type

The healthcareFacilityTypeCode will be statically configured in by the content creator and will be consistent with the value placed in the payload. These values are expected to be drawn from the default connect-a-thon healthcareFacilityTypeCodes with the following exception is may not be populated.

#### 2.4.7. Language Code

The languageCode will be fixed to the following XPath:

```
/ClinicalDocument/languageCode
```

#### 2.4.8. Mime Type

The mime-type will be fixed to “text/xml” for CDA documents.

#### 2.4.9. Patient Id

The patient identifier is to be populated with the affinity domain patient identifier in the case of XDS, or an identifier known to the recipient in the case of XDR. This is in the format ID^^^&AD\_OID&ISO. The source is expected to obtain this identifier by executing an appropriate PIX or PDQ transaction if it is not known.

Example:

```
<rim:ExternalIdentifier id="ei01" registryObject="Document01"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427"
value="70^^^&1.3.6.1.4.1.33349.3.1.2.2.0.0&ISO">
  <rim:Name>
    <rim:LocalizedString value="XSDocumentEntry.patientId"/>
  </rim:Name>
</rim:ExternalIdentifier>
```

#### 2.4.10. Practice Setting Code

The practice setting code will be drawn from LOINC’s Subject Matter Domain code list.

#### 2.4.11. Service Start Time & Service Stop Time

The service start / stop times are drawn from the following XPaths respectively:

```
/ClinicalDocument/documentationOf/serviceEvent/effectiveTime/low/@value
/ClinicalDocument/documentationOf/serviceEvent/effectiveTime/high/@value
```

#### 2.4.12. Source Patient Identifier

The sourcePatientId slot data is copied from the source CDA document via the following XPath:

Let \$patId = /ClinicalDocument/recordTarget/patientRole/id

```
concat($patId/@extension, “^^^&”, $patId/@root, “&ISO”)
```

Example:

```
<rim:Slot name="sourcePatientId">
  <rim:ValueList>
    <rim:Value>7032^^^&1.3.6.1.4.1.33349.3.1.3.201203.2.1.1.0&ISO</rim:Value>
  </rim:ValueList>
</rim:Slot>
```

#### 2.4.13. Source Patient Information

The sourcePatientInfo slot is expected to be populated from the information found in /ClinicalDocument/recordTarget/patientRole element.

Example:

```
<rim:Slot name="sourcePatientInfo">
  <rim:ValueList>
    <rim:Value>PID-
3|7032^^^&1.3.6.1.4.1.33349.3.1.2.2.1.1.0&ISO</rim:Value>
    <rim:Value>PID-5|Walter^William^^^</rim:Value>
    <rim:Value>PID-7|19530522</rim:Value>
    <rim:Value>PID-8|M</rim:Value>
  </rim:ValueList>
</rim:Slot>
```

#### 2.4.14. Title

The title meta-data element is to be derived from the following XPath:

```
/ClinicalDocument/title/text()
```

#### 2.4.15. Type Code

The type code will be consistent with the LOINC document type code used in the CDA. The xpath to populate this element is

```
/ClinicalDocument/code/@code
```

Example:

```
<rim:Classification id="c107" classificationScheme="urn:uuid:f0306f51-975f-434e-a61c-
c59651d33983" classifiedObject="Document01" nodeRepresentation="34133-9">
  <rim:Slot name="codingScheme">
    <rim:ValueList>
      <rim:Value>LOINC</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Name>
    <rim:LocalizedString value="Summary of Episode Note"/>
  </rim:Name>
</rim:Classification>
```

#### 2.4.16. Unique Id

The globally unique identifier for the document as described in the id field of the document. This attribute will be populated using the following XPath:

Let \$docID = /ClinicalDocument/id

```
concat($docID/@root, "", $docID/@extension)
```

## 2.5. Submission Sets

When sending documents to the OpenSHR, the document source will submit one document as a member of one submission set. The submission set meta-data is described in this section.

### 2.5.1. Patient Id

The patient identifier is to be populated with the affinity domain patient identifier in the case of XDS, or an identifier known to the recipient in the case of XDR. This is in the format ID^^^&AD\_OID&ISO. The source is expected to obtain this identifier by executing an appropriate PIX or PDQ transaction if it is not known.

Example:

```
<rim:ExternalIdentifier id="ei01" registryObject="Document01"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427"
value="70^^^&1.3.6.1.4.1.33349.3.1.2.2.0&ISO">
  <rim:Name>
    <rim:LocalizedString value="XDSSubmissionSet.patientId"/>
  </rim:Name>
</rim:ExternalIdentifier>
```

### 2.5.2. SourceId

The identifier of the submission set as known by the sender.

```
<rim:ExternalIdentifier id="ei04" registryObject="SubmissionSet01"
identificationScheme="urn:uuid:6b5aea1a-874d-4603-a4bc-96a0a7b38446" value="3670984664">
  <rim:Name>
    <rim:LocalizedString value="XDSSubmissionSet.sourceId"/>
  </rim:Name>
</rim:ExternalIdentifier>
```

### 2.5.3. Unique Id

The globally unique identifier for the submission set. This identifier will be generated by the source in the form of an OID. This will relate to a value specified as "OID\_OF\_SENDER.ID\_OF\_SUBMISSION\_SET".

Example:

```
<rim:ExternalIdentifier id="ei03" registryObject="SubmissionSet01"
identificationScheme="urn:uuid:96fdda7c-d067-4183-912e-bf5ee74998a8"
value="urn:oid:1.3.6.1.4.1.21367.2005.3.9999.3433232321">
  <rim:Name>
    <rim:LocalizedString value="XDSSubmissionSet.uniqueId"/>
  </rim:Name>
</rim:ExternalIdentifier>
```

### 3. Clinical Document Implementation

A CDA document is import section by section, entry by entry. This section seeks to describe the document, section and entry templates which have been explicitly implemented by OpenSHR for either import or export.

#### 3.1. General Implementation Notes

##### 3.1.1. Identifiers

Identifiers within a CDA document are of paramount importance, as they are used to track the document, section, and entries as they are management within the OpenSHR data model. OpenSHR will always assign identifiers to any piece of data contained within its data store and will share these identifiers via any on-demand document exported.

Implementers (content creators and consumers) are expected to maintain at least one of the identifiers provided to them for each piece of data that they convey to the SHR. If OpenSHR does not receive an identifier for a piece of data then it will always result in a “create” operation (i.e. it is impossible to update data without an identifier).

Identifiers are expressed using the II data type and can be represented in one of several ways illustrated in Table 1.

Table 1 - Representation of identifiers

Identifier	Semantic Meaning
<code>&lt;id root="1.3.6.1.4.1.19376.1.5.3.1.4.13.7"/&gt;</code>	The identifier is globally unique based on the OID provided in the “root” attribute.
<code>&lt;id root="1.2.3.4.5.6.9.100.1" extension="2-20141028095457"/&gt;</code>	The identifier 2-2014102895457 is unique within the identity domain 1.2.3.4.5.6.9.100.1.
<code>&lt;id root="fcab9618-943d-4368-a0f6-4d27727889af"/&gt;</code>	The identifier <uuid> is globally unique, or had no identifier/domain and a random identifier was assigned

The preferred method of representing identifiers is using the root/extension method as it more easily identifies the domain which assigned the identifier. For example, a content creator may have a “patients” table with an incrementing primary key. It would be possible for that content creator to assign an OID to the “patients” table and use the primary key as the extension of that identifier.

##### 3.1.2. Codified Data

Within a CDA there are many opportunities to represent codified data. Many times local implementations will store codes using a canonical (or application specific) concept identifier. In OpenMRS terms, this represents the concept identifier in the OpenMRS concept dictionary.

When communication with OpenSHR via CDA it is important the content consumers translate their internal representation to a code which lies in the valid set of codes listed in the particular element (such as section code, entry value, etc.).

When communicating with OpenSHR it is recommended that content creators use the recommended valueset / code binding as the primary code, and supply their local “original” code as well. Figure 1 illustrates a coded value identifying how codified values should be represented in a CDA.

Figure 1 - Coding specification

```
<code code="STANDARDIZED CODE MNEMONIC"
      codeSystem="OID OF THE STANDARDIZED CODE SYSTEM"
      codeSystemName="(OPTIONAL) NAME OF THE CODE SYSTEM"
      displayName="(OPTIONAL) DISPLAY TEXT FOR THE CODE">
  <!-- Optional Original Text : Can point to the section text
  where the original text for the concept (as displayed
  in the user interface to the user) is located-->
  <originalText>
    <reference value="#codeText"/>
  </originalText>
  <!-- 0..n Translations to equivalent concepts -->
  <translation code="LOCAL CODE MNEMONIC"
              codeSystem="OID OF THE LOCAL CODE SYSTEM"
              codeSystemName="(OPTIONAL) NAME OF THE CODE SYSTEM"
              displayName="(OPTIONAL) DISPLAY TEXT FOR THE CODE"/>
</code>
```

Figure 2 illustrates a Drug (penicillin) represented as RxNORM (the recommended code system) as well as MVP/CIEL and SNOMED.

Figure 2 - Example coding of Penicillin

```
<code code="70618" codeSystem="2.16.840.1.113883.6.88" codeSystemName="RxNORM"
      displayName="Penicillin">
  <originalText representation="TXT" language="en-US">
    <reference value="#txtc787b6fe"/>
  </originalText>
  <translation code="81724" codeSystem="9.9.9.9.9.9" codeSystemName="CIEL"/>
  <translation code="373270004" codeSystem="2.16.840.1.113883.6.96"
              codeSystemName="SNOMED CT"/>
  <translation code="6369005" codeSystem="2.16.840.1.113883.6.96"
              codeSystemName="SNOMED CT"/>
</code>
```

Sometimes it is necessary to represent a piece of data whereby no mapping exists between the local system’s concepts and OpenSHR’s preferred terminology. In this case it is recommended to represent the code as a nullFlavor of “OTH”. Figure 3 illustrates a case where no standardized code exists for Myocardial Infarction in SNOMED (perhaps the system does not have mappings to SNOMED), however there exists a map to MVP/CIEL.

Figure 3 - Example coding where standardized codes are not available

```
<value nullFlavor="OTH" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT">
  <originalText representation="TXT" language="en-US">
    <reference value="#txtd217167a"/>
  </originalText>
  <translation code="115432" codeSystem="9.9.9.9.9.9" codeSystemName="CIEL"
              displayName="Myocardial Infarction"/>
  <translation code="MIARCH" codeSystem="8.8.8.8.8.8" codeSystemName="LOCAL"
              displayName="Myocardial Infarction"/>
</value>
```

</value>

CDA further supports another representation of nullFlavor of “OTH” and only OriginalText being provided, however due to requirements of OpenSHR’s data model this representation of codes is not permitted.

### 3.1.2.1. Code Systems

OpenSHR will map codified data using the OpenMRS ReferenceTerm (or wire level codes). OpenSHR will attempt to map the ConceptSource’s HL7 name to an OID (if it is in the list) or expects the ConceptSource’s HL7 name to be an OID itself.

There is significant performance gains within OpenSHR when pre-loading all reference terms before processing CDAs and turning off the autoCreateConcepts flag in the OpenSHR configuration.

Table 2 provides an outline the code systems which come pre-installed with the OpenSHR CDA handler. It is important to note that this is not a fixed list and can be localized.

Table 2 - Code Systems used by OpenSHR

Code System Name	OpenMRS HL7 Name	OID
LOINC	LOINC	2.16.840.1.113883.6.1
SNOMED CT	SNOMED CT	2.16.840.1.113883.6.96
HL7 ActCode		2.16.840.1.113883.5.4
HL7 Severity Observation		2.16.840.1.113883.5.1063
HL7 Observation Interpretation		2.16.840.1.113883.5.83
HL7 Role Code		2.16.840.1.113883.5.111
HL7v3 Route of Administration		2.16.840.1.113883.5.112
HL7 Act Status		2.16.840.1.113883.5.14
HL7 Marital Status		2.16.840.1.113883.5.2
HL7 Act Mood		2.16.840.1.113883.5.1001
CPT4		2.16.840.1.113883.6.12
HL7 CVX (Vaccine Codes)	HL7 CVX	2.16.840.1.113883.6.59
WHO ICD-10	ICD-10-WHO	2.16.840.1.113883.6.3
RxNORM (Drug Codes)	RxNORM	2.16.840.1.113883.6.88
MVP/CIEL	CIEL	9.9.9.9.9.9 (Temporary)

### 3.1.3. Representation of Time

In a CDA times can be represented in a variety of manners. In general three data-types are used to describe a “time” they are:

- TS which describes an instant in time or simple range of time
- IVL which describes an interval of time
- GTS which describes a time specification

GTS is typically used to represent drug dosing frequencies and is described more in “Medications” on page 35.

### 3.1.3.1. Representing an Instant in Time

Representing an instant in time is performed by using the “value” attribute of a TS or IVL datatype. Instants in time are represented as a variable precision HL7 time type in the format yyyyMMddHHmms.ffffZ. Table 3 provides some examples of how to represent an instant in time and how OpenSHR will interpret the time.

Table 3 - Interpretation of time

Example	OpenSHR Interpretation
<code>&lt;effectiveTime value="20141028012332.0429-0200"/&gt;</code>	Occurs exactly at 01:23:32 and 429ms on October 28, 2014 GMT-2:00
<code>&lt;effectiveTime value="20141028012332.0249"/&gt;</code>	Occurs exactly at 01:23:32 and 249ms on October 28, 2014 GMT-0:00
<code>&lt;effectiveTime value="20141028012332-0200"/&gt;</code>	Occurs at 01:23:32 on October 28, 2014 GMT-2:00
<code>&lt;effectiveTime value="201410280123-0200"/&gt;</code>	Occurs sometime during 01:23 on October 28,2014 GMT-2:00
<code>&lt;effectiveTime value="2014102801-0200"/&gt;</code>	Occurs sometime between 01:00 and 01:59:59 on October 28, 2014 GMT-2:00
<code>&lt;effectiveTime value="20141028"/&gt;</code>	Occurs sometime on October 28, 2014
<code>&lt;effectiveTime value="201410"/&gt;</code>	Occurs sometime in October 2014
<code>&lt;effectiveTime value="2014"/&gt;</code>	Occurs sometime in 2014

### 3.1.3.2. Representing a period of Time

Intervals of various forms (IVL, PIVL, EIVL) are used to express and interval or range of time. Table 4 provides examples of how to represent intervals of time and how OpenSHR will interpret that range of time.

Table 4 - Intervals of time

Example	OpenSHR Interpretation
<code>&lt;effectiveTime&gt;   &lt;low value="20140402"/&gt;   &lt;high value="20150101"/&gt; &lt;/effectiveTime&gt;</code>	Starting April 02, 2014 and ending January 01, 2015
<code>&lt;effectiveTime&gt;   &lt;low value="20140402"/&gt; &lt;/effectiveTime&gt;</code>	Starting on April 02, 2014 and has not ended, will not end (until infinity)
<code>&lt;effectiveTime&gt;   &lt;high value="20150101"/&gt; &lt;/effectiveTime&gt;</code>	Ending January 01, 2015, unknown start date or always occurring (start date of infinity)
<code>&lt;effectiveTime&gt;   &lt;low value="2014"/&gt; &lt;/effectiveTime&gt;</code>	Started sometime in 2014
<code>&lt;effectiveTime&gt;   &lt;high value="2015"/&gt; &lt;/effectiveTime&gt;</code>	Ending sometime in 2015



**Note:** Because of limitations imposed on OpenMRS' data-model, when sending intervals to OpenSHR both the low and high values must have the same precision. In the case of different date precisions used, OpenSHR will use the lowest precision of the two.

## 3.2. CDA Document Implementation

This section describes the implementation notes related to CDA documents.

### 3.2.1. Document Implementation Details

#### 3.2.1.1. Replacing / Appending Documents

There may occur times when a content creator wishes to obsolete all data in a previously sent clinical document and replace the content with new data or may wish to append an existing document with new data. When this occurs the content consumer is expected to create a replacement relationship between the two documents.

Figure 4 illustrates an example of how a replacement should be performed. The example instructs OpenSHR to replace the contents of document 1.2.3.1.2.3.4.3.234 with the contents in the current document instance.

Figure 4 - Replacing a document

```
<ClinicalDocument classCode="DOCCLIN" moodCode="EVN" xmlns="urn:h17-org:v3">
  ...
  <relatedDocument typeCode="RPLC">
    <parentDocument classCode="DOCCLIN" moodCode="EVN">
      <id root="1.2.3.1.2.3.4.3" extension="234" />
    </parentDocument>
  </relatedDocument>
  ...
</ClinicalDocument>
```

If a document were submitted to OpenSHR with this element, the SHR would attempt to load the specified document identifier, obsolete all data related to that document, and would then store the new data.

**Note:** This reference can only be used to reference a stable CDA document that was submitted to the OpenSHR instance. The OpenSHR cannot replace or amend an on-demand document or non-CDA document.

#### 3.2.1.2. Authors

CDA documents may have one or more authors associated with the document. Author nodes are intended to represent all of the persons or devices who were involved in the creation of data contained within the clinical document.

OpenSHR stores local information related to each author obtained from inbound CDA documents and will merge new information (identifiers, names, etc.) based on the content contained within the CDA. It is recommended that the shr-cdahandler.epidRoot configuration value be configured to point to an enterprise provider identifier OID. This will allow the SHR to select an appropriate provider record in its local data store with which to associate data.

Figure 5 identifies the minimum requirements for an author being imported by OpenSHR.

Figure 5 - Specification of Author

```
<author typeCode="AUT" contextControlCode="OP">
  <!-- 1..1 time - Indicating the time the author was involved -->
  <time value=""/>
  <!-- 1..1 assignedAuthor relationship -->
  <assignedAuthor classCode="ASSIGNED">
    <!-- 1..n id elements identifying the author -->
    <id root="" extension=""/>
    <!-- 0..n addr elements identifying the contact location of the author -->
    <addr/>
    <!-- 0..n telecom elements identifying the contact telecom address -->
    <telecom value=""/>
    <!-- 1..1 assignedPerson relationship -->
    <assignedPerson classCode="PSN" determinerCode="INSTANCE">
      <!-- 1..n name -->
      <name/>
    </assignedPerson>
    <!-- 0..1 representedOrganization relationship -->
    <representedOrganization classCode="ORG" determinerCode="INSTANCE">
      <!-- 1..1 id elements identifying the organization -->
      <id root="" extension=""/>
      <!-- 1..1 name element identifying the name of the organization -->
      <name/>
      <!-- 0..1 telecom element identifying telecommunications addresses for the org-->
      <telecom/>
      <!-- 0..1 address element identifying the physical address of the org -->
      <addr/>
    </representedOrganization>
  </assignedAuthor>
</author>
```

When importing the author nodes of a CDA document, the OpenSHR module will create an OpenMRS Provider record and a User. In order to facilitate the storage of necessary contact information related to the assigned entities within a document, the OpenSHR CDA modules will use the person and provider attributes identified in Table 5.

Table 5 - Person Attribute Types

Attribute	Data Type	Description
Person.Organization	Organization	Stores the <representedOrganization> related data.
Person.Telecom	String	Stores the <telecom> data

Figure 6 illustrates a Clinical Document that was authored by Dr. Julius Hibbert of Springfield General Hospital.

Figure 6 - Sample Author

```
<author typeCode="AUT" contextControlCode="OP">
  <time value="20150103"/>
  <assignedAuthor classCode="ASSIGNED">
    <id root="1.2.3.4.5.6.7" extension="234"/>
  </assignedAuthor>
</author>
```

```

<id root="1.2.3.4.5.7" extension="7"/>
<id root="1.2.3.4.5.10" extension="508"/>
<addr nullFlavor="NI"/>
<telecom value="null"/>
<assignedPerson classCode="PSN" determinerCode="INSTANCE">
  <name>
    <family>Hibbert</family>
    <given>Julius</given>
  </name>
</assignedPerson>
<representedOrganization classCode="ORG" determinerCode="INSTANCE">
  <id root="1.2.3.4.5.8" extension="9"/>
  <name>Springfield General Hospital</name>
  <telecom nullFlavor="NI"/>
  <addr nullFlavor="NI"/>
</representedOrganization>
</assignedAuthor>
</author>

```

Additionally, some information within a CDA may not be authored by a human, but may be data created by a machine (for example: to fulfill some form of constraints, or to illustrate “unknown” data). In this case the author will contain an assignedAuthorDevice with the device software name and version. Figure 7 provides an example of authorship for information that is generated by OpenSHR. Note that support for device authors is currently limited in OpenSHR.

Figure 7 - Sample author by device

```

<author typeCode="AUT">
  <time value="20150103202926.988-0500"/>
  <assignedAuthor classCode="ASSIGNED">
    <id root="1.2.3.4.3.2.3.4"/>
    <addr nullFlavor="NI"/>
    <telecom nullFlavor="NI"/>
    <assignedAuthoringDevice classCode="DEV" determinerCode="INSTANCE">
      <manufacturerModelName language="en-US">1.10.0 Build
d8b5d0</manufacturerModelName>
      <softwareName language="en-US">OpenSHR</softwareName>
    </assignedAuthoringDevice>
  </assignedAuthor>
</author>

```

### 3.2.1.3. Record Target

The recordTarget element of a CDA document is used to express the subject of care to which the data contained within the CDA applies. CDA allows for multiple recordTarget elements to be assigned to a single document, however OpenSHR only supports the recordTarget element as a 1..1 relationship.

Figure 8 provides a specification of the recordTarget element to be used for sending data to OpenSHR. OpenSHR will scan the list of identifiers related to the patients and will attempt to match the identifiers with those contained in existing patients currently stored. It is recommended to set the shr-cdahandler.cidRoot property to point to the jurisdictions enterprise client identifier OID, so that the SHR can appropriately match patients within a CDA document with those in the datastore.

Figure 8 - Specification for recordTarget

```

<recordTarget typeCode="RCT" contextControlCode="OP">
  <!-- 1..1 patientRole elements -->
  <patientRole classCode="PAT">
    <!-- 1..n id elements identifying the patient -->
    <id root="" extension=""/>
    <!-- 0..n addr elements representing patient addresses -->
    <addr/>
    <!-- 0..n telecom elements representing patient telecom addresses -->
    <telecom value=""/>
    <!-- 1..1 patient association -->
    <patient classCode="PSN" determinerCode="INSTANCE">
      <!-- 0..1 name representing the name of the patient -->
      <name/>
      <!-- 1..1 gender representing the gender of the patient -->
      <administrativeGenderCode code="M|F|UN" codeSystem="2.16.840.1.113883.5.1"
codeSystemName="AdministrativeGender"/>
      <!-- 0..1 birthTime representing the date of birth (or approximate) -->
      <birthTime value=""/>
    </patient>
  </patientRole>
</recordTarget>

```

#### 3.2.1.4. Participants / Next of Kin

When authoring a document, there are often requirements to express people who are related to, but not directly the target of care. There may also be need to store information about providers who were involved in the care act but not necessarily an author, or informant.

