Standard Name (short)	Standard Name (full)	Reference to Published Standard
CDAR2	HL7 CDA Release 2.0	http://www.hl7.org/documentcenter/private/standards/cda/r2/cda_r2_normativewebedition2010.zip
C-CDA	HL7 Implementation Guide for CDA® Release 2: IHE Health Story Consolidation, Release 1.1 - US Realm	http://www.hl7.org/implement/standards/product_brief.cfm?product_id=258
DICOM	NEMA PS3.16 – DICOM Part 16: Content Mapping Resource	ftp://medical.nema.org/medical/dicom/2009/09_16pu.pdf

6.3.2 Cath Report Content Header Element Constraints

The header for the Cardiac Report Content document shall support the following header constraints as noted in this section. Note that this content profile is realm agnostic. These header constraints are based on the C-CDA header constraints but all references to US Realm specific types have been removed.

1. **SHALL** contain exactly one [1..1] **typeId** (CONF:5361).
   a. This typeId **SHALL** contain exactly one [1..1] **@root**="2.16.840.1.113883.1.3" (CONF:5250).
   b. This typeId **SHALL** contain exactly one [1..1] **@extension**="POCD_HD000040" (CONF:5251).
2. **SHALL** contain exactly one [1..1] **templateId** (CONF:5252) such that it
   a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.1.2" for the Cath Report Content document template (CONF:CRC-xxx).
3. **SHALL** contain exactly one [1..1] **id** (CONF:5363).
   a. This id **SHALL** be a globally unique identifier for the document (CONF:9991).
4. **SHALL** contain exactly one [1..1] **code** (CONF:5253).
   a. This code **SHALL** contain exactly one [1..1] **@code**, which **SHALL** be selected from ValueSet ProcedureNoteDocumentTypeCodes 2.16.840.1.113883.11.20.6.1 **DYNAMIC** (CONF:17183). Either of the following codes should be included:

Value Set: ProcedureNoteDocumentTypeCodes 2.16.840.1.113883.11.20.6.1 DYNAMIC
Code System: LOINC 2.16.840.1.113883.6.1

LOINC Code	