In CDA, such persons are represented as a series of participant relationships within the header. Participant elements within the CDA header should match the production outlined in Figure 9.

Figure 9 - Specification for next of kin and participants

```

<participant typeCode="IND">
  <associatedEntity classCode="NOK">
    <!-- 1..1 code identifying the relationship drawn from table -->
    <code code="" displayName=" "
          codeSystem="" codeSystemName=" " />
    <!-- 0..n addr elements identifying the participants address -->
    <addr/>
    <!-- 0..n telecom elements identifying the telecom addresses -->
    <telecom/>
    <!-- 1..1 assignedPerson relationships -->
    <associatedPerson>
      <!-- 1..n name elements representing the names of the participant -->
      <name/>
    </associatedPerson>
  </associatedEntity>
</participant>

```

The relationship codes identified map to OpenMRS PersonRelationship types and should be drawn from Table 6.

Table 6 - Family member codes

Code	Code System	Relationship
127848009	SNOMED CT	Patient's domestic partner

FAMMEMB	HL7 RoleCode	Family member
MTH	HL7 RoleCode	Mother
FTH	HL7 RoleCode	Father
GRMTH	HL7 RoleCode	Grandmother
GRFTH	HL7 RoleCode	Grandfather
SIB	HL7 RoleCode	Sibling
CHILD	HL7 RoleCode	Child
DOMPART	HL7 RoleCode	Domestic partner (equivalent to 127848009)

### 3.2.1.4.1. Natural Father of Fetus

To represent a natural father of the fetus, the participant node shall match the production identified in Figure 10.

Figure 10 - Specification for natural father of fetus

```
<participant typeCode="IND">
  <associatedEntity classCode="NOK">
    <!-- 1..1 code indicating the relationship shall be x-fatherofbaby -->
    <code code="xx-fatherofbaby" displayName="Father of Baby"
          codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT" />
    <!-- 0..n addr elements representing the address of the participant -->
    <addr/>
    <!-- 0..n telecom elements representing the telecommunications addresses -->
    <telecom/>
    <!-- 1..1 associatedPerson relationships identifying the person -->
    <associatedPerson>
      <!-- 1..n names of the participant person -->
      <name/>
    </associatedPerson>
  </associatedEntity>
</participant>
```

For example, a document which identifies “Mr.Charles Smith” as the natural father of the fetus within an Antepartum History and Physical document would do so as identified in Figure 11.

Figure 11 - Sample natural father of fetus data

```
<participant typeCode="IND">
  <associatedEntity classCode="NOK">
    <code code="xx-fatherofbaby" displayName="Father of Baby"
          codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT" />
    <addr>
      <streetAddressLine>18 Oak Valley Dr.</streetAddressLine>
      <city>Monteagle</city>
      <state>TN</state>
      <postalCode>37205</postalCode>
      <country>USA</country>
    </addr>
    <telecom value="tel:(999)555-1212" use="WP" />
    <associatedPerson>
      <name>
        <prefix>Mr.</prefix>
        <given>Charles</given>
      </name>
    </associatedPerson>
  </associatedEntity>
</participant>
```

```

        <family>Smith</family>
    </name>
</associatedPerson>
</associatedEntity>
</participant>

```

#### 3.2.1.4.2. Spouse

For example, a document which identifies “Mr. John Smith” as the spouse of the record target would do so as illustrated in Figure 12.

Figure 12 - Sample spouse template data

```

<participant typeCode="IND">
  <associatedEntity classCode="NOK">
    <code code="127848009" displayName="patient's domestic partner"
      codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT" />
    <addr>
      <streetAddressLine>45 Chunn Dr.</streetAddressLine>
      <city>Spring Hill</city>
      <state>TN</state>
      <postalCode>37174</postalCode>
      <country>USA</country>
    </addr>
    <telecom value="tel:(999)555-1212" use="WP" />
    <associatedPerson>
      <name>
        <prefix>Mr.</prefix>
        <given>John</given>
        <family>Smith</family>
      </name>
    </associatedPerson>
  </associatedEntity>
</participant>

```

#### 3.2.1.5. Custodianship

Clinical documents represented in CDA must carry an indication of custodianship. The custodian of a document represents the device or organization where the original copy of the document is stored and is used for data provenance. Figure 13 provides an example of a custodian node for a local clinical named “Good Health Clinic”.

Figure 13 - Sample custodianship data

```

<custodian typeCode="CST">
  <assignedCustodian classCode="ASSIGNED">
    <representedCustodianOrganization classCode="ORG" determinerCode="INSTANCE">
      <id root="1.2.3.4.5.6.9.8" extension="1"/>
      <name>Good Health Clinic</name>
      <telecom nullFlavor="NI"/>
      <addr nullFlavor="NI"/>
    </representedCustodianOrganization>
  </assignedCustodian>
</custodian>

```

This rule applies to the OpenSHR on-demand document modules as well. Whenever an instance of OpenSHR composes an on-demand document it will represent itself as not only an author, but as the custodian of the data as well.

### 3.2.2. Implemented Document Templates

CDA document templates establish a list of rules, and constraints on a clinical document. CDA document templates dictate what fields appear in the header, as well as which sections are present in the document. The document templates listed here are taken from IHE and HL7 and described to illustrate any further constraints or implementation notes imposed by OpenSHR.

Note that OpenSHR’s CDA import code has the ability to import any document at level 1 or level 2 (depending on the source document’s conformance). This section merely lists the templates which are explicitly identified by the CDA import module.

#### 3.2.2.1. Antepartum Summary (APS)

Template ID	1.3.6.1.4.1.19376.1.5.3.1.1.11.2	
Reference(s)	IHE PCC Antepartum Care Supplement 6.3.1.B.3	
Base Template (IS-A)	Medical Summary Document	
Document Code	LOINC: 57055-6 (ANTEPARTUM SUMMARY NOTE)	
XDS Format Code	IHE Format Code: urn:ihe:pcc:aps:2007	
XDS Type Code	LOINC: 57055-6	
Description	<p>The APS document template is used to summarize the care provided during the course of a pregnancy. This document is a summary and contains information related to the episode of pregnancy.</p> <p>An APS typically represents a “living document” meaning that the content of an APS will change during the progression of pregnancy.</p>	
Expected Sections		
Section	Template ID	Reference
Estimated Delivery Dates	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.1	3.3.2.8
Visit Summary Flow sheet	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.2	3.3.2.5
History of Surgical Procedures	1.3.6.1.4.1.19376.1.5.3.1.1.16.2.2	
Coded Antenatal Testing and Surveillance	1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5.1	3.3.2.4
Allergies and Other Adverse Reactions	1.3.6.1.4.1.19376.1.5.3.1.3.13	3.3.2.3
Medications	1.3.6.1.4.1.19376.1.5.3.1.3.19	3.3.2.12
Care Plan	1.3.6.1.4.1.19376.1.5.3.1.3.31	
Advance Directives	1.3.6.1.4.1.19376.1.5.3.1.3.34 or 1.3.6.1.4.1.19376.1.5.3.1.3.35	3.3.2.2
Problems	1.3.6.1.4.1.19376.1.5.3.1.3.6	3.3.2.1
Vital Signs	1.3.6.1.4.1.19376.1.5.3.1.3.25 or 1.3.6.1.4.1.19376.1.5.3.1.1.5.3.2	3.3.2.17
OpenSHR Implementation Notes		

Additional Constraints	<ul style="list-style-type: none"> <li>• SHOULD have &lt;participant&gt; representing natural father of fetus (see: 3.2.1.4)</li> <li>• SHOULD have &lt;participant&gt; representing the domestic partner (see: 3.2.1.4)</li> </ul>
Notes	<p>All sections in this document are optional, however the document should, at minimum, contain the Vital Signs.</p> <p>Additionally when this document is generated as an On-Demand Document, OpenSHR will make assertions about the following conditions and allergies indicating “unknown”:</p> <ul style="list-style-type: none"> <li>• An allergy entry describing the patient’s allergy to Latex will be included in all ODD APS summaries generated by the SHR.</li> <li>• An advance directive related to acceptance of blood transfusion will be included in all ODD APS summaries generated by the SHR.</li> </ul>

Specification	
<pre> &lt;ClinicalDocument xmlns="urn:hl7-org:v3" xmlns:xsi="http://www.w3.org/2001/XMLSchema- instance" classCode="DOCCLIN" moodCode="EVN"&gt;   &lt;realmCode code="UV"/&gt;   &lt;typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.11.2"/&gt;   &lt;id root="1.2.3.4.5.6.9.100.2" extension="2-20141027135823"/&gt;   &lt;code code="57055-6" codeSystem="2.16.840.1.113883.6.1"     codeSystemName="LOINC" displayName="ANTEPARTUM SUMMARY NOTE"/&gt;   &lt;title language="en-US"&gt;ANTEPARTUM SUMMARY NOTE&lt;/title&gt;   &lt;effectiveTime value=""/&gt;   &lt;confidentialityCode code="" codeSystem="2.16.840.1.113883.5.25" codeSystemName="x_BasicConfidentialityKind"/&gt;   &lt;languageCode code=""/&gt;   &lt;!-- 1..1 Record Target --&gt;   &lt;recordTarget typeCode="RCT" contextControlCode="OP"&gt;     ...   &lt;/recordTarget&gt;   &lt;!-- 1..n Author Persons --&gt;   &lt;author typeCode="AUT" contextControlCode="OP"&gt;     &lt;time value=""/&gt;     ...   &lt;/author&gt;   &lt;!-- 1..1 Custodial Organization --&gt;   &lt;custodian typeCode="CST"&gt;     ...   &lt;/custodian&gt;   &lt;!-- 0..n Participants --&gt;   &lt;participant typeCode="IND"&gt;     &lt;time value=""/&gt;     &lt;associatedEntity classCode="PRS"&gt;       ...     &lt;/associatedEntity&gt;   &lt;/participant&gt;   &lt;!-- 1..n Documentation Of --&gt;   &lt;documentationOf typeCode="DOC"&gt;     &lt;serviceEvent classCode="PCPR" moodCode="EVN"&gt;       &lt;effectiveTime&gt;         &lt;low value=""/&gt; </pre>	



```

    <high value="" />
  </effectiveTime>
</serviceEvent>
</documentationOf>
<!-- 1..1 Component -->
<component typeCode="COMP" contextConductionInd="true">
  <!-- Must be structured body -->
  <structuredBody classCode="DOCBODY" moodCode="EVN">

    <!-- 1..n Components -->
    <component typeCode="COMP" contextConductionInd="true">
      <!-- 1..1 Section -->
      <section classCode="DOCSECT" moodCode="EVN">
        ...
      </section>
    </component>
  </structuredBody>
</component>
</ClinicalDocument>

```

3.2.2.2. Antepartum History and Physical (APHP)

Template ID	1.3.6.1.4.1.19376.1.5.3.1.1.16.1.1	
Reference(s)	IHE PCC Antepartum Care Supplement 6.3.1.A.3	
Base Template (IS-A)	History and Physical Document	
Document Code	LOINC: 34117-2 (HISTORY AND PHYSICAL)	
XDS Format Code	IHE Format Code: urn:ihe:pcc:aphp:2007	
XDS Type Code	LOINC: 34117-2	
Description	The APHP Document template is used to summarize the results of a particular antenatal care visit.	
Expected Sections		
Section	Template ID	Reference
Pregnancy History	1.3.6.1.4.1.19376.1.5.3.1.1.5.3.4	3.3.2.14
Detailed Physical Examination	1.3.6.1.4.1.19376.1.5.3.1.1.9.15 or 1.3.6.1.4.1.19376.1.5.3.1.1.9.15.1	3.3.2.13
Allergies and Other Adverse Reactions	1.3.6.1.4.1.19376.1.5.3.1.3.13	3.3.2.3
Family History	1.3.6.1.4.1.19376.1.5.3.1.3.14 or 1.3.6.1.4.1.19376.1.5.3.1.3.15	3.3.2.9
Social History	1.3.6.1.4.1.19376.1.5.3.1.3.16 or 1.3.6.1.4.1.19376.1.5.3.1.3.16.1	3.3.2.15
Review of Systems	1.3.6.1.4.1.19376.1.5.3.1.3.18	
Medications	1.3.6.1.4.1.19376.1.5.3.1.3.19	3.3.2.12
Vital Signs	1.3.6.1.4.1.19376.1.5.3.1.3.25 or 1.3.6.1.4.1.19376.1.5.3.1.1.5.3.2	3.3.2.17
Results	1.3.6.1.4.1.19376.1.5.3.1.3.27 or 1.3.6.1.4.1.19376.1.5.3.1.3.28	3.3.2.7
History of Present Illness	1.3.6.1.4.1.19376.1.5.3.1.3.4	
History of Past Illness	1.3.6.1.4.1.19376.1.5.3.1.3.8	3.3.2.10
OpenSHR Implementation Notes		

Additional Constraints	<ul style="list-style-type: none"> <li>• SHOULD have &lt;participant&gt; representing natural father of fetus (see: 3.2.1.4)</li> <li>• SHOULD have &lt;participant&gt; representing the domestic partner (see: 3.2.1.4)</li> </ul>
Notes	<ul style="list-style-type: none"> <li>• All sections in this document are optional, however the document should, at minimum, contain the Vital Signs</li> <li>• This document type is only supported for import</li> </ul>

#### Specification

```

<ClinicalDocument xmlns="urn:h17-org:v3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" classCode="DOCCLIN" moodCode="EVN">
  <realmCode code="UV"/>
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.16.1.1"/>
  <id root="1.2.3.4.5.6.9.100.2" extension="2-20141027135823"/>
  <code code="34117-2" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="HISTORY AND PHYSICAL"/>
  <title language="en-US">ANTEPARTUM HISTORY AND PHYSICAL</title>
  <effectiveTime value=""/>
  <confidentialityCode code="" codeSystem="2.16.840.1.113883.5.25"
codeSystemName="x_BasicConfidentialityKind"/>
  <languageCode code=""/>
  <!-- 1..1 Authors -->
  <recordTarget typeCode="RCT" contextControlCode="OP">
    <patientRole classCode="PAT">
      ...
    </patientRole>
  </recordTarget>
  <!-- 1..n Authors -->
  <author typeCode="AUT" contextControlCode="OP">
    <time value=""/>
    <assignedAuthor classCode="ASSIGNED">
      ...
    </assignedAuthor>
  </author>
  <!-- 1..1 Custodial Organization -->
  <custodian typeCode="CST">
    <assignedCustodian classCode="ASSIGNED">
      <representedCustodianOrganization classCode="ORG" determinerCode="INSTANCE">
        ...
      </representedCustodianOrganization>
    </assignedCustodian>
  </custodian>
  <!-- 0..n Participants -->
  <participant typeCode="IND">
    <time value=""/>
    <associatedEntity classCode="PRS">
      ...
    </associatedEntity>
  </participant>
  <!-- 1..n Documentation Of -->
  <documentationOf typeCode="DOC">
    <serviceEvent classCode="PCPR" moodCode="EVN">
      <effectiveTime>
        <low value=""/>
        <high value=""/>

```

```

    </effectiveTime>
  </serviceEvent>
</documentationOf>
<!-- 1..1 Component -->
<component typeCode="COMP" contextConductionInd="true">
  <!-- Must be structured body -->
  <structuredBody classCode="DOCBODY" moodCode="EVN">

    <!-- 1..n Components -->
    <component typeCode="COMP" contextConductionInd="true">
      <!-- 1..1 Section -->
      <section classCode="DOCSECT" moodCode="EVN">
        ...
      </section>
    </component>
  </structuredBody>
</component>
</ClinicalDocument>

```

3.2.2.3. Immunization Content (IC)

Template ID	1.3.6.1.4.1.19376.1.5.3.1.1.18.1.2	
Reference(s)	IHE PCC Technical Framework Vol. 2 : 6.3.1.10	
Base Template (IS-A)	Medical Summary	
Document Code	LOINC: 11369-6 (HISTORY OF IMMUNIZATIONS)	
XDS Format Code	IHE Format Code: urn:ihe:pcc:xds-ms:2007	
XDS Type Code	LOINC: 11369-6	
Description	The immunization content document type is used to record the history of immunizations related to a patient. The immunization content document is a “living document” meaning it may change over the lifetime of the patient’s care.	
Expected Sections		
Section	Template ID	Reference
Vital Signs	1.3.6.1.4.1.19376.1.5.3.1.3.25 or 1.3.6.1.4.1.19376.1.5.3.1.1.5.3.2	3.3.2.17
Pregnancy History	1.3.6.1.4.1.19376.1.5.3.1.1.5.3.4	3.3.2.14
Allergies and Other Adverse Reactions	1.3.6.1.4.1.19376.1.5.3.1.3.13	3.3.2.3
Medications	1.3.6.1.4.1.19376.1.5.3.1.3.19	3.3.2.12
Immunizations	1.3.6.1.4.1.19376.1.5.3.1.3.23	3.3.2.11
Results	1.3.6.1.4.1.19376.1.5.3.1.3.27 or 1.3.6.1.4.1.19376.1.5.3.1.3.28	3.3.2.7
Advance Directives	1.3.6.1.4.1.19376.1.5.3.1.3.34 or 1.3.6.1.4.1.19376.1.5.3.1.3.35	3.3.2.2
Problems	1.3.6.1.4.1.19376.1.5.3.1.3.6	3.3.2.1
History of Past Illness	1.3.6.1.4.1.19376.1.5.3.1.3.8	3.3.2.10
OpenSHR Implementation Notes		

Additional Constraints	<ul style="list-style-type: none"> <li>OpenSHR does not support the “Immunization Recommendations” section at level 3 conformance, IC content containing this section will be imported at level 2.</li> </ul>
Notes	<ul style="list-style-type: none"> <li>This document type is currently only supported for import.</li> </ul>

Specification	
<pre> &lt;ClinicalDocument xmlns="urn:h17-org:v3" xmlns:xsi="http://www.w3.org/2001/XMLSchema- instance" classCode="DOCCLIN" moodCode="EVN"&gt;   &lt;realmCode code="UV"/&gt;   &lt;typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.18.1.2"/&gt;   &lt;id root="1.2.3.4.5.6.9.100.2" extension="2-20141027135823"/&gt;   &lt;code code="11369-6" codeSystem="2.16.840.1.113883.6.1"     codeSystemName="LOINC" displayName="HISTORY OF IMMUNIZATIONS"/&gt;   &lt;title language="en-US"&gt;HISTORY OF PATIENT IMMUNIZATIONS&lt;/title&gt;   &lt;effectiveTime value=""/&gt;   &lt;confidentialityCode code="" codeSystem="2.16.840.1.113883.5.25" codeSystemName="x_BasicConfidentialityKind"/&gt;   &lt;languageCode code=""/&gt;   &lt;!-- 1..1 Authors --&gt;   &lt;recordTarget typeCode="RCT" contextControlCode="OP"&gt;     &lt;patientRole classCode="PAT"&gt;       ...     &lt;/patientRole&gt;   &lt;/recordTarget&gt;   &lt;!-- 1..n Authors --&gt;   &lt;author typeCode="AUT" contextControlCode="OP"&gt;     &lt;time value=""/&gt;     &lt;assignedAuthor classCode="ASSIGNED"&gt;       ...     &lt;/assignedAuthor&gt;   &lt;/author&gt;   &lt;!-- 1..1 Custodial Organization --&gt;   &lt;custodian typeCode="CST"&gt;     &lt;assignedCustodian classCode="ASSIGNED"&gt;       &lt;representedCustodianOrganization classCode="ORG" determinerCode="INSTANCE"&gt;         ...       &lt;/representedCustodianOrganization&gt;     &lt;/assignedCustodian&gt;   &lt;/custodian&gt;   &lt;!-- 0..n Participants --&gt;   &lt;participant typeCode="IND"&gt;     &lt;time value=""/&gt;     &lt;associatedEntity classCode="PRS"&gt;       ...     &lt;/associatedEntity&gt;   &lt;/participant&gt;   &lt;!-- 1..n Documentation Of --&gt;   &lt;documentationOf typeCode="DOC"&gt;     &lt;serviceEvent classCode="PCPR" moodCode="EVN"&gt;       &lt;effectiveTime&gt;         &lt;low value=""/&gt;         &lt;high value=""/&gt;       &lt;/effectiveTime&gt;     &lt;/serviceEvent&gt;   &lt;/documentationOf&gt;   &lt;!-- 1..1 Component --&gt; </pre>	

```

<component typeCode="COMP" contextConductionInd="true">
  <!-- Must be structured body -->
  <structuredBody classCode="DOCBODY" moodCode="EVN">

    <!-- 1..n Components -->
    <component typeCode="COMP" contextConductionInd="true">
      <!-- 1..1 Section -->
      <section classCode="DOCSECT" moodCode="EVN">
        ...
      </section>
    </component>
  </structuredBody>
</component>
</ClinicalDocument>

```

#### Example

The following example illustrates an IC document indicating that a patient has received BCG and OPV vaccines.

```

<?xml version="1.0" encoding="utf-8"?>
<ClinicalDocument xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
classCode="DOCCLIN" moodCode="EVN" xmlns="urn:hl7-org:v3">
  <realmCode code="UV" />
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040" />
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.18.1.2" />
  <id root="5858AEDB-05AD-4BDD-9018-6AD317F87955" />
  <code code="11369-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="HISTORY OF IMMUNIZATIONS" />
  <title language="en-US">Immunization History</title>
  <effectiveTime value="20150105090657.170-0500" />
  <confidentialityCode code="N" codeSystem="2.16.840.1.113883.5.25"
displayName="normal" />
  <languageCode code="en-US" />
  <recordTarget typeCode="RCT" contextControlCode="OP">
    <patientRole classCode="PAT">
      <id root="8.48.3.2.3.4.5.6.7.5.4" extension="635560492116819361" />
      <id root="9.1.2.3.4.5.0" extension="2022" />
      <addr use="H">
        <country>CA</country>
      </addr>
      <patient classCode="PSN" determinerCode="INSTANCE">
        <name use="L">
          <family>Morris</family>
          <given>Lyssa</given>
        </name>
        <administrativeGenderCode code="F" />
        <birthTime value="20150105" />
      </patient>
    </patientRole>
  </recordTarget>
  <author typeCode="AUT" contextControlCode="AP">
    <time value="20150105090657.170-0500" />
    <assignedAuthor classCode="ASSIGNED">
      <id root="8.48.3.2.3.4.5.6.7.5.4.6" extension="24" />
      <addr use="PHYS">
        <streetAddressLine>4500 King St. E</streetAddressLine>

```

```

    <city>Lincoln</city>
    <state>ON</state>
    <country>CA</country>
    <postalCode>L0R 1B4</postalCode>
  </addr>
  <assignedPerson classCode="PSN" determinerCode="INSTANCE">
    <name use="L">
      <family>General</family>
      <given>Gerald</given>
    </name>
  </assignedPerson>
  <representedOrganization classCode="ORG" determinerCode="INSTANCE">
    <id root="8.48.3.2.3.4.5.6.7.5.4.9" extension="1305" />
    <name>General Medical Associates</name>
  </representedOrganization>
</assignedAuthor>
</author>
<custodian typeCode="CST">
  <assignedCustodian classCode="ASSIGNED">
    <representedCustodianOrganization classCode="ORG" determinerCode="INSTANCE">
      <id root="8.48.3.2.3.4.5.6.7.5.4.9" extension="1305" />
      <name>General Medical Associates</name>
      <addr use="PHYS">
        <streetAddressLine>4500 King St. E</streetAddressLine>
        <city>Lincoln</city>
        <state>ON</state>
        <country>CA</country>
        <postalCode>L0R 1B4</postalCode>
      </addr>
    </representedCustodianOrganization>
  </assignedCustodian>
</custodian>
<participant typeCode="IND" contextControlCode="ON">
  <time value="2015" />
  <associatedEntity classCode="NOK">
    <id root="8.48.3.2.3.4.5.6.7.5.4" extension="635560492116818824" />
    <id root="9.2.5.6.5.2.1.2.3.5" extension="391f094b-c6f3-4eec-b9ed-24d7c3cfde84" />
  </associatedEntity>
  <id root="9.1.2.3.4.5.0" extension="2020" />
  <code code="MTH" codeSystem="2.16.840.1.113883.5.111" displayName="Mother" />
  <addr use="H">
    <streetAddressLine>West 5th</streetAddressLine>
    <city>Grimsby</city>
    <state>ON</state>
    <country>CA</country>
  </addr>
  <telecom nullFlavor="NI" />
  <associatedPerson classCode="PSN" determinerCode="INSTANCE">
    <name use="L">
      <family>Morris</family>
      <given>Madeline</given>
    </name>
  </associatedPerson>
</associatedEntity>
</participant>
<participant typeCode="IND" contextControlCode="ON">
  <time value="2015" />
  <associatedEntity classCode="NOK">

```

```

<id root="8.48.3.2.3.4.5.6.7.5.4" extension="635560492116818824" />
<id root="9.2.5.6.5.2.1.2.3.5" extension="391f094b-c6f3-4eec-b9ed-24d7c3cfd84"
/>
<id root="9.1.2.3.4.5.0" extension="2020" />
<code code="FTH" codeSystem="2.16.840.1.113883.5.111" displayName="Father" />
<addr use="H">
  <streetAddressLine>West 5th</streetAddressLine>
  <city>Grimsby</city>
  <state>ON</state>
  <country>CA</country>
</addr>
<telecom nullFlavor="NI" />
<associatedPerson classCode="PSN" determinerCode="INSTANCE">
  <name use="L">
    <family>Morris</family>
    <given>Benjamin</given>
  </name>
</associatedPerson>
</associatedEntity>
</participant>
<component typeCode="COMP" contextConductionInd="true">
  <structuredBody classCode="DOCBODY" moodCode="EVN">
    <component typeCode="COMP" contextConductionInd="true">
      <section classCode="DOCSECT" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.1.6" />
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.23" />
        <id root="07E142AC-974C-42B9-A3A3-C7F11303196A" />
        <code code="11369-6" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC" displayName="HISTORY OF IMMUNIZATIONS" />
        <title language="en-US">Immunizations</title>
        <text language="en-US">
          <list>
            <item ID="id4db85">2015-Jan-05 - Oral Polio Vaccine via Swallow,
Oral</item>
            <item ID="idffda6">2015-Jan-05 - BCG via injection, subcutaneous</item>
          </list>
        </text>
        <entry typeCode="COMP" contextConductionInd="true">
          <substanceAdministration classCode="SBADM" moodCode="EVN">
            <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.12" />
            <templateId root="2.16.840.1.113883.10.20.1.24" />
            <id root="FB5E112D-CC17-43EB-B43F-B90850B34B28" />
            <code code="IMMUNIZ" codeSystem="2.16.840.1.113883.5.4"
codeSystemName="ActCode" displayName="Immunization" />
            <text mediaType="text/plain">
              <reference value="#id4db85" />
            </text>
            <statusCode code="completed" />
            <effectiveTime xsi:type="IVL_TS" value="20150105090657.154-0500" />
            <routeCode code="PO" codeSystem="2.16.840.1.113883.5.112"
codeSystemName="Route Of Administration" displayName="Swallow, Oral" />
            <doseQuantity value="1" />
            <consumable typeCode="CSM">
              <manufacturedProduct classCode="MANU">
                <manufacturedMaterial classCode="MMAT" determinerCode="KIND">
                  <code code="02" codeSystem="2.16.840.1.113883.6.59"
codeSystemName="HL7CVX" displayName="Oral Polio Vaccine" />
                  <name>Oral Polio Vaccine</name>
                </manufacturedMaterial>
              </manufacturedProduct>
            </consumable>
          </substanceAdministration>
        </entry>
      </section>
    </component>
  </structuredBody>
</component>

```

```

        </manufacturedMaterial>
    </manufacturedProduct>
</consumable>
</substanceAdministration>
</entry>
<entry typeCode="COMP" contextConductionInd="true">
    <substanceAdministration classCode="SBADM" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.12" />
        <templateId root="2.16.840.1.113883.10.20.1.24" />
        <id root="37EA3A9A-48E2-4293-866E-18D1CD96FC13" />
        <code code="IMMUNIZ" codeSystem="2.16.840.1.113883.5.4"
codeSystemName="ActCode" displayName="Immunization" />
        <text mediaType="text/plain">
            <reference value="#idffda6" />
        </text>
        <statusCode code="completed" />
        <effectiveTime xsi:type="IVL_TS" value="20150105090657.170-0500" />
        <routeCode code="SQ" codeSystem="2.16.840.1.113883.5.112"
codeSystemName="Route Of Administration" displayName="injection, subcutaneous" />
        <doseQuantity value="1" />
        <consumable typeCode="CSM">
            <manufacturedProduct classCode="MANU">
                <manufacturedMaterial classCode="MMAT" determinerCode="KIND">
                    <code code="19" codeSystem="2.16.840.1.113883.6.59"
codeSystemName="HL7CVX" displayName="BCG" />
                    <name>BCG</name>
                </manufacturedMaterial>
            </manufacturedProduct>
        </consumable>
    </substanceAdministration>
</entry>
</section>
</component>
</structuredBody>
</component>
</ClinicalDocument>

```

#### 3.2.2.4. Continuity of Care Document+

Template ID	TBD	
Reference(s)	HL7 Continuity Of Care Document	
Base Template (IS-A)	Continuity of Care Document	
Document Code	LOINC: 34133-9 (SUMMARIZATION OF EPISODE NOTE)	
XDS Format Code	IHE Format Code: urn:ad:ohie:ccd+:2014	
XDS Type Code	LOINC: 34133-9	
Description	The Continuity of Care Document+ template is an OpenHIE specific document template which encapsulates the constraints of HL7 CCD adding additional sections to represent a more complete view of the patient.	
Expected Sections		
Section	Template ID	Reference
Visit Summary Flow sheet	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.2	3.3.2.5
History of Surgical Procedures	1.3.6.1.4.1.19376.1.5.3.1.1.16.2.2	



Coded Antenatal Testing and Surveillance	1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5.1	3.3.2.4
Allergies and Other Adverse Reactions	1.3.6.1.4.1.19376.1.5.3.1.3.13	3.3.2.3
Medications	1.3.6.1.4.1.19376.1.5.3.1.3.19	3.3.2.12
Care Plan	1.3.6.1.4.1.19376.1.5.3.1.3.31	
Advance Directives	1.3.6.1.4.1.19376.1.5.3.1.3.34 or 1.3.6.1.4.1.19376.1.5.3.1.3.35	3.3.2.2
Problems	1.3.6.1.4.1.19376.1.5.3.1.3.6	3.3.2.1
Vital Signs	1.3.6.1.4.1.19376.1.5.3.1.3.25 or 1.3.6.1.4.1.19376.1.5.3.1.1.5.3.2	3.3.2.17
Family History	1.3.6.1.4.1.19376.1.5.3.1.3.14 or 1.3.6.1.4.1.19376.1.5.3.1.3.15	3.3.2.9
Social History	1.3.6.1.4.1.19376.1.5.3.1.3.16 or 1.3.6.1.4.1.19376.1.5.3.1.3.16.1	3.3.2.15
Results	1.3.6.1.4.1.19376.1.5.3.1.3.27 or 1.3.6.1.4.1.19376.1.5.3.1.3.28	3.3.2.7
History of Present Illness	1.3.6.1.4.1.19376.1.5.3.1.3.4	
History of Past Illness	1.3.6.1.4.1.19376.1.5.3.1.3.8	3.3.2.10
Pregnancy History	1.3.6.1.4.1.19376.1.5.3.1.1.5.3.4	3.3.2.14
Immunizations	1.3.6.1.4.1.19376.1.5.3.1.3.23	3.3.2.11
Procedures	2.16.840.1.113883.10.20.1.12	3.3.2.15

#### OpenSHR Implementation Notes

Additional Constraints	<ul style="list-style-type: none"> <li>This document type cannot currently be imported by OpenSHR.</li> </ul>
Notes	<ul style="list-style-type: none"> <li>This document will contain the aggregate information of each section provided by one of APHP, APS, IC or XDS-MS documents imported with corresponding sections.</li> <li>This document type is currently only supported for export.</li> </ul>

#### Specification

```
<ClinicalDocument xmlns="urn:h17-org:v3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" classCode="DOCCLIN" moodCode="EVN">
  <realmCode code="UV"/>
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <templateId root="TBD"/>
  <id root="1.2.3.4.5.6.9.100.2" extension="2-20141027135823"/>
  <code code="34133-9" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="SUMMARIZATION OF EPISODE NOTE"/>
  <title language="en-US">SUMARIZATION OF EPISODE NOTE</title>
  <effectiveTime value=""/>
  <confidentialityCode code="" codeSystem="2.16.840.1.113883.5.25"
codeSystemName="x_BasicConfidentialityKind"/>
  <languageCode code=""/>
  <!-- 1..1 Authors -->
  <recordTarget typeCode="RCT" contextControlCode="OP">
    <patientRole classCode="PAT">
      ...
    </patientRole>
  </recordTarget>
```

```

<!-- 1..n Authors -->
<author typeCode="AUT" contextControlCode="OP">
  <time value=""/>
  <assignedAuthor classCode="ASSIGNED">
    ...
  </assignedAuthor>
</author>
<!-- 1..1 Custodial Organization -->
<custodian typeCode="CST">
  <assignedCustodian classCode="ASSIGNED">
    <representedCustodianOrganization classCode="ORG" determinerCode="INSTANCE">
      ...
    </representedCustodianOrganization>
  </assignedCustodian>
</custodian>
<!-- 0..n Participants -->
<participant typeCode="IND">
  <time value=""/>
  <associatedEntity classCode="PRS">
    ...
  </associatedEntity>
</participant>
<!-- 1..n Documentation Of -->
<documentationOf typeCode="DOC">
  <serviceEvent classCode="PCPR" moodCode="EVN">
    <effectiveTime>
      <low value=""/>
      <high value=""/>
    </effectiveTime>
  </serviceEvent>
</documentationOf>
<!-- 1..1 Component -->
<component typeCode="COMP" contextConductionInd="true">
  <!-- Must be structured body -->
  <structuredBody classCode="DOCBODY" moodCode="EVN">

    <!-- 1..n Components -->
    <component typeCode="COMP" contextConductionInd="true">
      <!-- 1..1 Section -->
      <section classCode="DOCSECT" moodCode="EVN">
        ...
      </section>
    </component>
  </structuredBody>
</component>
</ClinicalDocument>

```

### 3.3. CDA Section Constraints

The CDA import modules in OpenMRS will iterate over level 2 or level 3 CDA documents and execute import on sections found within the document. At minimum, any CDA section is imported at level 2 (text only) and those registered within the CDA handler as level 3 sections will have discrete data elements from each entry imported into the OpenMRS data store.

### 3.3.1. Section Implementation Details

#### 3.3.1.1. Basic Section Elements

The basic elements of a section are listed in Table 7.

Table 7 - Basic section elements

Element	Description
<id>	Uniquely identifies the section. This is used to detect duplicates, and to facilitate replacement of section data.
<code>	Classifies the type of data that a section contains. For example, a section could be classified as “Medication History”, or “Vital Signs”.
<title>	A human readable title for the section. Typically the title should be related to the classification of the section.
<text>	A structured, human readable representation of the data within the section.

#### 3.3.1.2. Section Text

The text of a section is structured CDA elements which can be used to present a display of data represented in the entries (or in the case of a level 2 section, the data itself). Whenever text from an entry is represented, it shall be referenced. For example, the following would be invalid:

```
<component typeCode="COMP" contextConductionInd="true">
  <section classCode="DOCSECT" moodCode="EVN">
    ...
    <text mediaType="text/x-hl7-text+xml">
      ...
    </text>
    <entry typeCode="DRIV" contextConductionInd="true">
      <organizer classCode="BATTERY" moodCode="EVN">
        <component typeCode="COMP" contextConductionInd="true">
          <observation classCode="OBS" moodCode="EVN">
            <text representation="TXT" language="en-US">
              Some sort of observation
            </text>
          </observation>
        </component>
      </organizer>
    </entry>
  </section>
</component>
```

Rather, text of the entries are linked to the text of the section via the ID and reference elements:

```
<component typeCode="COMP" contextConductionInd="true">
  <section classCode="DOCSECT" moodCode="EVN">
    <text mediaType="text/x-hl7-text+xml">
      <list>
        <item ID="obs1">
          Some sort of observation
        </item>
      </list>
    </text>
    <entry typeCode="DRIV" contextConductionInd="true">
      <organizer classCode="BATTERY" moodCode="EVN">
        <component typeCode="COMP" contextConductionInd="true">
          <observation classCode="OBS" moodCode="EVN">
            <text representation="TXT" language="en-US">
              <reference value="#obs1"/>
            </text>
          </observation>
        </component>
      </organizer>
    </entry>
  </section>
</component>
```

### 3.3.1.3. Replacing an Existing Section

CDA documents have no native mechanism to express an explicit replacement of a section’s text as often the text id derived from entries within the document. However there may come a time when it is desirable to update (or replace) the text of a level 2 section with new information. In the OpenSHR CDA import module, this is done by submitting a section with the identifier of the section to be replaced. This will cause the observation group within OpenMRS to be voided and replaced with a new text.

This functionality is only supported when the updateExisting SHR configuration flag is set to true, otherwise duplicate identifiers result in an exception while importing.

### 3.3.2. Implemented Section Templates

Currently, OpenSHR will import any Level 2 section (sections which are not registered as Level 3 sections) as a complex Obs having complex content. The sections identified in are registered as Level 3 sections, meaning any discrete data elements which they contain will be imported into the appropriate OpenMRS data structure.

Section	Template ID(s) <sup>1</sup>	Reference
Active Problems	2.16.840.1.113883.10.20.1.11 1.3.6.1.4.1.19376.1.5.3.1.3.6	3.3.2.1
Advance Directives	2.16.840.1.113883.10.20.1.1 1.3.6.1.4.1.19376.1.5.3.1.3.34 1.3.6.1.4.1.19376.1.5.3.1.3.35	3.3.2.2
Allergies and Other Adverse Reactions	2.16.840.1.113883.10.20.1.2 1.3.6.1.4.1.19376.1.5.3.1.3.13	3.3.2.3
Antenatal Testing and Surveillance	1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5 1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5.1	3.3.2.4
Antepartum Visit Summary Flow sheet	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.2	3.3.2.5
History of Infection	1.3.6.1.4.1.19376.1.5.3.1.1.16.2.1.1.1	3.3.2.6
Results	2.16.840.1.113883.10.20.1.14 1.3.6.1.4.1.19376.1.5.3.1.3.27 1.3.6.1.4.1.19376.1.5.3.1.3.28	3.3.2.7
Estimated Delivery Date	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.1	3.3.2.8
Family Medical History	2.16.840.1.113883.10.20.1.4 1.3.6.1.4.1.19376.1.5.3.1.3.14 1.3.6.1.4.1.19376.1.5.3.1.3.15	3.3.2.9
History of Past Illness	1.3.6.1.4.1.19376.1.5.3.1.3.8	3.3.2.10
Immunizations	2.16.840.1.113883.10.20.1.6 1.3.6.1.4.1.19376.1.5.3.1.3.23	3.3.2.11
Medications	2.16.840.1.113883.10.20.1.8 1.3.6.1.4.1.19376.1.5.3.1.3.19	3.3.2.12
Physical Examination		3.3.2.13
Pregnancy History	1.3.6.1.4.1.19376.1.5.3.1.1.5.3.4	3.3.2.14
Social History		3.3.2.15
Vital Signs		3.3.2.17

1 – When generating this section identifier, content creators SHOULD include all template identifiers listed, however OpenSHR will still understand most sections with only one of the template identifiers provided.

### 3.3.2.1. Active Problems

Section Code	LOINC: 11450-4 (PROBLEM LIST)	
Description	Used to capture the current list of problems associated with the patient in either a coded or un-coded manner. The problem list is comprised of problem concern acts which identify when the particular was/is of concern.	
CDA Level	Level 3 Section Only	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD	2.16.840.1.113883.10.20.1.11	HL7 CCD 3.5
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.6	IHE PCC TF-2 : 6.3.3.2.3
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Problem Concern	1.3.6.1.4.1.19376.1.5.3.1.4.5.2	3.4.2.18
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	ActiveProblemSectionProcessor.java	
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>	
Notes	Content creators may produce an Active Problems section at CDA Level 2 conformance, however this is not recommended as Level 2 entries will not be produced on ODD instances when Level 3 problems exist.	
Specification		
<pre> &lt;section&gt;   &lt;!-- IHE PCC Template ID --&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.6"/&gt;   &lt;!-- HL7 CCD Template ID --&gt;   &lt;templateId root="2.16.840.1.113883.10.20.1.11"/&gt;   &lt;!-- Problems section template --&gt;   &lt;code code="11450-4" codeSystem="2.16.840.1.113883.6.1"     codeSystemName="LOINC" displayName="Problem list" /&gt;   &lt;title&gt;Problems&lt;/title&gt;   &lt;text&gt;     &lt;!-- Text as described in general notes --&gt;   &lt;/text&gt;   &lt;!-- 0 .. n Problem Concern Entries --&gt;   &lt;entry&gt;     &lt;act classCode="ACT" moodCode="EVN"&gt;       ...     &lt;/act&gt;   &lt;/entry&gt; &lt;/section&gt; </pre>		
Example		
<p><i>An example illustrating a patient who has had Asthma whereby the condition started sometime in 1990. The condition is currently a concern.</i></p>		

```

<section>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.6" />
  <templateId root="2.16.840.1.113883.10.20.1.11" />
  <code code="11450-4" codeSystem="2.16.840.1.113883.6.1"
    codeSystemName="LOINC" displayName="Problem list" />
  <title>Problems</title>
  <text>
    <table border="1" width="100%">
      <thead>
        <tr>
          <th>Problem</th>
          <th>Effective Dates</th>
          <th>Problem Status</th>
        </tr>
      </thead>
      <tbody>
        <tr ID="PROBSUMMARY_1">
          <td ID="PROBKIND_1">Asthma</td>
          <td>1990</td>
          <td ID="PROBSTATUS_1">Active</td>
        </tr>
      </tbody>
    </table>
  </text>
  <entry typeCode="DRIV">
    <act classCode="ACT" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.1.27" />
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.1" />
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.2" />
      <id root="6a2fa88d-4174-4909-aece-db44b60a3abb" />
      <code nullFlavor="NA" />
      <statusCode code="active" />
      <effectiveTime>
        <low value="1990" />
        <high nullFlavor="UNK" />
      </effectiveTime>
      <entryRelationship typeCode="SUBJ" inversionInd="false">
        <observation classCode="OBS" moodCode="EVN">
          <templateId root="2.16.840.1.113883.10.20.1.28" />
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5" />
          <id root="d11275e7-67ae-11db-bd13-0800200c9a66" />
          <code code="64572001" displayName="Condition"
            codeSystem="2.16.840.1.113883.6.96"
            codeSystemName="SNOMED-CT" />
          <text>
            <reference value="#PROBSUMMARY_1" />
          </text>
          <statusCode code="completed" />
          <effectiveTime>
            <low value="1990" />
          </effectiveTime>
          <value xsi:type="CD" displayName="Asthma" code="195967001"
            codeSystemName="SNOMED" codeSystem="2.16.840.1.113883.6.96" />
        </observation>
      </entryRelationship>
    </act>
  </entry>
</section>

```

### 3.3.2.2. Advance Directives

Section Code	LOINC: 42348-3 (ADVANCE DIRECTIVES)	
Description	Used to capture the current list of advance directives such as DNR orders or blood transfusions. The content of this section MAY be level 2 as identified by template id listed below as 2/IHE however SHOULD be level 3. When this section is produced using Level 3 entries, the content is a series of Advance Directive observations with optional status observations describing the status of the advance directive.	
CDA Level	Level 2 or 3 (depends on the template ID used)	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD	2.16.840.1.113883.10.20.1.1	HL7 CCD 3.2
2 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.34	IHE PCC TF-2 : 6.3.3.6.5
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.35	IHE PCC TF-2 : 6.3.3.6.6
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Advance Directive	2.16.840.1.113883.10.20.1.17	3.4.2.1
Observation	1.3.6.1.4.1.19376.1.5.3.1.4.13.7	
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	AdvanceDirectiveSectionProcessor.java	
Additional Constraints	<ul style="list-style-type: none"> <li>When template id 1.3.6.1.4.1.19376.1.5.3.1.3.35 is used, the content creator SHOULD include at least one advance directive observation.</li> </ul>	
Notes	An advance directive related to blood transfusion SHOULD be provided (as identified in the APS document template), however OpenSHR does not require this and will process an Advance Directive section without this advance directive.	
Specification		
<pre> &lt;section classCode="DOCSECT" moodCode="EVN"&gt;   &lt;!-- HL7 CCD Template ID --&gt;   &lt;templateId root="2.16.840.1.113883.10.20.1.1"/&gt;   &lt;!-- IHE Template ID Advance Directives (unstructured) --&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.34"/&gt;   &lt;!-- IHE Template ID Advance Directives (coded) --&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.35"/&gt;   &lt;!-- Advance Directives code --&gt;   &lt;code code="42348-3" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"   displayName="ADVANCE DIRECTIVES"/&gt;   &lt;title&gt;Advance Directives&lt;/title&gt;   &lt;!-- Text as described in general notes --&gt;   &lt;text mediaType="text/x-hl7-text+xml"&gt;   &lt;/text&gt;   &lt;!-- 1..n Advance Directive Observations (if coded) --&gt;   &lt;entry typeCode="DRIV" contextConductionInd="true"&gt;     &lt;observation classCode="OBS" moodCode="EVN" negationInd="true"&gt;       ...     &lt;/observation&gt;   &lt;/entry&gt; </pre>		

</section>

### Example

The following example illustrates a patient who has refused blood transfusion, a directive which has been active since October 28, 2014.

```
<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.1.1"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.34"/>
  <id root="c295a96e-6226-4705-b028-eaee339da691"/>
  <code code="42348-3" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
  displayName="ADVANCE DIRECTIVES"/>
  <title language="en-US">Advance Directives</title>
  <text mediaType="text/x-hl7-text+xml">
    <table>
      <thead>
        <tr>
          <th>Observation</th>
          <th>Date/Time</th>
          <th>Observed Value</th>
          <th>Author</th>
          <th>Interpretation</th>
          <th>Status</th>
          <th>Notes</th>
        </tr>
      </thead>
      <tbody>
        <tr ID="obs317ef3a7">
          <td>Blood Transfusion</td>
          <td>Since Tue Oct 28 2014</td>
          <td>
            False
          </td>
          <td>
            Author
          </td>
          <td></td>
          <td ID="obs8a4b3b73">Current and Verified</td>
          <td></td>
        </tr>
      </tbody>
    </table>
  </text>
  <entry typeCode="DRIV" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.7"/>
      <templateId root="2.16.840.1.113883.10.20.1.17"/>
      <id root="4dce8759-e246-4eaa-be61-255b4ed6d57a"/>
      <code code="(xx-bld-transf-ok)" codeSystem="2.16.840.1.113883.6.1"
      codeSystemName="LOINC" displayName="Blood Transfusion"/>
      <text representation="TXT" language="en-US">
        <reference value="#obs317ef3a7"/>
      </text>
      <statusCode code="completed"/>
      <effectiveTime>
        <low value="20141028"/>
      </effectiveTime>
    </observation>
  </entry>
</section>
```



```

</effectiveTime>
<value xsi:type="BL" value="false"/>
<entryRelationship typeCode="REFR" contextConductionInd="true">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.37"/>
    <templateId root="2.16.840.1.113883.10.20.1.57"/>
    <code code="33999-4" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC" displayName="Status"/>
    <text representation="TXT" language="en-US">
      <reference value="#obs8a4b3b73"/>
    </text>
    <statusCode code="completed"/>
    <value xsi:type="CD" code="425392003" codeSystem="2.16.840.1.113883.6.96"
displayName="Current and Verified"/>
  </observation>
</entryRelationship>
</observation>
</entry>
</section>

```

### 3.3.2.3. Allergies and Other Adverse Reactions

Section Code	LOINC: 48765-2 (Allergies, adverse reactions, alerts)	
Description	The Allergies and Other Adverse reactions section (in CCD known as the Alerts section) contains information related to current allergies and intolerances that are of concern when delivering care to the patient.	
CDA Level	Level 3 Only	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD	2.16.840.1.113883.10.20.1.2	HL7 CCD 3.8
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.13	IHE PCC TF-2: 6.3.3.2.11
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Allergy and Intolerances Concern	1.3.6.1.4.1.19376.1.5.3.1.4.5.3	3.4.2.3
	2.16.840.1.113883.10.20.1.27	
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	AllergiesAndOtherAdverseReactionsSectionProcessor.java	
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>	
Notes	The allergies and intolerances section SHOULD contain a concern entry related to an allergy to latex. This allergy can be negated through a negation indicator to indicate a non-allergy.	
Specification		
<pre> &lt;section classCode="DOCSECT" moodCode="EVN"&gt;   &lt;!-- CCD Alerts Section Template --&gt;   &lt;templateId root="2.16.840.1.113883.10.20.1.2"/&gt;   &lt;!-- IHE PCC Allergies and Intolerances Section Template --&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.13"/&gt;   &lt;!-- Code for section must be 48765-2 --&gt;   &lt;code code="48765-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Allergies, adverse reactions, alerts"/&gt;   &lt;title language="en-US"&gt;Allergies and Intolerances&lt;/title&gt; </pre>		

```

<!-- Text as described in general implementation notes -->
<text mediaType="text/x-hl7-text+xml">
  ...
</text>
<!-- 0..n Allergy and Intolerance Concerns -->
<entry typeCode="DRIV" contextConductionInd="true">
  <act classCode="ACT" moodCode="EVN">
    ...
  </act>
</entry>
</section>

```

## Examples

*This example illustrates an active, severe allergy to penicillin with a reaction of anaphylaxis.*

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.1.2"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.13"/>
  <id root="9c659a8c-d93f-4627-a37c-46b50744699b"/>
  <code code="48765-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
  displayName="Allergies, adverse reactions, alerts"/>
  <title language="en-US">Allergies and Intolerances</title>
  <text mediaType="text/x-hl7-text+xml">
    ...
  </text>
  <entry typeCode="DRIV" contextConductionInd="true">
    <act classCode="ACT" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.3"/>
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.1"/>
      <templateId root="2.16.840.1.113883.10.20.1.27"/>
      <id root="1.2.3.4.5.6.9.5" extension="1"/>
      <code nullFlavor="NA"/>
      <statusCode code="active"/>
      <effectiveTime>
        <low value="20070115141530"/>
      </effectiveTime>
      <entryRelationship typeCode="SUBJ" inversionInd="false"
        contextConductionInd="true">
        <observation classCode="OBS" moodCode="EVN">
          <templateId root="2.16.840.1.113883.10.20.1.28"/>
          <templateId root="2.16.840.1.113883.10.20.1.18"/>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.6"/>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
          <id root="7aea1b00-b972-48e8-acb6-adc0e9cef77b"/>
          <code code="DALG" codeSystem="2.16.840.1.113883.5.4"
            codeSystemName="ObservationIntoleranceType" displayName="Drug Allergy"/>
          <text representation="TXT" language="en-US">
            <reference value="#obs1afe29b3"/>
          </text>
          <statusCode code="completed"/>
          <effectiveTime value="20140609102005.000-0600"/>
          <value xsi:type="CD" code="373270004" codeSystem="2.16.840.1.113883.6.96"
            codeSystemName="SNOMED CT" displayName="PENICILLIN"/>
          </value>
          <participant typeCode="CSM" contextControlCode="OP">
            <participantRole classCode="MANU">

```

```

    <playingEntity classCode="MMAT" determinerCode="INSTANCE">
      <code code="373270004" codeSystem="2.16.840.1.113883.6.96"
        codeSystemName="SNOMED CT" displayName="PENICILLIN"/>
      <name>PENICILLIN</name>
    </playingEntity>
  </participantRole>
</participant>
<entryRelationship typeCode="SUBJ" inversionInd="true"
  contextConductionInd="true">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.1"/>
    <templateId root="2.16.840.1.113883.10.20.1.55"/>
    <id root="514826d8-6ad8-4618-a7f8-f1f50547bac1"/>
    <code code="SEV" codeSystem="2.16.840.1.113883.5.4"
      codeSystemName="ActCode" displayName="Severity"/>
    <text representation="TXT" language="en-US">
      <reference value="#obs619f7149"/>
    </text>
    <statusCode code="completed"/>
    <value xsi:type="CD" code="H" codeSystem="2.16.840.1.113883.5.1063"
      codeSystemName="ObservationValue" displayName="Severe"/>
  </observation>
</entryRelationship>
<entryRelationship typeCode="MFST" contextConductionInd="true">
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.6.1"/>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.54"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
    <templateId root="2.16.840.1.113883.10.20.1.28"/>
    <id root="853845cb-9f28-4185-a452-96153137e59b"/>
    <id root="1.2.3.4.5.6.9.3" extension="33"/>
    <code code="PROBLEM" codeSystem="1.3.6.1.4.1.19376.1.5.3.2"
      codeSystemName="1.3.6.1.4.1.19376.1.5.3.2"/>
    <text representation="TXT" language="en-US">
      <reference value="#obs6b1be129"/>
    </text>
    <statusCode code="completed"/>
    <effectiveTime>
      <low value="20070115141530"/>
    </effectiveTime>
    <value xsi:type="CD" code="39579001" codeSystem="2.16.840.1.113883.6.96"
      codeSystemName="SNOMED CT" displayName="Anaphylaxis"/>
  </observation>
</entryRelationship>
</observation>
</entryRelationship>
</act>
</entry>
</section>

```

#### 3.3.2.4. Antenatal Testing and Surveillance

Section Code	LOINC: 57078-8 (ANTENATAL TESTING AND SURVEILLANCE)
Description	The antenatal testing a surveillance battery template contains information representing results reported from testing batteries performed as part of an antenatal care visit.
CDA Level	Level 2 & Level 3

Template IDs		
Level / Spec	Template ID	Standards Reference
2 / IHE	1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5	IHE PCC CDA Suppl: 6.3.3.5.6
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5.1	IHE PCC CDA Suppl: 6.3.3.5.7
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Antenatal Testing and Surveillance Battery	1.3.6.1.4.1.19376.1.5.3.1.1.21.3.10	3.4.2.5
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	AntenatalTestingAndSurveillanceSectionProcessor.java	
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>	
Notes		
Specification		
<pre> &lt;section classCode="DOCSECT" moodCode="EVN"&gt;   &lt;!-- IHE PCC Antenatal Testing and Surveillance Section Template --&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5"/&gt;   &lt;!-- IHE PCC Coded Antenatal Testing and Surveillance Section Template --&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5.1"/&gt;   &lt;!-- 1..1 Section Code --&gt;   &lt;code code="57078-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"   displayName="ANTENATAL TESTING AND SURVEILLANCE"/&gt;   &lt;!-- 1..1 Title --&gt;   &lt;title language="en-US"&gt;Antenatal Testing and Surveillance&lt;/title&gt;   &lt;!-- 1..1 Text as described in general implementation notes --&gt;   &lt;text mediaType="text/x-hl7-text+xml"&gt;     ...   &lt;/text&gt;   &lt;!-- 0..n Entries representing testing batteries --&gt;   &lt;entry typeCode="COMP" contextConductionInd="true"&gt;     &lt;organizer classCode="BATTERY" moodCode="EVN"&gt;       ...     &lt;/organizer&gt;   &lt;/entry&gt; &lt;/section&gt; </pre>		
Examples		
<p><i>This example illustrates an antenatal testing battery containing observations for amniotic fluid level and fetal body movement.</i></p> <pre> &lt;section classCode="DOCSECT" moodCode="EVN"&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5"/&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.21.2.5.1"/&gt;   &lt;code code="57078-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"   displayName="ANTENATAL TESTING AND SURVEILLANCE"/&gt;   &lt;title language="en-US"&gt;Antenatal Testing and Surveillance&lt;/title&gt;   &lt;text mediaType="text/x-hl7-text+xml"&gt;     ...   &lt;/text&gt;   &lt;entry typeCode="COMP" contextConductionInd="true"&gt;     &lt;organizer classCode="BATTERY" moodCode="EVN"&gt; </pre>		

```

<templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.21.3.10"/>
<code code="XX-ANTENATALTESTINGBATTERY" codeSystem="2.16.840.1.113883.6.1"/>
<statusCode code="completed"/>
<effectiveTime value="20141230"/>
<component typeCode="COMP" contextConductionInd="true">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
    <id root="e79bc01f-86fe-4928-96f4-6ecf01ad496c"/>
    <code code="11630-1" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC"
      displayName="Fetal Biophysical profile.amniotic fluid volume US"/>
    <statusCode code="completed"/>
    <effectiveTime value="20141230155804.228-0500"/>
    <value xsi:type="ED" representation="TXT" language="en-US">...</value>
    <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
codeSystemName="ObservationInterpretation"/>
  </observation>
</component>
<component typeCode="COMP" contextConductionInd="true">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
    <id root="a1e4cc7f-5e39-4ef8-bea3-8315a665a92d"/>
    <code code="11631-9" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC"
      displayName="Biophysical profile body movement"/>
    <statusCode code="completed"/>
    <effectiveTime value="20141230155804.228-0500"/>
    <value xsi:type="ED" representation="TXT" language="en-US">...</value>
    <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
codeSystemName="ObservationInterpretation"/>
  </observation>
</component>
</organizer>
</entry>
</section>

```

### 3.3.2.5. Antepartum Visit Summary Flow sheet

Section Code	LOINC: 57059-8 (Pregnancy Visit Summary)	
Description	The Antepartum Visit Summary flow sheet section is used to track information related to the most important information noted for the pregnant woman.	
CDA Level	Level 3 Only	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.2	IHE PCC CDA Suppl: 6.3.3.9.3
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Simple Observation	1.3.6.1.4.1.19376.1.5.3.1.4.13	3.4.2.23
Antepartum Flow sheet Battery	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.3.2	3.4.2.6
OpenSHR Implementation Notes		

Data Model	Obs
Code File	AntepartumVisitSummaryFlowsheetSectionProcessor.java
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>
Notes	The simple observation contained within the flow sheet panel section shall be a single observation representing the pregnant woman's pre-pregnancy weight and shall have a code of 8348-5, BODY WEIGHT^PRE PREGNANCY-MASS-PT-QN-MEASURED. The value must be of type PQ. The units SHALL be "kg".

### Specification

```

<component typeCode="COMP" contextConductionInd="true">
  <section classCode="DOCSECT" moodCode="EVN">
    <!-- IHE PCC Antepartum Visit Flow sheet -->
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.2"/>
    <!-- Section Code -->
    <code code="57059-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
      displayName="Pregnancy Visit Summary"/>
    <title language="en-US">Antepartum Visit Flow sheet</title>
    <!-- 1.1 Text as described in the general implementation notes -->
    <text mediaType="text/x-hl7-text+xml">
      ...
    </text>
    <!-- 1.1 Observation representing the pre-pregnancy weight -->
    <entry typeCode="COMP" contextConductionInd="true">
      <observation classCode="OBS" moodCode="EVN">
        ...
      </observation>
    </entry>
    <!-- 1.n Organizer entries representing important pregnancy history information --
  >
  <entry typeCode="COMP" contextConductionInd="true">
    <organizer classCode="BATTERY" moodCode="EVN">
      ...
    </organizer>
  </entry>
</section>
</component>

```

### Examples

*This example illustrates an antenatal flow sheet panel section containing pre-pregnancy weight, blood pressure and fetal presentation information.*

```

<section classCode="DOCSECT" moodCode="EVN">
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.2"/>
  <code code="57059-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
    displayName="Pregnancy Visit Summary"/>
  <title language="en-US">Antepartum flow sheet panel</title>
  <text mediaType="text/x-hl7-text+xml">
    ...
  </text>
  <entry typeCode="COMP" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
      <id root="b5e3b204-80f2-4866-b94b-5218c8bc6787"/>

```

```

        <code code="8348-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
        displayName="Prepregnancy Weight"/>
        <statusCode code="completed"/>
        <effectiveTime value="20150103210300.791-0500"/>
        <value xsi:type="PQ" unit="kg" value="86"/>
        <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
        codeSystemName="ObservationInterpretation"/>
    </observation>
</entry>
<entry typeCode="COMP" contextConductionInd="true">
    <organizer classCode="BATTERY" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.11.2.3.2"/>
        <code code="57061-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
        displayName="Antepartum flow sheet panel"/>
        <statusCode code="completed"/>
        <effectiveTime value="20150103210300.791-0500"/>
        <component typeCode="COMP" contextConductionInd="true">
            <observation classCode="OBS" moodCode="EVN">
                <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
                <id root="d7911c3b-6775-462f-8089-280031d0e7f6"/>
                <code code="11876-0" codeSystem="2.16.840.1.113883.6.1"
                codeSystemName="LOINC" displayName="Fetal presentation by palpation"/>
                <statusCode code="completed"/>
                <effectiveTime value="20150103210300.807-0500"/>
                <value xsi:type="CD" code="21882006" codeSystem="2.16.840.1.113883.6.96"
                codeSystemName="SNOMED CT" displayName="Face Presentation"/>
                <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
                codeSystemName="ObservationInterpretation"/>
            </observation>
        </component>
        <component typeCode="COMP" contextConductionInd="true">
            <observation classCode="OBS" moodCode="EVN">
                <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
                <id root="6a9226d9-1b43-4ee3-a87d-07af4889b4aa"/>
                <code code="8480-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
                displayName="Systolic blood pressure"/>
                <statusCode code="completed"/>
                <effectiveTime value="20150103210300.807-0500"/>
                <value xsi:type="PQ" unit="mm[Hg]" value="120"/>
                <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
                codeSystemName="ObservationInterpretation"/>
            </observation>
        </component>
        <component typeCode="COMP" contextConductionInd="true">
            <observation classCode="OBS" moodCode="EVN">
                <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
                <id root="b88ed3c6-7285-4a73-a341-9ab26942b87e"/>
                <code code="8462-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
                displayName="Diastolic blood pressure"/>
                <statusCode code="completed"/>
                <effectiveTime value="20150103210300.807-0500"/>
                <value xsi:type="PQ" unit="mm[Hg]" value="80"/>
                <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
                codeSystemName="ObservationInterpretation"/>
            </observation>
        </component>
    </organizer>
</entry>

```

</section>

### 3.3.2.6. History of Infection

Section Code	LOINC: 56838-6 (History of Infectious Disease)	
Description	The history of infection section is used to express any infections that the patient may have had prior to the current condition of the patient. It shall contain a narrative and problem concern entries describing each of the past infections.	
CDA Level	Level 3 Only	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.1.16.2.1.1.1	IHE PCC CDA Suppl: 6.3.3.2.37
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Problem Concern Entry	1.3.6.1.4.1.19376.1.5.3.1.4.5.2	3.4.2.20
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	CodedHistoryOfInfectionSectionProcessor.java	
Additional Constraints	• None	
Notes	Each problem concern entry contained within the history of infection sections should be related to past infections, and should exclude current infections.	
Specification		
<pre>&lt;component typeCode="COMP" contextConductionInd="true"&gt;   &lt;section classCode="DOCSECT" moodCode="EVN"&gt;     &lt;!-- IHE PCC History of Infection --&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.16.2.1.1.1"/&gt;     &lt;!-- Section Code --&gt;     &lt;code code="56838-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"       displayName="History of Infectious Disease"/&gt;     &lt;title language="en-US"&gt;History of Infection&lt;/title&gt;     &lt;!-- 1..1 Text as described in the general implementation notes --&gt;     &lt;text mediaType="text/x-hl7-text+xml"&gt;       ...     &lt;/text&gt;     &lt;!-- 0..n Problem concern "act's identifying the past illnesses --&gt;     &lt;entry typeCode="COMP" contextConductionInd="true"&gt;       &lt;act moodCode="EVN"&gt;         ...       &lt;/act&gt;     &lt;/entry&gt;   &lt;/section&gt; &lt;/component&gt;</pre>		

### 3.3.2.7. Results

Section Code	LOINC: 30954-2 (Relevant diagnostic tests/laboratory data)
--------------	--



Description	The results section describes relevant diagnostic test procedures the patient received in the past.	
CDA Level	Level 2 or Level 3	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD	2.16.840.1.113883.10.20.1.14	CCD 3.13
2 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.27	IHE PCC TF-2: 6.3.3.5.1
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.28	IHE PCC TF-2: 6.3.3.5.2
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Results Organizer	2.16.840.1.113883.10.20.1.32	
Procedure	1.3.6.1.4.1.19376.1.5.3.1.4.19	3.4.2.21
External References	1.3.6.1.4.1.19376.1.5.3.1.4.4	3.4.2.8
Simple Observation	2.16.840.1.113883.10.20.1.31 1.3.6.1.4.1.19376.1.5.3.1.4.13	3.4.2.23
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	CodedResultsSectionProcessor.java	
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>	
Notes	The "results organizer" entry and CCD template for Simple Observation (in the CCD documentation Results Observation) are only used by the on-demand documents generator and are not supported in CDA import. The SHR will consume results with Procedures, External References and Simple Observations only.	
Specification		
<pre> &lt;component typeCode="COMP" contextConductionInd="true"&gt;   &lt;section classCode="DOCSECT" moodCode="EVN"&gt;     &lt;!-- IHE PCC Results --&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.27"/&gt;     &lt;!-- IHE PCC Coded Results --&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.28"/&gt;     &lt;!-- Section Code --&gt;     &lt;code code="30954-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"       displayName="Relevant diagnostic tests/laboratory data"/&gt;     &lt;title language="en-US"&gt;Results&lt;/title&gt;     &lt;!-- 1..1 Text as described in the general implementation notes --&gt;     &lt;text mediaType="text/x-hl7-text+xml"&gt;       ...     &lt;/text&gt;     &lt;!-- 0..n Procedures indicating the past procedures --&gt;     &lt;entry typeCode="COMP" contextConductionInd="true"&gt;       &lt;procedure moodCode="EVN"&gt;         ...       &lt;/procedure&gt;     &lt;/entry&gt;     &lt;!-- 0..n Observation indicating results of past procedures --&gt;     &lt;entry typeCode="COMP" contextConductionInd="true"&gt;       &lt;observation classCode="OBS" moodCode="EVN"&gt;         ...       &lt;/observation&gt;     &lt;/entry&gt; </pre>		

```

<!-- 0..n Act entries indicating external references -->
<entry typeCode="COMP" contextConductionInd="true">
  <act moodCode="EVN">
    ...
  </act>
</entry>
</section>
</component>

```

### 3.3.2.8. Estimated Delivery Date

Section Code	LOINC: 57060-6 (Estimated date of delivery)	
Description	The physician's best estimate of a date of delivery. Usually done at initial diagnosis of pregnancy and later confirmed through last menstrual period, ultrasound or physical examination.	
CDA Level	Level 3 Only	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.1	IHE PCC CDA Suppl: 6.3.3.2.28
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Estimated Delivery Date Observation	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.3.1	3.4.2.7
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	EstimatedDeliveryDatesSectionProcessor.java	
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>	
Notes	The estimated delivery dates observation should be passed in all APS and APHP documents sent to the SHR as this is the information used by the SHR to determine the episode (instance) of pregnancy when producing an on-demand APS for the particular pregnancy.	
Specification		
<pre> &lt;component typeCode="COMP" contextConductionInd="true"&gt;   &lt;section classCode="DOCSECT" moodCode="EVN"&gt;     &lt;!-- IHE PCC Estimated Delivery Dates Section --&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.1"/&gt;     &lt;!-- Section Code --&gt;     &lt;code code="57060-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"       displayName="Estimated date of delivery"/&gt;     &lt;!-- 1..1 Title describing the section --&gt;     &lt;title language="en-US"&gt;Estimated Date of Delivery&lt;/title&gt;     &lt;!-- 1..1 Text as described in the general implementation notes --&gt;     &lt;text mediaType="text/x-hl7-text+xml"&gt;       ...     &lt;/text&gt;     &lt;!-- 1..1 Observation entry containing the estimated date of delivery --&gt;     &lt;entry typeCode="COMP" contextConductionInd="true"&gt;       &lt;observation classCode="OBS" moodCode="EVN"&gt;         ...       &lt;/observation&gt;     &lt;/entry&gt; </pre>		

```
</section>
</component>
```

### Example

The following example illustrates an estimated delivery date sometime in June 2015, based on a last menstrual period occurring sometime in September 2014.

```
<component typeCode="COMP" contextConductionInd="true">
  <section classCode="DOCSECT" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.11.2.2.1"/>
    <code code="57060-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
      displayName="Estimated date of delivery"/>
    <title language="en-US">Estimated date of delivery</title>
    <text mediaType="text/x-hl7-text+xml">
      ...
    </text>
    <entry typeCode="COMP" contextConductionInd="true">
      <observation classCode="OBS" moodCode="EVN">
        <!-- EDD observation of June 2015 -->
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.11.2.3.1"/>
        <id root="40a332f0-4a41-49b5-963c-bbebffd86d58"/>
        <code code="11778-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
          displayName="Delivery date estimated"/>
        <statusCode code="completed"/>
        <effectiveTime value="20141230155804.212-0500"/>
        <value xsi:type="TS" value="201506"/>
        <!-- An entry relationship with supporting observation of last menstrual period
          of September 2014 -->
        <entryRelationship typeCode="SPRT" contextConductionInd="true">
          <observation classCode="OBS" moodCode="EVN">
            <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
            <id root="9907e8c1-a117-4d8b-a602-84b656ba398a"/>
            <code code="11779-6" codeSystem="2.16.840.1.113883.6.1"
              codeSystemName="LOINC"
              displayName="Delivery date Estimated from last menstrual period"/>
            <statusCode code="completed"/>
            <effectiveTime value="20141230155804.212-0500"/>
            <value xsi:type="TS" value="201506"/>
            <entryRelationship typeCode="SPRT" contextConductionInd="true">
              <observation classCode="OBS" moodCode="EVN">
                <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
                <id root="55d88180-3ac3-4873-ac0f-6d34f7aafd5a"/>
                <code code="8655-2" codeSystem="2.16.840.1.113883.6.1"
                  codeSystemName="LOINC"
                  displayName="Date of last menstrual period - Patient provided"/>
                <statusCode code="completed"/>
                <effectiveTime value="20141230155804.228-0500"/>
                <value xsi:type="TS" value="201409"/>
              </observation>
            </entryRelationship>
          </observation>
        </entryRelationship>
      </observation>
    </entryRelationship>
  </entry>
</section>
```

```
</component>
```

### 3.3.2.9. Family Medical History

Section Code	LOINC: 10157-6 (HISTORY OF FAMILY MEMBER DISEASES)	
Description	The family medical history section is used to convey the patient's family medical history as either unstructured (CDA Level 2) text or discrete entries via Organizers per each family member.	
CDA Level	Level 2 or Level 3	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD	2.16.840.1.113883.10.20.1.4	CCD 3.6
2 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.14	IHE PCC TF-2: 6.3.3.2.12
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.15	IHE PCC TF-2: 6.3.3.2.13
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Family History	2.16.840.1.113883.10.20.1.23	3.4.2.9
Organizer	1.3.6.1.4.1.19376.1.5.3.1.4.15	
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	FamilyMedicalHistorySectionProcessor.java	
Additional Constraints	• None	
Notes	The OpenSHR CDA processor will use the CCD template only when generating an on-demand document section for family history. Content creators should send the IHE PCC template identifiers.	
Specification		
<pre>&lt;component typeCode="COMP" contextConductionInd="true"&gt;   &lt;section classCode="DOCSECT" moodCode="EVN"&gt;     &lt;!-- CCD Family History Template --&gt;     &lt;templateId root="2.16.840.1.113883.10.20.1.4"/&gt;     &lt;!-- IHE PCC Family History Template --&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.14" /&gt;     &lt;!-- IHE PCC Coded Family History Template --&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.15" /&gt;     &lt;!-- 1..1 Section Code --&gt;     &lt;code code="10157-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"       displayName="HISTORY OF FAMILY MEMBER DISEASES"/&gt;     &lt;title&gt;Family history&lt;/title&gt;     &lt;text&gt;       ...     &lt;/text&gt;     &lt;!-- 0..n Family History Organizers for each family member --&gt;     &lt;entry typeCode="DRIV"&gt;       &lt;organizer moodCode="EVN" classCode="CLUSTER"&gt;         ...       &lt;/organizer&gt;     &lt;/entry&gt;   &lt;/section&gt; &lt;/component&gt;</pre>		
Example		

The following example illustrates a family medical history containing information indicating a father born 1912 who died of a heart attack at age 57 and was diagnosed with hypertension at age 40.

```

<component typeCode="COMP" contextConductionInd="true">
  <section classCode="DOCSECT" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.4" />
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.14" />
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.15" />
    <code code="10157-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
      displayName="HISTORY OF FAMILY MEMBER DISEASES"/>
    <title>Family history</title>
    <text>
      ...
    </text>
    <entry typeCode="DRIV">
      <!-- Organizer for the Father's Medical History -->
      <organizer moodCode="EVN" classCode="CLUSTER">
        <templateId root="2.16.840.1.113883.10.20.1.23" />
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.15" />
        <statusCode code="completed" />
        <!-- Father Record -->
        <subject>
          <relatedSubject classCode="PRS">
            <code code="FTH" codeSystem="2.16.840.1.113883.5.111"
              displayName="Biological father" />
            <subject>
              <sdtc:id xmlns:sdtc="urn:hl7-org:sdtc" root="1.2.3.4.5"
                extension="12304" />
              <administrativeGenderCode code="M" codeSystem="2.16.840.1.113883.5.1"
                displayName="Male" />
              <birthTime value="1912" />
            </subject>
          </relatedSubject>
        </subject>
        <!-- Component observation representing a heart attack -->
        <component>
          <observation classCode="OBS" moodCode="EVN">
            <templateId root="2.16.840.1.113883.10.20.1.42" />
            <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.3" />
            <id root="d42ebf70-5c89-11db-b0de-0800200c9a66" />
            <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4" />
            <statusCode code="completed" />
            <value xsi:type="CD" code="22298006" codeSystem="2.16.840.1.113883.6.96"
              displayName="MI"
              codeSystemName="SNOMED-CT" />
            <!-- Entry relationship identifying the observation as cause of death -->
            <entryRelationship typeCode="CAUS">
              <observation classCode="OBS" moodCode="EVN">
                <id root="6898fae0-5c8a-11db-b0de-0800200c9a66" />
                <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4" />
                <statusCode code="completed" />
                <value xsi:type="CD" code="419099009"
                  codeSystem="2.16.840.1.113883.6.96" displayName="Dead"
                  codeSystemName="SNOMED-CT" />
              </observation>
            </entryRelationship>
          </component>
        </subject>
      </organizer>
    </entry>
  </section>
</component>

```

```

<!-- Inverted entry relationship observation identifying the age at which
the condition occurred -->
  <entryRelationship typeCode="SUBJ" inversionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.1.38"/>
      <code code="397659008" codeSystem="2.16.840.1.113883.6.96"
displayName="Age"/>
      <statusCode code="completed"/>
      <value xsi:type="INT" value="57"/>
    </observation>
  </entryRelationship>
</observation>
</component>
<!-- Observation identifying condition of hypertension -->
<component>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.22"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.3"/>
    <id root="5bfe3ec0-5c8b-11db-b0de-0800200c9a66"/>
    <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>
    <statusCode code="completed"/>
    <value xsi:type="CD" code="59621000" codeSystem="2.16.840.1.113883.6.96"
displayName="HTN"/>
    <!-- Age observation -->
    <entryRelationship typeCode="SUBJ" inversionInd="true">
      <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.1.38"/>
        <code code="397659008" codeSystem="2.16.840.1.113883.6.96"
displayName="Age"/>
        <statusCode code="completed"/>
        <value xsi:type="INT" value="40"/>
      </observation>
    </entryRelationship>
  </observation>
</component>
</organizer>
</entry>
</section>
</component>

```

### 3.3.2.10. History of Past Illness

Section Code	LOINC: 11348-0 (HISTORY OF PAST ILLNESS)	
Description	The history of past illness section is used to capture the patient's past illnesses. It must contain a narrative and problem concern entries.	
CDA Level	Level 3 Only	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.8	IHE PCC TF-2: 6.3.3.2.5
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Problem Concern Entry	1.3.6.1.4.1.19376.1.5.3.1.4.5.2	3.4.2.20

OpenSHR Implementation Notes	
Data Model	Obs
Code File	HistoryOfPastIllnessSectionProcessor.java
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>
Notes	None
Specification	
<pre> &lt;component typeCode="COMP" contextConductionInd="true"&gt;   &lt;section classCode="DOCSECT" moodCode="EVN"&gt;     &lt;!-- IHE PCC History of Past Illness Template --&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.8"/&gt;     &lt;!-- 1..1 Section Code --&gt;     &lt;code code="11348-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"       displayName="HISTORY OF PAST ILLNESS"/&gt;     &lt;!-- 1..1 Title --&gt;     &lt;title&gt;History of Past Illness&lt;/title&gt;     &lt;!-- 1..1 Text (see general implementation notes for guidance) --&gt;     &lt;text&gt;       ...     &lt;/text&gt;     &lt;!-- 0..n Problem Concern Act entries --&gt;     &lt;entry typeCode="DRIV"&gt;       &lt;act classCode="ACT" moodCode="EVN"&gt;         &lt;/act&gt;       &lt;/entry&gt;     &lt;/section&gt;   &lt;/component&gt; </pre>	

### 3.3.2.11. Immunizations

Section Code	LOINC: 11369-6 (HISTORY OF IMMUNIZATIONS)	
Description	The Immunizations section is used to capture a history of immunizations given to the patient. It will contain a narrative of the immunizations given as well as substance administration entries for each vaccination.	
CDA Level	Level 3 Only	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD	2.16.840.1.113883.10.20.1.6	CCD 3.11
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.23	IHE PCC TF-2: 6.3.3.3.5
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Immunization	2.16.840.1.113883.10.20.1.24	3.4.2.13
	1.3.6.1.4.1.19376.1.5.3.1.4.12	
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	ImmunizationsSectionProcessor.java	
Additional Constraints	<ul style="list-style-type: none"> <li>OpenSHR will only process immunization entries and sections marked with the IHE PCC template identifier and will not process sections with only the CCD template identifier.</li> </ul>	

	<ul style="list-style-type: none"> <li>OpenSHR will only process immunizations with a moodCode=EVN (Event Occurrence), intent to administer vaccinations is not yet supported by OpenSHR</li> </ul>
Notes	The immunizations given should be identified with appropriate substanceAdministration entries. If the patient's immunization history is unknown solicitors may choose to send, and OpenSHR will send, a single substanceAdministration entry with SNOMED code 182904002 (Drug Treatment Unknown)

**Specification**

```

<component typeCode="COMP" contextConductionInd="true">
  <section classCode="DOCSECT" moodCode="EVN">
    <!-- HL7 CCD Template Identifier - Immunizations -->
    <templateId root="2.16.840.1.113883.10.20.1.6"/>
    <!-- IHE PCC Template Identifier - History of Immunizations -->
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.23"/>
    <!-- 1..1 Section Code-->
    <code code="11369-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
    displayName="HISTORY OF IMMUNIZATIONS"/>
    <!-- 1..1 Title -->
    <title language="en-US">...</title>
    <!-- 1..1 Text (See general implementation notes for guidance) -->
    <text mediaType="text/x-hl7-text+xml">
      ...
    </text>
    <!-- 0..n Substance Administration entries representing immunizations given -->
    <entry typeCode="DRIV" contextConductionInd="true">
      <substanceAdministration classCode="SBADM" moodCode="EVN">
        </substanceAdministration>
      </entry>
    </section>
  </component>

```

**Example**

*The following example illustrates a patient record whose only registered immunization was an influenza virus vaccine given via intramuscular injection sometime November 1999.*

```

<component typeCode="COMP" contextConductionInd="true">
  <section classCode="DOCSECT" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.6"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.23"/>
    <id root="d5ebb566-173b-45eb-8b5f-2585454ddd35"/>
    <code code="11369-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
    displayName="HISTORY OF IMMUNIZATIONS"/>
    <title language="en-US">History of Immunizations</title>
    <text mediaType="text/x-hl7-text+xml">
      ...
    </text>
    <entry typeCode="DRIV" contextConductionInd="true">
      <!-- Substance Administration - Immunization Procedure -->
      <substanceAdministration classCode="SBADM" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.1.24"/>
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.12"/>
        <!-- Unique identifier of the administration in the source system -->

```



```

<id root="1.2.3.4.5.3" extension="222"/>
<!-- Procedure code was immunization -->
<code code="IMMUNIZ" codeSystem="2.16.840.1.113883.5.4"
codeSystemName="ActCode" displayName="Immunization"/>
<text>
  <reference value="#obs684804cc"/>
</text>
<statusCode code="completed"/>
<!-- Immunization given sometime in November 1999-->
<effectiveTime xsi:type="SXCM_TS" value="199911"/>
<!-- Route code - Route of administration -->
<routeCode code="IM" codeSystem="2.16.840.1.113883.5.112"
codeSystemName="2.16.840.1.113883.5.112" displayName="Intramuscular injection">
  <originalText representation="TXT">Intramuscular injection</originalText>
</routeCode>
<!-- The drug that was administered -->
<consumable typeCode="CSM">
  <manufacturedProduct classCode="MANU">
    <templateId root="2.16.840.1.113883.10.20.1.53"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7.2"/>
    <!-- Drug administered - Influenza Virus Vaccine -->
    <manufacturedMaterial classCode="MMAT">
      <code code="88" codeSystem="2.16.840.1.113883.6.59" codeSystemName="HL-7
CVX" displayName="Influenza virus vaccine">
        <originalText representation="TXT" language="en-US">
          <reference value="#txt9428c829"/>
        </originalText>
      </code>
      <name>Influenza virus vaccine</name>
    </manufacturedMaterial>
  </manufacturedProduct>
</consumable>
</substanceAdministration>
</entry>
</section>
</component>

```

### 3.3.2.12. Medications

Section Code	LOINC: 10160-0 (HISTORY OF MEDICATION USE)	
Description	The medications section is intended to capture the current and past medication regimen that the patient is on. It contains a narrative description of the regimen as well as structured substanceAdministrations containing the individual medications, frequency of use, start/stop time, dosage, etc.	
CDA Level	Level 3 Only	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD	2.16.840.1.113883.10.20.1.8	CCD 3.9
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.3.19	IHE PCC TF-2: 6.3.3.3.1
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
Medications Entry	2.16.840.1.113883.10.20.1.24 1.3.6.1.4.1.19376.1.5.3.1.4.7	3.4.2.14

OpenSHR Implementation Notes	
Data Model	Obs
Code File	MedicationsSectionProcessor.java
Additional Constraints	<ul style="list-style-type: none"> <li>Solicitors should use the IHE PCC template identifier when submitting a medications section. Sections with only the CCD template identifier will not be processed by the CDA import module.</li> </ul>
Notes	The medications being taken or that were historically taken should be identified with appropriate substanceAdministration entries. If the patient's medication history is unknown solicitors may choose to send, and OpenSHR will send, a single substanceAdministration entry with SNOMED code 182904002 (Drug Treatment Unknown)
Specification	
<pre> &lt;component typeCode="COMP" contextConductionInd="true"&gt;   &lt;section classCode="DOCSECT" moodCode="EVN"&gt;     &lt;!-- HL7 CCD Template Identifier - Medications--&gt;     &lt;templateId root="2.16.840.1.113883.10.20.1.8"/&gt;     &lt;!-- IHE PCC Template Identifier - History of Medication Use --&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.19"/&gt;     &lt;!-- 1..1 Section Code--&gt;     &lt;code code="10160-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="HISTORY OF MEDICATION USE"/&gt;     &lt;!-- 1..1 Title --&gt;     &lt;title language="en-US"&gt;...&lt;/title&gt;     &lt;!-- 1..1 Text (See general implementation notes for guidance) --&gt;     &lt;text mediaType="text/x-hl7-text+xml"&gt;       ...     &lt;/text&gt;     &lt;!-- 0..n Substance Administration entries representing medications given --&gt;     &lt;entry typeCode="DRIV" contextConductionInd="true"&gt;       &lt;substanceAdministration classCode="SBADM" moodCode="EVN"&gt;         &lt;/substanceAdministration&gt;       &lt;/entry&gt;     &lt;/section&gt;   &lt;/component&gt; </pre>	
Example	
<p><i>This example illustrates a patient currently taking 2 puffs of Albuterol 4 times a day since July 2005, and is taking Plavix 75mg once daily.</i></p>	
<pre> &lt;component typeCode="COMP" contextConductionInd="true"&gt;   &lt;section classCode="DOCSECT" moodCode="EVN"&gt;     &lt;templateId root="2.16.840.1.113883.10.20.1.8"/&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.19"/&gt;     &lt;code code="10160-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="HISTORY OF MEDICATION USE"/&gt;     &lt;title language="en-US"&gt;History of Medication Use&lt;/title&gt;     &lt;text mediaType="text/x-hl7-text+xml"&gt;       ...     &lt;/text&gt;     &lt;!-- Substance Administration for Albuterol medication--&gt;     &lt;entry typeCode="DRIV" contextConductionInd="true"&gt;       &lt;substanceAdministration classCode="SBADM" moodCode="EVN"&gt; </pre>	

```

<templateId root="2.16.840.1.113883.10.20.1.24"/>
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7"/>
<id root="1.2.3.4.5.3" extension="166"/>
<text>
  <reference value="#obsc9fa5d60"/>
</text>
<statusCode code="completed"/>
<!-- Has been taken since July 2005 -->
<effectiveTime xsi:type="IVL_TS">
  <low value="200507"/>
</effectiveTime>
<!-- Taken every 6 h -->
<effectiveTime xsi:type="PIVL_TS" operator="A">
  <period unit="h" value="6"/>
</effectiveTime>
<!-- Route of administration - Oral -->
<routeCode code="ORNEB" codeSystem="2.16.840.1.113883.5.112"
codeSystemName="2.16.840.1.113883.5.112" displayName="inhalation, nebulization, oral">
  <originalText representation="TXT">inhalation, nebulization,
oral</originalText>
</routeCode>
<!-- 2 Puffs per dose -->
<doseQuantity unit="puffs" value="2"/>
<!-- Identifies the manner in which the medication is administered -->
<administrationUnitCode code="421759004" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT" displayName="Metered dose aerosol inhaler">
  <originalText representation="TXT" language="en-US">
    <reference value="#txt69b35fd1"/>
  </originalText>
</administrationUnitCode>
<!-- Consumable representing the medication drug -->
<consumable typeCode="CSM">
  <manufacturedProduct classCode="MANU">
    <templateId root="2.16.840.1.113883.10.20.1.53"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7.2"/>
    <manufacturedMaterial classCode="MMAT">
      <!-- RxNORM Code representing the drug, note this may include a dose -->
      <code code="307782" codeSystem="2.16.840.1.113883.6.88"
codeSystemName="RxNORM" displayName="Albuterol 0.09 MG/ACTUAT inhalant solution">
        <originalText representation="TXT" language="en-US">
          <reference value="#txt4e51a937"/>
        </originalText>
      </code>
      <name>Albuterol 0.09 MG/ACTUAT inhalant solution</name>
    </manufacturedMaterial>
  </manufacturedProduct>
</consumable>
</substanceAdministration>
</entry>
<!-- Another drug in the patient's regimen -->
<entry typeCode="DRIV" contextConductionInd="true">
  <substanceAdministration classCode="SBADM" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.24"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7"/>
    <id root="1.2.3.4.5.3" extension="173"/>
    <text>
      <reference value="#obs0c86d295"/>
    </text>
  </substanceAdministration>
</entry>

```

```

<statusCode code="completed"/>
<!-- Still being taken, unknown start time-->
<effectiveTime xsi:type="IVL_TS">
  <low nullFlavor="UNK"/>
  <high nullFlavor="UNK"/>
</effectiveTime>
<!-- Once per day -->
<effectiveTime xsi:type="PIVL_TS" operator="A">
  <period unit="h" value="24"/>
</effectiveTime>
<!-- Orally -->
<routeCode code="PO" codeSystem="2.16.840.1.113883.5.112"
codeSystemName="2.16.840.1.113883.5.112" displayName="Oral">
  <originalText representation="TXT">Oral</originalText>
</routeCode>
<!-- 75 mg dose -->
<doseQuantity unit="mg" value="75"/>
<administrationUnitCode code="421026006" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT" displayName="Tablet dose form">
  <originalText representation="TXT" language="en-US">
    <reference value="#txt38ea94ec"/>
  </originalText>
</administrationUnitCode>
<consumable typeCode="CSM">
  <manufacturedProduct classCode="MANU">
    <templateId root="2.16.840.1.113883.10.20.1.53"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7.2"/>
    <manufacturedMaterial classCode="MMAT">
      <code code="309362" codeSystem="2.16.840.1.113883.6.88"
codeSystemName="RxNORM" displayName="Clopidogrel 75 MG oral tablet">
        <originalText representation="TXT" language="en-US">
          <reference value="#txta9fdeeb1"/>
        </originalText>
        <translation code="174742" codeSystem="2.16.840.1.113883.6.88"
codeSystemName="RxNORM" displayName="Plavix"/>
      </code>
      <name>Plavix</name>
    </manufacturedMaterial>
  </manufacturedProduct>
</consumable>
</substanceAdministration>
</entry>
</section>
</component>

```

### 3.3.2.13. Pregnancy History

Section Code	LOINC: 10162-2 (HISTORY OF PREGNANCIES)	
Description	This section is used to capture information related to the patient's past pregnancies.	
CDA Level	3	
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / IHE	1.3.6.1.4.1.19376.1.5.3.1.1.5.3.4	PCC TF-2:6.3.3.2.18
Expected Entries / Sub-Sections		

Entry	Template ID	Reference
Pregnancy History Organizer	1.3.6.1.4.1.19376.1.5.3.1.4.13.5.1	
Pregnancy Observation	1.3.6.1.4.1.19376.1.5.3.1.4.13.5	3.4.2.19
OpenSHR Implementation Notes		
Data Model	Obs	
Code File	PregnancyHistorySectionProcessor.java	
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>	
Notes	None	
Specification		
<pre> &lt;component typeCode="COMP" contextConductionInd="true"&gt;   &lt;section&gt;     &lt;!-- Template ID for IHE History of Pregnancies --&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.5.3.4" /&gt;     &lt;!-- 1..1 Code identifying the section--&gt;     &lt;code code="10162-6" displayName="HISTORY OF PREGNANCIES" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" /&gt;     &lt;!-- 1..1 Text describing the section content --&gt;     &lt;text mediaType="text/x-hl7-text+xml"&gt;       ...     &lt;/text&gt;     &lt;!-- 0..n Pregnancy Observation Elements --&gt;     &lt;entry&gt;       &lt;observation classCode="OBS" moodCode="EVN"&gt;         &lt;/observation&gt;       &lt;/entry&gt;     &lt;!-- 0..n Pregnancy Organizer Elements --&gt;     &lt;entry&gt;       &lt;organizer classCode="CLUSTER" moodCode="EVN"&gt;         &lt;/organizer&gt;       &lt;/entry&gt;     &lt;/section&gt;   &lt;/component&gt; </pre>		
Example		
<p><i>The following example illustrates a pregnancy history section whereby the patient in question has had one single (non multiple) birth with a labor duration of 4 hours and birth weight of 2.9 kg</i></p>		
<pre> &lt;component typeCode="COMP" contextConductionInd="true"&gt;   &lt;section&gt;     &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.5.3.4" /&gt;     &lt;code code="10162-6" displayName="HISTORY OF PREGNANCIES" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" /&gt;     &lt;text mediaType="text/x-hl7-text+xml"&gt;       ...     &lt;/text&gt;     &lt;entry&gt;       &lt;observation classCode="OBS" moodCode="EVN"&gt;         &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13" /&gt;         &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.5" /&gt;         &lt;!-- Unique identifier for the observation --&gt; </pre>		

```

<id root="1.2.3.4.5.3" extension="166" />
<!-- Code for the births performed -->
<code code="11636-8" displayName="BIRTHS LIVE (REPORTED)"
codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" />
<statusCode code="completed" />
<effectiveTime value="2015" />
<!-- 1 previous live birth -->
<value value="1" xsi:type="INT" />
<interpretationCode code="N" />
</observation>
</entry>
<entry>
<!-- Information about the first pregnancy -->
<organizer classCode="CLUSTER" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.5.1"/>
<id root="1.2.3.4.5.3" extension="168" />
<code code="118185001" displayName="Pregnancy Finding" codeSystem="SNOMED CT"
codeSystemName="2.16.840.1.113883.6.96"/>
<statusCode code="completed"/>
<effectiveTime value="20150109"/>
<component typeCode="COMP">
<!-- Multiple birth not observed -->
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13" />
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.5" />
<id root="1.2.3.4.5.3" extension="169" />
<code code="45371-2" displayName="MULTIPLE BIRTH"
codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" />
<statusCode code="completed" />
<effectiveTime value="20150109" />
<value value="false" xsi:type="BL" />
</observation>
</component>
<component typeCode="COMP">
<!-- Labor duration of 4 hours -->
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13" />
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.5" />
<id root="1.2.3.4.5.3" extension="171" />
<code code="32396-4" displayName="LABOR DURATION"
codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" />
<statusCode code="completed" />
<effectiveTime value="20150109" />
<value value="4" unit="h" xsi:type="PQ" />
</observation>
</component>
<component typeCode="COMP">
<!-- Weight of infant -->
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13" />
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.5" />
<id root="1.2.3.4.5.3" extension="171" />
<code code="8339-4" displayName="BODY WEIGHT AT BIRTH"
codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" />
<statusCode code="completed" />
<effectiveTime value="20150109" />
<value value="2.9" unit="kg" xsi:type="PQ" />
</observation>

```

```

    </component>
  </organizer>
</entry>
</section>
</component>

```

### 3.3.2.14. Procedures

Section Code	LOINC:	
Description		
CDA Level		
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD		
2 / IHE		
3 / IHE		
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
OpenSHR Implementation Notes		
Data Model	Obs	
Code File		
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>	
Notes		
Specification		
Example		
<i>Example Description</i>		

### 3.3.2.15. Social History

Section Code	LOINC:	
Description		
CDA Level		
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD		
2 / IHE		
3 / IHE		
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
OpenSHR Implementation Notes		
Data Model	Obs	

Code File	
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>
Notes	
Specification	
Example	
<i>Example Description</i>	

### 3.3.2.16. Vital Signs

Section Code	LOINC:	
Description		
CDA Level		
Template IDs		
Level / Spec	Template ID	Standards Reference
3 / CCD		
2 / IHE		
3 / IHE		
Expected Entries / Sub-Sections		
Entry	Template ID	Reference
OpenSHR Implementation Notes		
Data Model	Obs	
Code File		
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>	
Notes		
Specification		
Example		
<i>Example Description</i>		

## 3.4. CDA Entry Templates

Introduce the entry templates

### 3.4.1. Entry Implementation Details

#### 3.4.1.1. Identifying Entries

Content creators shall append a unique identifier to every entry which they submit data to the OpenSHR. See section 3.1.1 "Identifiers" on page 12 for more information about identifiers.

#### 3.4.1.2. Replacing Entries

OpenSHR performs a discrete data import of all recognized entries within a clinical document. There may be occasion at a later time, to replace the contents of an entry with new data. In order to perform a



replace, content creators are expected to reference the replaced entry using a reference element within the entry body with a type code of RPLC (replaces). Figure 14 illustrates an example of how entry 21 replaces 12 from domain 1.2.3.4.5.

Figure 14 - Replacing an existing entry sample

```
<substanceAdministration classCode="SBADM" moodCode="EVN">
  ...
  <id root="1.2.3.4.5" extension="21"/>
  ...
  <reference typeCode="RPLC">
    <externalAct classCode="ACT" moodCode="EVN">
      <id root="1.2.3.4.5" extension="12"/>
    </externalAct>
  </reference>
</substanceAdministration>
```

### 3.4.1.3. Identifying the Author of an Entry

By default, whenever an entry is submitted, the authorship of the document applies to the entry as well (i.e. if Dr. Brown and Dr. Smith authored the document then Dr. Brown and Dr. Smith are assumed to have authored all entries). There arises situations, however, where this is not true (for example in a summary of care), and one entry needs to be attributed to a specific author found in the header. To do this, Content Creators shall indicate an author relationship within the entry containing, at minimum, the identifier of the author as it appears in the CDA header.

Content creators may, for clarity, include the complete authorship information in the entry. If this is done, Content Creators shall ensure that the data from the entry matches the data in the CDA header. Figure 15 provides an example of a substanceAdministration entry attributed to a particular author from the header.

Figure 15 - Identifying person/time of authorship of entry

```
<substanceAdministration classCode="SBADM" moodCode="EVN">
  ...
  <author typeCode="AUT" contextControlCode="OP">
    <time value="20101026130945.000-0400"/>
    <assignedAuthor classCode="ASSIGNED">
      <id root="1.2.3.4.5.6.7" extension="234"/>
      <id root="1.2.3.4.5.7" extension="7"/>
      <id root="1.2.3.4.5.10" extension="508"/>
      <addr nullFlavor="NI"/>
      <telecom nullFlavor="NI"/>
      <assignedPerson classCode="PSN" determinerCode="INSTANCE">
        <name>
          <family>Hibbert</family>
          <given>Julius</given>
        </name>
      </assignedPerson>
      <representedOrganization classCode="ORG" determinerCode="INSTANCE">
        <id root="1.2.3.4.5.8" extension="9"/>
        <name>Springfield General Hospital</name>
        <telecom nullFlavor="NI"/>
        <addr nullFlavor="NI"/>
      </representedOrganization>
    </author>
  </substanceAdministration>
```

```

    </representedOrganization>
  </assignedAuthor>
</author>
...
</substanceAdministration>

```

Additionally, the author/time element is used to describe the time that the observation was created. This differs from the effectiveTime which represents the time the entry was or is effective. If no author/time is provided in an entry the creation time of the document is used.

#### 3.4.1.4. Mood Codes

Mood codes are used in CDA to describe the mode in which a piece of data is represented. For example, there may be a need to represent that a procedure wasn't performed but "should" be performed sometime in the future. In CDA this is controlled by the "moodCode" attribute on an entry. Table 4 provides a series of moodCodes supported by OpenSHR and describes the semantic meaning of each.

Table 4 - OpenSHR Interpretation of Mood Codes

Mood Code	Supported Entries	Meaning
EVN	Observation Procedure SubstanceAdministration Organizer Act	The event "did" occur. For example, when OpenSHR encounters: <code>&lt;observation moodCode="EVN"&gt;</code> It is interpreted as "the author DID observe"
INT	Observation Procedure SubstanceAdministration	The event is "intended" to occur, i.e. it will occur. When OpenSHR encounters: <code>&lt;procedure moodCode="INT"&gt;</code> It is interpreted as "the author INTENDS to perform the procedure". In OpenMRS language, this represents an Order to do something.
PRP	Observation Procedure SubstanceAdministration	The event is a "proposal" that something should occur. For example: <code>&lt;observation moodCode="PRP"&gt;</code> It is interpreted as "the author PROPOSES to observe". This is common in care plans.

#### 3.4.1.5. Negation

Another important aspect of CDA documents is the idea of "negation". This is an important piece of semantic expression within a clinical document as it is used to indicate that something "did not". This is expressed as a "negationInd" attribute on entries and when encountered should be interpreted as a "not" occur. Figure 16 represents an observation indicating a patient is "NOT" pregnant.

Figure 16 - Example of negation

```

<observation classCode="OBS" moodCode="EVN" negationInd="true">
  ...
  <code code="418799008" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"
  displayName="Symptom"/>
  ...
  <value xsi:type="CD" code="77386006" codeSystem="2.16.840.1.113883.6.96"
  codeSystemName="SNOMED CT" displayName="Patient currently pregnant"/>

```

...  
</observation>

### 3.4.2. Implemented Entry Templates

Unlike sections, entries are only imported when OpenSHR has a registered handler for a particular entry type. Entries which carry unknown template identifiers result in an exception being thrown on import if and only if the entry is contained within a registered level 3 section handler.

Example: If an Advance Directive section is recognized by OpenSHR however an entry within that Advance Directive section is identified with a template identifier for which there are no handlers then the import will fail.

Outlines the CDA entries currently supported in OpenSHR.

#### 3.4.2.1. Advance Directive Observation

Template ID(s)	2.16.840.1.113883.10.20.1.17 (HL7 CCD 3.2.2.1) 1.3.6.1.4.1.19376.1.5.3.1.4.13.7 (IHE PCC CDA Suppl: 6.3.4.2.9)																																					
Description	The Advance Directive observation is used to convey information about a single advance directive which has been identified by the patient.																																					
RMIM Class	Observation																																					
<b>Expected Entry Relationships</b>																																						
Entry	Template ID	Reference																																				
Advance Directive Status	2.16.840.1.113883.10.20.1.37	3.4.2.2																																				
	2.16.840.1.113883.10.20.1.57																																					
<b>Profiled Elements</b>																																						
<b>Element</b>	<b>Notes</b>																																					
code [1..1] CE	<p>The code of the advance directive observation <b>MUST</b> be present and <b>SHOULD</b> be drawn from the following table of SNOMED codes.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>304251008</td> <td>Resuscitation</td> <td>Boolean</td> </tr> <tr> <td>52765003</td> <td>Intubation</td> <td>Boolean</td> </tr> <tr> <td>225204009</td> <td>IV Fluid and Support</td> <td>Boolean</td> </tr> <tr> <td>89666000</td> <td>CPR</td> <td>Boolean</td> </tr> <tr> <td>281789004</td> <td>Antibiotics</td> <td>Boolean</td> </tr> <tr> <td>78823007</td> <td>Life Support</td> <td>Boolean</td> </tr> <tr> <td>61420007</td> <td>Tube Feedings</td> <td>Boolean</td> </tr> <tr> <td>116859006</td> <td>Transfusion of blood product</td> <td>Boolean</td> </tr> <tr> <td>71388002</td> <td>Other Directive</td> <td>None</td> </tr> </tbody> </table> <p>Or from the following table of LOINC codes:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>xx-bld-transf-ok</td> <td>Blood Transfusion Ok</td> <td>Boolean</td> </tr> </tbody> </table>		Code	Description	Value	304251008	Resuscitation	Boolean	52765003	Intubation	Boolean	225204009	IV Fluid and Support	Boolean	89666000	CPR	Boolean	281789004	Antibiotics	Boolean	78823007	Life Support	Boolean	61420007	Tube Feedings	Boolean	116859006	Transfusion of blood product	Boolean	71388002	Other Directive	None	Code	Description	Value	xx-bld-transf-ok	Blood Transfusion Ok	Boolean
Code	Description	Value																																				
304251008	Resuscitation	Boolean																																				
52765003	Intubation	Boolean																																				
225204009	IV Fluid and Support	Boolean																																				
89666000	CPR	Boolean																																				
281789004	Antibiotics	Boolean																																				
78823007	Life Support	Boolean																																				
61420007	Tube Feedings	Boolean																																				
116859006	Transfusion of blood product	Boolean																																				
71388002	Other Directive	None																																				
Code	Description	Value																																				
xx-bld-transf-ok	Blood Transfusion Ok	Boolean																																				

effectiveTime [1..1] IVL	The effectiveTime element identifies the time range when the directive is to be enforced.
statusCode [1..1] CS	The statusCode element must be present and must be valued as "completed".
value [1..1] ANY	The value element must match the value indicated by the appropriate <code> value.
OpenSHR Implementation Notes	
Data Model	Obs
Code File	AdvanceDirectiveObservationEntryProcessor.java
Permitted Moods	EVN
Additional Constraints	<ul style="list-style-type: none"> <li>When &lt;code&gt; is set to "Other Directive" the use of "Value" is prohibited</li> <li>Advance directive code must be drawn from SNOMED-CT or must be exactly "xx-bld-transf-ok" if from LOINC.</li> <li>Advance directive must carry an advance directive status observation in an entryRelationship</li> </ul>
Notes	<ul style="list-style-type: none"> <li>APS templates require the presence of an advance directive indicating the consent to perform blood transfusion. If no directive has been recorded by a patient (i.e. no directives exist on their patient file) then OpenSHR will generate one for any ODD document requiring an Advance Directive. When this is the case, the value of the directive will be a null flavor of UNK and the author will point to the deployed instance of OpenSHR</li> </ul>
Example	
<p><i>The following example illustrates the patient has an active DNR (do not resuscitate) order attached to their information.</i></p>	
<pre>&lt;observation classCode="OBS" moodCode="EVN"&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.7"/&gt;   &lt;templateId root="2.16.840.1.113883.10.20.1.17"/&gt;   &lt;id root="4dce8759-e246-4eaa-be61-255b4ed6d57a"/&gt;   &lt;code code="304251008" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"   displayName="Resuscitation"/&gt;   &lt;text representation="TXT" language="en-US"&gt;     &lt;reference value="#obs317ef3a7"/&gt;   &lt;/text&gt;   &lt;statusCode code="completed"/&gt;   &lt;effectiveTime&gt;     &lt;high value="20140502"/&gt;   &lt;/effectiveTime&gt;   &lt;value xsi:type="BL" value="false"/&gt;   &lt;entryRelationship typeCode="REFR" contextConductionInd="true"&gt;     &lt;!-- See 3.4.2.2 for example of what goes here --&gt;   &lt;/entryRelationship&gt; &lt;/observation&gt;</pre>	
<p><i>The following example illustrates that the patient does not have a blood transfusion advance directive, or that the status of the advance directive for blood transfusion is not present. This is often appended</i></p>	

by OpenSHR as the APS template requires the presence of a blood transfusion order. Note the negation and nullFlavor of value to indicate no information (NI) is present.

```
<observation classCode="OBS" moodCode="EVN" negationInd="true">
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.7"/>
  <templateId root="2.16.840.1.113883.10.20.1.17"/>
  <code code="(xx-bld-transf-ok)" codeSystem="2.16.840.1.113883.6.1"
codeSystemName="LOINC" displayName="Blood Transfusion"/>
  <text representation="TXT" language="en-US">
    <reference value="#obs317ef3a7"/>
  </text>
  <statusCode code="completed"/>
  <effectiveTime>
    <high value="20141028095457.321-0600"/>
  </effectiveTime>
  <value xsi:type="BL" nullFlavor="NI"/>
  <entryRelationship typeCode="REFR" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.1.37"/>
      <templateId root="2.16.840.1.113883.10.20.1.57"/>
      <code code="33999-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Status"/>
      <text representation="TXT" language="en-US">
        <reference value="#obs8a4b3b73"/>
      </text>
      <statusCode code="completed"/>
      <value xsi:type="CD" nullFlavor="NI"/>
    </observation>
  </entryRelationship>
</observation>
```

### 3.4.2.2. Advance Directive Status Observation

Template ID(s)	2.16.840.1.113883.10.20.1.37 2.16.840.1.113883.10.20.1.57				
Description	The Advance Directive status observation is used to convey the status of an advance directive.				
RMIM Class	Observation				
Profiled Elements					
Element	Notes				
code [1..1] CE	The code element must carry code 33999-4 from LOINC code system				
effectiveTime [0..1] IVL	The effectiveTime element identifies the moment in time when the advance directive's status was changed				
statusCode [1..1] CS	The statusCode element must be present and must be valued as "completed".				
value [1..1] CD	The value of the advance directive status observation must be of type CD and must be drawn from the following SNOMED CT codes				
	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>425392003</td> <td>Current and Verified</td> </tr> </tbody> </table>	Code	Description	425392003	Current and Verified
Code	Description				
425392003	Current and Verified				

	425394002	Supported By Healthcare Will
	425393008	Supported By Durable Power of Attorney for Healthcare
	425396000	Verified With Family Only
	310305009	Verified By Medical Record Only
If the status is unknown, then the value must be present, and must carry an appropriate null flavor such as NI (no information) or UNK (unknown).		

OpenSHR Implementation Notes	
Data Model	Obs
Code File	StatusObservationEntryProcessor.java
Permitted Moods	EVN
Additional Constraints	<ul style="list-style-type: none"> <li>No additional constraints</li> </ul>

Example
<p>The following example represents an Advance Directive status observation which indicates that the advance directive is supported by the patient's legal Will.</p> <pre>&lt;observation classCode="OBS" moodCode="EVN"&gt;   &lt;templateId root="2.16.840.1.113883.10.20.1.37"/&gt;   &lt;templateId root="2.16.840.1.113883.10.20.1.57"/&gt;   &lt;code code="33999-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"   displayName="Status"/&gt;   &lt;text representation="TXT" language="en-US"&gt;     &lt;reference value="#obs8a4b3b73"/&gt;   &lt;/text&gt;   &lt;statusCode code="completed"/&gt;   &lt;value xsi:type="CD" code="425394002" codeSystem="2.16.840.1.113883.6.96"     displayName="Supported By Healthcare Will"/&gt; &lt;/observation&gt;</pre>

### 3.4.2.3. Allergies and Intolerances Concern

Template ID(s)	1.3.6.1.4.1.19376.1.5.3.1.4.5.1 (IHE PCC TF-2: 6.3.4.11) 1.3.6.1.4.1.19376.1.5.3.1.4.5.3 (IHE PCC TF-2: 6.4.3.13) 2.16.840.1.113883.10.20.1.27 (CCD 3.5.2.1)	
Description	The allergies and intolerances concern entry is a concern entry template related to the expression of an allergy or intolerance the patient is or did suffer.	
RMIM Class	Act	
Expected Entry Relationships		
Entry	Template ID	Reference
Allergy and Intolerances Observation	2.16.840.1.113883.10.20.1.28	3.4.2.4
	2.16.840.1.113883.10.20.1.18	
	1.3.6.1.4.1.19376.1.5.3.1.4.6	
	1.3.6.1.4.1.19376.1.5.3.1.4.5	
Profiled Elements		
Element	Notes	

code [1..1] CD	The code element shall be present and shall carry a nullFlavor of NA (Not Applicable)						
statusCode [1..1] CS	The status code must be present and must be valued as follows: <table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>active</td> <td>The concern is still being tracked and monitored.</td> </tr> <tr> <td>completed</td> <td>The problem, concern or medical state has been resolved and no longer needs to be monitored, except for historical purposes.</td> </tr> </tbody> </table>	Code	Description	active	The concern is still being tracked and monitored.	completed	The problem, concern or medical state has been resolved and no longer needs to be monitored, except for historical purposes.
Code	Description						
active	The concern is still being tracked and monitored.						
completed	The problem, concern or medical state has been resolved and no longer needs to be monitored, except for historical purposes.						
effectiveTime [1..1] IVL_TS	The effectiveTime element must be present and must carry a high and low element whereby low indicates the time the concern began (or nullFlavor if unknown) and high indicates the time when the concern was no longer active (or nullFlavor if unknown).						

**OpenSHR Implementation Notes**

Data Model	Allergy
Code File	AllergiesAndIntolerancesConcernEntryProcessor.java
Permitted Moods	EVN
Additional Constraints	<ul style="list-style-type: none"> <li>• Only active or suspended status codes are permitted in OpenSHR even though additional status codes are permitted in the IHE PCC documentation.</li> <li>• OpenSHR will calculate the status of a concern entry based on the value of effectiveTime</li> <li>• OpenSHR will map elements from the allergy/intolerance observation into the active list item where needed (severity, type of allergy, etc.). It is important that content creators accurately express allergies with an observation entry relationship.</li> <li>• If more than one entry relationship exists for the concern, then OpenSHR will map those to multiple Allergy items in the OpenMRS database.</li> </ul>

**Example**

*The following example illustrates a drug allergy to Aspirin. The allergy concern is active (still being monitored) and has no known start date.*

```
<entry typeCode="DRIV" contextConductionInd="true">
  <act classCode="ACT" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.3"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.1"/>
    <templateId root="2.16.840.1.113883.10.20.1.27"/>
    <code nullFlavor="NA"/>
    <statusCode code="active"/>
    <effectiveTime>
      <low nullFlavor="UNK"/>
    </effectiveTime>
    <entryRelationship typeCode="SUBJ" inversionInd="false"
contextConductionInd="true">
```

```

<observation classCode="OBS" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.1.28"/>
  <templateId root="2.16.840.1.113883.10.20.1.18"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.6"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
  <code code="DALG" codeSystem="2.16.840.1.113883.5.4"
codeSystemName="ObservationIntoleranceType" displayName="Drug Allergy"/>
  <text representation="TXT" language="en-US">
    <reference value="#obs9fc4cfd8"/>
  </text>
  <statusCode code="completed"/>
  <effectiveTime nullFlavor="UNK"/>
  <value xsi:type="CD" code="1191" codeSystem="2.16.840.1.113883.6.88"
codeSystemName="RxNORM" displayName="Aspirin">
    <originalText representation="TXT" language="en-US">
      <reference value="#txt2df7355f"/>
    </originalText>
  </value>
  <participant typeCode="CSM" contextControlCode="OP">
    <participantRole classCode="MANU">
      <playingEntity classCode="MMAT" determinerCode="INSTANCE">
        <code code="1191" codeSystem="2.16.840.1.113883.6.88"
codeSystemName="RxNORM" displayName="Aspirin">
          <originalText representation="TXT" language="en-US">
            <reference value="#txt2f4d0c7d"/>
          </originalText>
        </code>
        <name>Aspirin (1191)</name>
      </playingEntity>
    </participantRole>
  </participant>
</observation>
</entryRelationship>
</act>
</entry>

```

#### 3.4.2.4. Allergies and Intolerances Observation

Template ID(s)	2.16.840.1.113883.10.20.1.28 (CCD 3.5.2.1.2) 2.16.840.1.113883.10.20.1.18 (CCD 3.8.2.1) 1.3.6.1.4.1.19376.1.5.3.1.4.6 (IHE PCC TF-2: 6.4.3.15) 1.3.6.1.4.1.19376.1.5.3.1.4.5 (IHE PCC TF-2: 6.4.3.14)	
Description	The allergies and intolerances observation is used as a related entry for an Allergy and Intolerances Concern Entry. It is used to convey information about the agent, severity and class of allergen.	
RMIM Class	Observation	
<b>Expected Entry Relationships</b>		
<b>Entry</b>	<b>Template ID</b>	<b>Reference</b>
Severity Observation	1.3.6.1.4.1.19376.1.5.3.1.4.1	3.4.2.22
Manifestation Observation	1.3.6.1.4.1.19376.1.5.3.1.4.6.1	(See Below)
<b>Profiled Elements</b>		
<b>Element</b>	<b>Notes</b>	



code [1..1] CD	<p>The code element must be present and must be drawn from the code system 2.16.840.1.113883.5.4 (Observation Intolerance Type).</p> <table border="1" data-bbox="548 296 1344 772"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>ALG</td> <td>General Allergy</td> </tr> <tr> <td>OINT</td> <td>General Intolerance</td> </tr> <tr> <td>DALG</td> <td>Drug Allergy</td> </tr> <tr> <td>EALG</td> <td>Environmental Allergy</td> </tr> <tr> <td>FALG</td> <td>Food Allergy</td> </tr> <tr> <td>DINT</td> <td>Drug Intolerance</td> </tr> <tr> <td>EINT</td> <td>Environmental Intolerance</td> </tr> <tr> <td>FINT</td> <td>Food Intolerance</td> </tr> <tr> <td>DNAINT</td> <td>Drug non allergy intolerance</td> </tr> <tr> <td>ENAIN</td> <td>Environmental non allergy intolerance</td> </tr> <tr> <td>FNAINT</td> <td>Food nom allergy intolerance</td> </tr> </tbody> </table>	Code	Description	ALG	General Allergy	OINT	General Intolerance	DALG	Drug Allergy	EALG	Environmental Allergy	FALG	Food Allergy	DINT	Drug Intolerance	EINT	Environmental Intolerance	FINT	Food Intolerance	DNAINT	Drug non allergy intolerance	ENAIN	Environmental non allergy intolerance	FNAINT	Food nom allergy intolerance
Code	Description																								
ALG	General Allergy																								
OINT	General Intolerance																								
DALG	Drug Allergy																								
EALG	Environmental Allergy																								
FALG	Food Allergy																								
DINT	Drug Intolerance																								
EINT	Environmental Intolerance																								
FINT	Food Intolerance																								
DNAINT	Drug non allergy intolerance																								
ENAIN	Environmental non allergy intolerance																								
FNAINT	Food nom allergy intolerance																								
statusCode [1..1] CS	The status code must be present and must be valued as “completed”																								
effectiveTime [1..1] IVL_TS	The effectiveTime must be present and indicates the range of time in which the allergy observation is effective.																								
value [1..*] CD	The value must carry a concept descriptor (CD) valued which describes the adverse reaction or allergy.																								
participant [1..1]	The participant relationship will contain information related to the agent or substance which caused the allergic reaction or adverse event.																								
entryRelationship [0..*]	<p>Entry relationships with typeCode of MFST (Manifestation) and template id 1.3.6.1.4.1.19376.1.5.3.1.4.6.1 shall contain a problem entry describing the manifestation of the allergy (for example: hives, anaphylaxis, etc.). See 3.4.2.20 for more information.</p> <p>Entry relationships with a typeCode of SUBJ (SubjectOf), an inversionInd of true and an observation with template 1.3.6.1.4.1.19376.1.5.3.1.4.1 shall contain a severity observation describing the severity of the allergic reaction / manifestation.</p>																								
<b>OpenSHR Implementation Notes</b>																									
Data Model	Obs																								
Code File	AllergiesAndIntolerancesEntryProcessor.java																								
Permitted Moods	EVN																								
Additional Constraints	<ul style="list-style-type: none"> <li>IHE PCC constraints allow for value to carry textual information without a code, however due to OpenSHR’s data model this type of value is not permitted. It is recommended local coding schemes be used by content creators to express the value of the observation.</li> <li>IHE PCC permits additional entryRelationships on the allergy / intolerance observation which describe clinical status and</li> </ul>																								

comments, however these relationships are not supported by OpenSHR in the current release.

#### Example

*The following example illustrates a drug allergy to Penicillin active since January 15 2007. The allergy is severe and manifests itself as anaphylaxis.*

```
<observation classCode="OBS" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.1.28"/>
  <templateId root="2.16.840.1.113883.10.20.1.18"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.6"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
  <id root="7aea1b00-b972-48e8-acb6-adc0e9cef77b"/>
  <id root="1.2.3.4.5.3" extension="46"/>
  <code code="ALG" codeSystem="2.16.840.1.113883.5.4"
codeSystemName="ObservationIntoleranceType" displayName="Other Allergy"/>
  <text representation="TXT" language="en-US">
    <reference value="#obs5fecf51f"/>
  </text>
  <statusCode code="completed"/>
  <effectiveTime>
    <low value="20070115141530"/>
  </effectiveTime>
  <value xsi:type="CD" code="373270004" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT" displayName="Penicillin Allergy">
    <originalText representation="TXT" language="en-US">
      <reference value="#txt2f7efeb1"/>
    </originalText>
  </value>
  <participant typeCode="CSM" contextControlCode="OP">
    <participantRole classCode="MANU">
      <playingEntity classCode="MMAT" determinerCode="INSTANCE">
        <code code="373270004" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT" displayName="Penicillin">
          <originalText representation="TXT" language="en-US">
            <reference value="#txtdaa972ef"/>
          </originalText>
        </code>
        <name>Penicillin</name>
      </playingEntity>
    </participantRole>
  </participant>
  <entryRelationship typeCode="SUBJ" inversionInd="true" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.1"/>
      <templateId root="2.16.840.1.113883.10.20.1.55"/>
      <id root="54046e7f-692b-4aa6-bfdd-b91f7de095e3"/>
      <code code="SEV" codeSystem="2.16.840.1.113883.5.4" codeSystemName="ActCode"
displayName="Severity"/>
      <text representation="TXT" language="en-US">
        <reference value="#obsb7aa29ea"/>
      </text>
      <statusCode code="completed"/>
      <value xsi:type="CD" code="H" codeSystem="2.16.840.1.113883.5.1063"
codeSystemName="ObservationValue">
        <originalText representation="TXT" language="en-US">
```

```

    <reference value="#txt0ae2f10e"/>
  </originalText>
</value>
</observation>
</entryRelationship>
<entryRelationship typeCode="MFST" contextConductionInd="true">
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.6.1"/>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.54"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
    <templateId root="2.16.840.1.113883.10.20.1.28"/>
    <id root="853845cb-9f28-4185-a452-96153137e59b"/>
    <id root="1.2.3.4.5.3" extension="47"/>
    <code code="PROBLEM" codeSystem="1.3.6.1.4.1.19376.1.5.3.2"
codeSystemName="1.3.6.1.4.1.19376.1.5.3.2">
      <originalText representation="TXT" language="en-US">
        <reference value="#txtc8e29691"/>
      </originalText>
    </code>
    <text representation="TXT" language="en-US">
      <reference value="#obs8bcd9dfd"/>
    </text>
    <statusCode code="completed"/>
    <effectiveTime>
      <low value="20070115141530"/>
    </effectiveTime>
    <value xsi:type="CD" code="39579001" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT" displayName="Anaphylaxis">
      <originalText representation="TXT" language="en-US">
        <reference value="#txtb2fec89a"/>
      </originalText>
    </value>
  </observation>
</entryRelationship>
</observation>

```

*The following observation indicates that the patient is NOT allergic to Latex.*

```

<observation classCode="OBS" moodCode="EVN" negationInd="true">
  <templateId root="2.16.840.1.113883.10.20.1.28"/>
  <templateId root="2.16.840.1.113883.10.20.1.18"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.6"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
  <id root="b907fb72-4965-4eba-a938-63aefbe4c8bb"/>
  <code code="ALG" codeSystem="2.16.840.1.113883.5.4"
codeSystemName="ObservationIntoleranceType" displayName="Other Allergy"/>
  <text representation="TXT" language="en-US">
    <reference value="#obsa26f3ad7"/>
  </text>
  <statusCode code="completed"/>
  <effectiveTime>
    <low nullFlavor="UNK"/>
    <high nullFlavor="UNK"/>
  </effectiveTime>
  <value xsi:type="CD" code="300916003" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT" displayName="Latex">
    <originalText representation="TXT" language="en-US">

```

```

    <reference value="#txt5d678bd4"/>
  </originalText>
</value>
</observation>

```

### 3.4.2.5. Antenatal Testing and Surveillance Battery

Template ID(s)	1.3.6.1.4.1.19376.1.5.3.1.1.21.3.10 (IHE PCC CDA Suppl: 6.3.4.48)																															
Description	The antenatal testing and surveillance battery is used to express results from a single antenatal care visit. The single author and time of authorship is applied to all component observations.																															
RMIM Class	Organizer																															
Profiled Elements																																
Element	Notes																															
@classCode 1..1 CS	The class code attribute of the organizer must be present and must be valued with 'BATTERY'																															
code [1..1] CD	The code element must be present and must be valued with code XX-ANTENATALTESTINGBATTERY in code system LOINC.																															
statusCode [1..1] CS	The status code must be present and must carry code 'completed'																															
author [1..1]	The author and author/time elements are used to express the provider which observed/performed the tests described in the component observations.																															
component [1..*]	<p>The organizer shall contain one or more component observations adhering to the simple observation (see 3.4.2.23). All observations shall have a code drawn from the following table having the specified value type. Note all codes listed in the table are drawn from the LOINC code system.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>11630-1</td> <td>Biophysical profile. Amniotic fluid volume</td> <td>ED</td> </tr> <tr> <td>11631-9</td> <td>Biophysical profile. Body movement</td> <td>ED</td> </tr> <tr> <td>11632-7</td> <td>Biophysical profile. Breathing movement</td> <td>ED</td> </tr> <tr> <td>11633-5</td> <td>Biophysical profile. Heart rate reactivity</td> <td>ED</td> </tr> <tr> <td>11635-0</td> <td>Biophysical profile. Tone</td> <td>ED</td> </tr> <tr> <td>11634-3</td> <td>Biophysical profile. Sum</td> <td>ED</td> </tr> <tr> <td>35096-7</td> <td>Ultrasound morphologic</td> <td>ED</td> </tr> <tr> <td>49086-2</td> <td>Nuchal translucency screening</td> <td>ED</td> </tr> <tr> <td>51659-1</td> <td>Hbs1 Antigen</td> <td>ED</td> </tr> </tbody> </table>		Code	Description	Value	11630-1	Biophysical profile. Amniotic fluid volume	ED	11631-9	Biophysical profile. Body movement	ED	11632-7	Biophysical profile. Breathing movement	ED	11633-5	Biophysical profile. Heart rate reactivity	ED	11635-0	Biophysical profile. Tone	ED	11634-3	Biophysical profile. Sum	ED	35096-7	Ultrasound morphologic	ED	49086-2	Nuchal translucency screening	ED	51659-1	Hbs1 Antigen	ED
Code	Description	Value																														
11630-1	Biophysical profile. Amniotic fluid volume	ED																														
11631-9	Biophysical profile. Body movement	ED																														
11632-7	Biophysical profile. Breathing movement	ED																														
11633-5	Biophysical profile. Heart rate reactivity	ED																														
11635-0	Biophysical profile. Tone	ED																														
11634-3	Biophysical profile. Sum	ED																														
35096-7	Ultrasound morphologic	ED																														
49086-2	Nuchal translucency screening	ED																														
51659-1	Hbs1 Antigen	ED																														
OpenSHR Implementation Notes																																

Data Model	Obs (group / member obs)
Code File	AntenatalTestingAndSurveillanceBatteryEntryProcessor.java
Permitted Moods	EVN
Additional Constraints	<ul style="list-style-type: none"> <li>OpenSHR will accept either author/time or effectiveTime as the timestamp of the organizer.</li> </ul>

#### Example

The following example illustrates an antenatal testing battery which has one component observation describing the amniotic fluid volume as determined by ultrasound.

```
<organizer classCode="BATTERY" moodCode="EVN">
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.21.3.10"/>
  <code code="XX-ANTENATALTESTINGBATTERY" codeSystem="2.16.840.1.113883.6.1"/>
  <statusCode code="completed"/>
  <effectiveTime value="20141230"/>
  <component typeCode="COMP" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
      <id root="e79bc01f-86fe-4928-96f4-6ecf01ad496c"/>
      <code code="11630-1" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
        displayName="Fetal Biophysical profile.amniotic fluid volume US"/>
      <statusCode code="completed"/>
      <effectiveTime value="20141230155804.228-0500"/>
      <value xsi:type="ED" representation="TXT" language="en-US">...</value>
      <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
        codeSystemName="ObservationInterpretation"/>
    </observation>
  </component>
</organizer>
```

#### 3.4.2.6. Antepartum Flow sheet Battery

Template ID(s)	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.3.2 (IHE PCC CDA Suppl: 6.3.4.28)
Description	The antenatal flow sheet battery entry represents one line in the antepartum flow sheet.
RMIM Class	Organizer
Profiled Elements	
Element	Notes
@classCode 1..1 CS	The class code attribute of the organizer must be present and must be valued with 'BATTERY'
code [1..1] CD	The code element must be present and must be valued with code 57061-4 (Antepartum Flow sheet Panel) in code system LOINC.
statusCode [1..1] CS	The status code must be present and must carry code 'completed'
author [1..1]	The author and author/time elements are used to express the provider which observed/performed the tests described in the component observations.
component [1..*]	The organizer shall contain one or more component observations adhering to the simple observation (see 3.4.2.23). All observations shall have a code drawn from the following table having the specified value type. Note all codes listed in the table are drawn from the LOINC code system.

Code	Description	Value	Units / Value Set
11884-4	Gestational age Clinical.estimate	PQ	wk
57067-1 or 11727-5 (by US)	Fetal Body weight Estimated by palpation or Fetal weight estimated by US	PQ	g, kg
11881-0	Uterus Fundal height Tape measure	PQ	cm
11876-0 (by PE) or 11877-8 (by US)	Fetal presentation by palpitation or Fetal presentation US	CD	SNOMED CT Vertex (70028003) Breech (6096002) Transverse (73161006) Oblique (63750008) Compound (124736009) Brow (8014007) Face (21882006)
11948-7 or 57068-9	Fetal Heart rate US or Fetal Heart rate Auscultation	PQ	/min
57088-7	Fetal Movement - Reported	CO	SNOMED CT fetal movement activity (364755008) baby kicks a lot (276368003) baby not moving (276370007) reduced fetal movement (276369006) fetal movements present (289431008) fetal movements felt (268470003) fetal movements seen (169731002)
57069-7	Preterm labor symptoms	BL	

	11709-7 or 11785-3	DILATION-LEN-PT- CERVICAL CANAL.external os -QN- PALPATION or DILATION-LEN-PT- CERVICAL CANAL.external os-QN- US	PQ	cm
	11867-9	Effacement Cervix by palpitation	PQ	percent
	11961-0	Cervix [Length] US	PQ	cm
	8480-6	Systolic blood pressure	PQ	mmHg
	8462-4	Diastolic blood pressure	PQ	mmHg
	3141-9	Body weight Measured	PQ	g, kg
	1753-3	Albumin [Presence] in Urine	CO	SNOMED CT Negative (finding) CID 167273002 Trace (finding) CID 167274008 1+ (finding) CID 167275009 2+ (finding) CID 167276005 3+ (finding) CID 167277001 4+ (finding) CID 167278006
	2349-9 or 25428-4(test strip)	Glucose [Presence] in Urine or Glucose [Presence] in Urine by Test strip	CO	SNOMED CT Negative (finding) CID 167261002 Trace (finding) CID 167262009 1+ (finding) CID 167264005 2+ (finding) CID 167265006 3+ (finding) CID 167266007 4+ (finding) CID 167267003
	44966-0	Edema	CO	SNOMED CT Trace 44996-0 1+ pitting edema 420829009 2+ pitting edema 421605005

				3+ pitting edema 421346005 4+ pitting edema 421129002
	38208-5	Pain severity - Reported	CO	0 (no pain) : 10 (worst possible pain)

### OpenSHR Implementation Notes

Data Model	Obs (group / member obs)
Code File	AntepartumFlowsheetBatteryEntryProcessor.java
Permitted Moods	EVN
Additional Constraints	<ul style="list-style-type: none"> <li>OpenSHR will accept either author/time or effectiveTime as the timestamp of the organizer.</li> </ul>

### Example

*The following example illustrates an antepartum flow sheet panel containing several observations such as blood pressure, fetal presentation, movement and weight, preterm labor symptoms and pain severity. It is intended to provide a sample of each type of observation that can be placed within an antepartum flow sheet panel.*

```

<organizer classCode="BATTERY" moodCode="EVN">
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.11.2.3.2"/>
  <code code="57061-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
  displayName="Antepartum flow sheet panel"/>
  <statusCode code="completed"/>
  <effectiveTime value="20150103210300.791-0500"/>
  <component typeCode="COMP" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
      <id root="a577bb27-90aa-4bbf-a323-1d0616bae44b"/>
      <code code="57067-1" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
      displayName="Fetal Body weight Estimated by palpation"/>
      <statusCode code="completed"/>
      <effectiveTime value="20150103210300.807-0500"/>
      <value xsi:type="PQ" unit="g" value="900"/>
      <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
      codeSystemName="ObservationInterpretation"/>
    </observation>
  </component>
  <component typeCode="COMP" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
      <id root="d7911c3b-6775-462f-8089-280031d0e7f6"/>
      <code code="11876-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
      displayName="Fetal presentation by palpation"/>
      <statusCode code="completed"/>
      <effectiveTime value="20150103210300.807-0500"/>
      <value xsi:type="CD" code="21882006" codeSystem="2.16.840.1.113883.6.96"
      codeSystemName="SNOMED CT" displayName="Face Presentation"/>
      <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
      codeSystemName="ObservationInterpretation"/>
    </observation>
  </component>
</organizer>

```



```

    </observation>
  </component>
  <component typeCode="COMP" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
      <id root="cc2ba39e-5545-4740-b068-240a58f2d9e7"/>
      <code code="11948-7" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Fetal heart rate US"/>
      <statusCode code="completed"/>
      <effectiveTime value="20150103210300.807-0500"/>
      <value xsi:type="PQ" unit="/min" value="80"/>
      <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
codeSystemName="ObservationInterpretation"/>
    </observation>
  </component>
  <component typeCode="COMP" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
      <id root="b052933c-a909-41e9-9aa1-34b8e62a7f14"/>
      <code code="57088-7" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Fetal movement reported"/>
      <statusCode code="completed"/>
      <effectiveTime value="20150103210300.807-0500"/>
      <value xsi:type="CO" code="364755008" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT" displayName="fetal movement activity"/>
      <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
codeSystemName="ObservationInterpretation"/>
    </observation>
  </component>
  <component typeCode="COMP" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
      <id root="d436e51b-7a27-432f-9646-4ea100b47a66"/>
      <code code="57069-7" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Preterm labor symptoms"/>
      <statusCode code="completed"/>
      <effectiveTime value="20150103210300.807-0500"/>
      <value xsi:type="BL" value="false"/>
      <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
codeSystemName="ObservationInterpretation"/>
    </observation>
  </component>
  <component typeCode="COMP" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
      <id root="6a9226d9-1b43-4ee3-a87d-07af4889b4aa"/>
      <code code="8480-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Systolic blood pressure"/>
      <statusCode code="completed"/>
      <effectiveTime value="20150103210300.807-0500"/>
      <value xsi:type="PQ" unit="mm[Hg]" value="120"/>
      <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
codeSystemName="ObservationInterpretation"/>
    </observation>
  </component>
  <component typeCode="COMP" contextConductionInd="true">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>

```

```

<id root="b88ed3c6-7285-4a73-a341-9ab26942b87e"/>
<code code="8462-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Diastolic blood pressure"/>
<statusCode code="completed"/>
<effectiveTime value="20150103210300.807-0500"/>
<value xsi:type="PQ" unit="mm[Hg]" value="80"/>
<interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
codeSystemName="ObservationInterpretation"/>
</observation>
</component>
<component typeCode="COMP" contextConductionInd="true">
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
<id root="31fb1660-a177-4393-9e2f-16959a7df169"/>
<code code="1753-3" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Albumin [Presence] in Urine"/>
<statusCode code="completed"/>
<effectiveTime value="20150103210300.807-0500"/>
<value xsi:type="CO" code="167275009" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT" displayName="2+ (Finding)"/>
<interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
codeSystemName="ObservationInterpretation"/>
</observation>
</component>
<component typeCode="COMP" contextConductionInd="true">
<observation classCode="OBS" moodCode="EVN">
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
<id root="a3c4152b-692e-470e-b09f-5dd23bc847a9"/>
<code code="38208-5" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Pain severity - reported"/>
<statusCode code="completed"/>
<effectiveTime value="20150103210300.807-0500"/>
<value xsi:type="CO" value="2"/>
<interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"
codeSystemName="ObservationInterpretation"/>
</observation>
</component>
</organizer>

```

### 3.4.2.7. Estimated Delivery Date Observation

Template ID(s)	1.3.6.1.4.1.19376.1.5.3.1.1.11.2.3.1 (IHE PCC CDA Suppl: 6.3.4.27)
Description	The estimated delivery date observation entry is a simple observation which is used to express the date on which an attending physician estimates delivery. The observation also contains supporting observations for method of estimation.
RMIM Class	Observation
Profiled Elements	
Element	Notes
statusCode [1..1] CS	The statusCode element must be present and must carry the value "completed".
effectiveTime [1..1] TS	The effectiveTime element must be present and represents the time at which the estimation was made.

code [1..1] CD	The code element must be present and must be valued with code 11778-8 (DELIVERY DATE-TMSTP-PT-^PATIENT-QN-CLINICAL.ESTIMATED) in code system LOINC																			
value [1..1] TS	The value element must be present and must carry the date on which the pregnancy is expected to come to term. This value may be an interval as described in section 3.1.3.1.																			
entryRelationship [1..1]	<p>The first level entry relationship must be present, must have a typeCode of SPRT (Support) and must carry an Observation. The observation code must be drawn from the table below and must be valued with a date/time.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>11779-6</td> <td>Delivery date Estimated from last menstrual period</td> </tr> <tr> <td>(xx-EDD-by-PE)</td> <td>DELIVERY DATE-TMSTP-PT-^PATIENT-QN-ESTIMATED FROM CLINICIANS PHYSICAL EXAM</td> </tr> <tr> <td>11781-2</td> <td>Delivery date composite estimate</td> </tr> <tr> <td>57063-0</td> <td>Delivery date Estimated from quickening date</td> </tr> <tr> <td>57064-8</td> <td>Delivery date Estimated from date fundal height reaches umb</td> </tr> </tbody> </table>		Code	Description	11779-6	Delivery date Estimated from last menstrual period	(xx-EDD-by-PE)	DELIVERY DATE-TMSTP-PT-^PATIENT-QN-ESTIMATED FROM CLINICIANS PHYSICAL EXAM	11781-2	Delivery date composite estimate	57063-0	Delivery date Estimated from quickening date	57064-8	Delivery date Estimated from date fundal height reaches umb						
Code	Description																			
11779-6	Delivery date Estimated from last menstrual period																			
(xx-EDD-by-PE)	DELIVERY DATE-TMSTP-PT-^PATIENT-QN-ESTIMATED FROM CLINICIANS PHYSICAL EXAM																			
11781-2	Delivery date composite estimate																			
57063-0	Delivery date Estimated from quickening date																			
57064-8	Delivery date Estimated from date fundal height reaches umb																			
entryRelationship/ entryRelationship [1..1]	<p>The second nesting of entryRelationship may be present and should represent further supporting information which was used to form the estimate. The entryRelationship must contain an observation with a code and value type drawn from the table below:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>8655-2</td> <td>DATE LAST MENSTRUAL PERIOD-TMSTP-PT-^PATIENT-QN-REPORTED</td> <td>TS</td> </tr> <tr> <td>11884-4</td> <td>GESTATIONAL AGE-TIME-PT-^FETUS-QN-ESTIMATED FROM CLINICIANS PHYSICAL EXAM M</td> <td>PQ</td> </tr> <tr> <td>11888-5</td> <td>Gestational age composite estimate</td> <td>PQ</td> </tr> <tr> <td>57065-5</td> <td>Quickening date</td> <td>TS</td> </tr> <tr> <td>57066-3</td> <td>Date fundal height reaches umbilicus</td> <td>TS</td> </tr> </tbody> </table>		Code	Description	Value	8655-2	DATE LAST MENSTRUAL PERIOD-TMSTP-PT-^PATIENT-QN-REPORTED	TS	11884-4	GESTATIONAL AGE-TIME-PT-^FETUS-QN-ESTIMATED FROM CLINICIANS PHYSICAL EXAM M	PQ	11888-5	Gestational age composite estimate	PQ	57065-5	Quickening date	TS	57066-3	Date fundal height reaches umbilicus	TS
Code	Description	Value																		
8655-2	DATE LAST MENSTRUAL PERIOD-TMSTP-PT-^PATIENT-QN-REPORTED	TS																		
11884-4	GESTATIONAL AGE-TIME-PT-^FETUS-QN-ESTIMATED FROM CLINICIANS PHYSICAL EXAM M	PQ																		
11888-5	Gestational age composite estimate	PQ																		
57065-5	Quickening date	TS																		
57066-3	Date fundal height reaches umbilicus	TS																		
<b>OpenSHR Implementation Notes</b>																				
Data Model	Obs																			
Code File	EstimatedDeliveryDateObservationEntryProcessor.java																			
Permitted Moods	EVN																			
Additional Constraints	<ul style="list-style-type: none"> <li>No additional constraints</li> </ul>																			
<b>Example</b>																				
<p><i>The following example illustrates an estimated delivery date of June 2015 as estimated by last menstrual period sometime in September 2014.</i></p>																				
<pre>&lt;observation classCode="OBS" moodCode="EVN"&gt;   &lt;!-- EDD observation of June 2015 --&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/&gt;</pre>																				

```

<templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.11.2.3.1"/>
<id root="40a332f0-4a41-49b5-963c-bbebffd86d58"/>
<code code="11778-8" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
  displayName="Delivery date estimated"/>
<statusCode code="completed"/>
<effectiveTime value="20141230155804.212-0500"/>
<value xsi:type="TS" value="201506"/>
<!-- An entry relationship with supporting observation of last menstrual period
  of September 2014 -->
<entryRelationship typeCode="SPRT" contextConductionInd="true">
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
    <id root="9907e8c1-a117-4d8b-a602-84b656ba398a"/>
    <code code="11779-6" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
      displayName="Delivery date Estimated from last menstrual period"/>
    <statusCode code="completed"/>
    <effectiveTime value="20141230155804.212-0500"/>
    <value xsi:type="TS" value="201506"/>
    <entryRelationship typeCode="SPRT" contextConductionInd="true">
      <observation classCode="OBS" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13"/>
        <id root="55d88180-3ac3-4873-ac0f-6d34f7aafd5a"/>
        <code code="8655-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
          displayName="Date of last menstrual period - Patient provided"/>
        <statusCode code="completed"/>
        <effectiveTime value="20141230155804.228-0500"/>
        <value xsi:type="TS" value="201409"/>
      </observation>
    </entryRelationship>
  </observation>
</entryRelationship>
</observation>
</entryRelationship>
</observation>

```

### 3.4.2.8. External Reference

Template ID(s)	1.3.6.1.4.1.19376.1.5.3.1.4.4 (IHE PCC TF-2: 6.3.4.9)		
Description	The external reference entry is used to link data which is not contained in the current document, but may be located elsewhere (an entry in another document, etc.). Document references are identified by id rather than URI because some EMR systems may not support retrieval by url.		
RMIM Class	Act		
Profiled Elements			
Element	Notes		
id [1..1] II	References the act (reference) itself in the source system. If the source system does not identify references then a UUID can be used.		
code [1..1] CE	The code of the reference must be present and must carry the nullflavor NA.		
text [1..1] ED	The text element may be a pointer to the narrative text in the CDA narrative of this document.		
reference [1..1]	Represents the reference itself. The @typeCode of the document reference shall be drawn from table below:		
	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> </table>	Code	Description
Code	Description		

		SPRT	The referenced data is supporting information for the current context.
		REFR	The link is offered as reference material for the reader.
reference/ externalDocument/ id [1..1] II	The identifier for the referenced document.		
reference/ externalDocument/ text [0..1] ED	A link to the original document may be provided in the text element. It shall be a URL where the referenced document can be located and may also be present in the narrative as a <linkHTML> element.		
<b>OpenSHR Implementation Notes</b>			
Data Model	Obs		
Code File	ExternalReferencesEntryProcessor.java		
Permitted Moods	EVN		
Additional Constraints	<ul style="list-style-type: none"> <li>The RMIM relationship on the &lt;reference&gt; element must be an &lt;externalDocument&gt; element.</li> </ul>		

3.4.2.9. Family History Organizer

Template ID(s)	1.3.6.1.4.1.19376.1.5.3.1.4.15 (IHE PCC TF-2: 6.3.4.23)																				
Description	The family history organizer collects the family history (problems) related to a single family member related to the patient.																				
RMIM Class	Organizer																				
<b>Profiled Elements</b>																					
<b>Element</b>	<b>Notes</b>																				
subject [1..1]	Identifies the subject of the observations contained in the organizer (i.e. the family member to which the observation apply).																				
subject/ relatedSubject/ code [1..1] CE	<p>The code element shall be present and indicates the relationship of the family member to the patient. It should be drawn from codeSystem 2.16.840.1.113883.5.111 (HL7 RoleCode) and more specifically the FamilyMember vocabulary. A subset of the vocabulary is provided below:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Code</th> <th>Relationship</th> </tr> </thead> <tbody> <tr> <td>MTH</td> <td>Mother</td> </tr> <tr> <td>FTH</td> <td>Father</td> </tr> <tr> <td>GRMTH</td> <td>Grandmother</td> </tr> <tr> <td>GRFTH</td> <td>Grandfather</td> </tr> <tr> <td>SIB</td> <td>Sibling</td> </tr> <tr> <td>CHILD</td> <td>Child</td> </tr> <tr> <td>AUNT</td> <td>Aunt</td> </tr> <tr> <td>UNCLE</td> <td>Uncle</td> </tr> <tr> <td>PGRMTH</td> <td>Paternal Grandmother</td> </tr> </tbody> </table>	Code	Relationship	MTH	Mother	FTH	Father	GRMTH	Grandmother	GRFTH	Grandfather	SIB	Sibling	CHILD	Child	AUNT	Aunt	UNCLE	Uncle	PGRMTH	Paternal Grandmother
Code	Relationship																				
MTH	Mother																				
FTH	Father																				
GRMTH	Grandmother																				
GRFTH	Grandfather																				
SIB	Sibling																				
CHILD	Child																				
AUNT	Aunt																				
UNCLE	Uncle																				
PGRMTH	Paternal Grandmother																				

		MGRMTH	Maternal Grandmother
		PGRFTH	Paternal Grandfather
		MGRFTH	Maternal Grandfather
		SON	Son
		DAU	Daughter
		BRO	Brother
		SIS	Sister
		DOMPART	Domestic Partner
		FAMMEMB	Family Member
subject/ relatedSubject/ subject/ sdtc:id [0..1] 	The <stdc:id> element should be present and should identify the family member's demographic identifier.		
subject/ relatedSubject/ subject/ administrativeGenderCode [1..1] CS	The administrativeGenderCode element should be present and shall indicate the gender of the family member.		
component [1..*]	The family history organizer shall have one or more component observations of having template identifier of 1.3.6.1.4.1.19376.1.5.3.1.4.13.3 (Family History Observation) representing the family history conditions.		
<b>OpenSHR Implementation Notes</b>			
Data Model	Obs		
Code File	FamilyHistoryOrganizerEntryProcessor.java		
Permitted Moods	EVN		
Additional Constraints	<ul style="list-style-type: none"> <li>OpenSHR requires the use of administrativeGenderCode on the subject relation.</li> </ul>		
Notes	<ul style="list-style-type: none"> <li>OpenSHR will create in the OpenMRS database an obs group having concept id 160593 (Family History) with grouped observations representing family member information such as age (if known), conditions, etc.</li> </ul>		
<b>Example</b>			
<p><i>The following example illustrates a family history observation representing a patient's father. The father died of myocardial infarction at age 57 (illustrated by CAUS relationship) and was diagnosed with hypertension at age 40.</i></p>			
<pre>&lt;organizer moodCode="EVN" classCode="CLUSTER"&gt;   &lt;templateId root="2.16.840.1.113883.10.20.1.23"/&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.15"/&gt;   &lt;statusCode code="completed"/&gt;   &lt;subject&gt;</pre>			

```

    <relatedSubject classCode="PRS">
      <code code="FTH" codeSystem="2.16.840.1.113883.5.111" displayName="Biological
father"/>
    </relatedSubject>
    <subject>
      <sdtc:id xmlns:sdtc="urn:h17-org:sdtc" root="1.2.3.4.5" extension="12304"/>
      <administrativeGenderCode code="M" codeSystem="2.16.840.1.113883.5.1"
displayName="Male"/>
      <birthTime value="1912"/>
    </subject>
  </relatedSubject>
</subject>
<component>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.42"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.3"/>
    <id root="d42ebf70-5c89-11db-b0de-0800200c9a66"/>
    <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>
    <statusCode code="completed"/>
    <value xsi:type="CD" code="22298006" codeSystem="2.16.840.1.113883.6.96"
displayName="Myocardial infarction"/>
    <entryRelationship typeCode="CAUS">
      <observation classCode="OBS" moodCode="EVN">
        <id root="6898fae0-5c8a-11db-b0de-0800200c9a66"/>
        <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>
        <statusCode code="completed"/>
        <value xsi:type="CD" code="419099009" codeSystem="2.16.840.1.113883.6.96"
displayName="Dead"/>
      </observation>
    </entryRelationship>
    <entryRelationship typeCode="SUBJ" inversionInd="true">
      <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.1.38"/>
        <code code="397659008" codeSystem="2.16.840.1.113883.6.96"
displayName="Age"/>
        <statusCode code="completed"/>
        <value xsi:type="INT" value="57"/>
      </observation>
    </entryRelationship>
  </observation>
</component>
<component>
  <observation classCode="OBS" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.22"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.3"/>
    <id root="5bfe3ec0-5c8b-11db-b0de-0800200c9a66"/>
    <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>
    <statusCode code="completed"/>
    <value xsi:type="CD" code="59621000" codeSystem="2.16.840.1.113883.6.96"
displayName="Essential hypertension"/>
    <entryRelationship typeCode="SUBJ" inversionInd="true">
      <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.1.38"/>
        <code code="397659008" codeSystem="2.16.840.1.113883.6.96"
displayName="Age"/>
        <statusCode code="completed"/>
        <value xsi:type="INT" value="40"/>
      </observation>
    </entryRelationship>
  </observation>
</component>

```

```

</observation>
</component>
</organizer>

```

### 3.4.2.10. Family History Observation

Template ID(s)	1.3.6.1.4.1.19376.1.5.3.1.4.13.3 (IHE PCC TF-2: 6.3.4.57) 2.16.840.1.113883.10.20.1.22 (CCD 3.6.2.1)																	
Description	The family history observation entry is used to express a particular problem or condition experienced by a family member of the patient.																	
RMIM Class	Observation																	
Expected Entry Relationships																		
Entry	Template ID	Reference																
Age of Onset Observation	2.16.840.1.113883.10.20.1.38	3.4.2.11																
Cause of Death Observation	2.16.840.1.113883.10.20.1.42	3.4.2.12																
Profiled Elements																		
Element	Notes																	
code [1..1] CE	<p>The code element identifies the observation made for example an ASSERTION of an event or DIAGNOSIS of a condition. Some recommended codes from SNOMED:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>64572001</td> <td>Condition</td> </tr> <tr> <td>418799008</td> <td>Symptom</td> </tr> <tr> <td>404684003</td> <td>Finding</td> </tr> <tr> <td>409586006</td> <td>Complaint</td> </tr> <tr> <td>248536006</td> <td>Functional limitation</td> </tr> <tr> <td>55607006</td> <td>Problem</td> </tr> <tr> <td>282291009</td> <td>Diagnosis</td> </tr> </tbody> </table>		Code	Description	64572001	Condition	418799008	Symptom	404684003	Finding	409586006	Complaint	248536006	Functional limitation	55607006	Problem	282291009	Diagnosis
Code	Description																	
64572001	Condition																	
418799008	Symptom																	
404684003	Finding																	
409586006	Complaint																	
248536006	Functional limitation																	
55607006	Problem																	
282291009	Diagnosis																	
value [1..1] CD	The observed condition, problem, diagnosis, etc.																	
OpenSHR Implementation Notes																		
Data Model	Obs (Group)																	
Code File	FamilyHistoryOrganizerEntryProcessor.java																	
Permitted Moods	EVN																	
Additional Constraints	<ul style="list-style-type: none"> <li>None</li> </ul>																	
Example																		
<p><i>The following example illustrates a family history observation indicating Asthma.</i></p> <pre> &lt;observation classCode="OBS" moodCode="EVN"&gt;   &lt;templateId root="2.16.840.1.113883.10.20.1.22"/&gt;   &lt;!-- Family history observation template --&gt;   &lt;templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.3"/&gt;   &lt;id root="a13c6160-5c8b-11db-b0de-0800200c9a66"/&gt;   &lt;code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/&gt;   &lt;statusCode code="completed"/&gt;   &lt;effectiveTime&gt;     &lt;low value="1942"/&gt; </pre>																		



```

</effectiveTime>
  <value xsi:type="CD" code="195967001" codeSystem="2.16.840.1.113883.6.96"
  displayName="Asthma"/>
</observation>

```

### 3.4.2.11. Age Observation

Template ID(s)	2.16.840.1.113883.10.20.1.38 (CCD 3.6.2.4)
Description	The age observation is used, typically as an entryRelationship within another observation, to indicate the age of the subject when the observation was made.
RMIM Class	Observation
Profiled Elements	
Element	Notes
code [1..1] CE	The code element must be present and must have a code of 397659008 (Age) drawn from SNOMED-CT
statusCode [1..1] CS	The statusCode element must be present and must have a value of "completed"
value [1..1] CS	The value element must be present and must contain either an INT value (in years).
OpenSHR Implementation Notes	
Data Model	Obs
Code File	N/A
Permitted Moods	EVN
Notes	<ul style="list-style-type: none"> <li>The observation which is stored in OpenMRS' datastore will have concept id of 160617 (Age at diagnosis in years)</li> </ul>
Example	
<p>The following example illustrates an age observation of 40 years</p> <pre> &lt;observation classCode="OBS" moodCode="EVN"&gt;   &lt;templateId root="2.16.840.1.113883.10.20.1.38"/&gt;   &lt;code code="397659008" codeSystem="2.16.840.1.113883.6.96" displayName="Age"/&gt;   &lt;statusCode code="completed"/&gt;   &lt;value xsi:type="INT" value="57"/&gt; &lt;/observation&gt; </pre>	

### 3.4.2.12. Cause of Death Observation

Template ID(s)	2.16.840.1.113883.10.20.1.42 (CCD 3.6.2.1)
Description	The cause of death observation is used to identify that a particular condition contained within the family history section caused the death of the related family member.
RMIM Class	Observation
Profiled Elements	
Element	Notes
../entryRelationship/@typeCode	The typeCode element in the containing entryRelationship shall carry a value of CAUS (caused).

code [1..1] CE	The code value shall be present and shall carry a code of ASSERTION drawn from the HL7 ActCode (2.16.840.1.113883.5.4) code system.
statusCode [1..1] CS	The statusCode element shall be present and shall carry a value of "completed"
value [1..1] CD	The value element shall be present and shall carry a code of 419099009 (Dead) from code system SNOMED-CT

OpenSHR Implementation Notes	
Data Model	Obs
Code File	N/A
Permitted Moods	EVN
Notes	<ul style="list-style-type: none"> <li>The observation which is stored in OpenMRS' datastore will have concept id of 160592 (Family History Diagnosis) with value 160432 (Dead).</li> </ul>

### Example

*The following example illustrates a cause of death observation in context of a family history observation.*

```

<observation classCode="OBS" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.20.1.42"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.13.3"/>
  <id root="d42ebf70-5c89-11db-b0de-0800200c9a66"/>
  <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>
  <statusCode code="completed"/>
  <value xsi:type="CD" code="22298006" codeSystem="2.16.840.1.113883.6.96"
  displayName="Myocardial infarction"/>
  <entryRelationship typeCode="CAUS">
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.1.42"/>
      <id root="6898fae0-5c8a-11db-b0de-0800200c9a66"/>
      <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>
      <statusCode code="completed"/>
      <value xsi:type="CD" code="419099009" codeSystem="2.16.840.1.113883.6.96"
      displayName="Dead"/>
    </observation>
  </entryRelationship>
</observation>

```

#### 3.4.2.13. Immunizations

- 3.4.2.14. *Medications*
- 3.4.2.15. *Medications - Normal Dosing*
- 3.4.2.16. *Medications – Split Dosing*
- 3.4.2.17. *Medications – Tapered Dosing*
- 3.4.2.18. *Pregnancy History Organizer*
- 3.4.2.19. *Pregnancy Observation*
- 3.4.2.20. *Problem Concern*
- 3.4.2.21. *Procedure*
- 3.4.2.22. *Severity Observation*
- 3.4.2.23. *Simple Observation*
- 3.4.2.24. *Vital Signs Observation*
- 3.4.2.25. *Vital Signs Organizer*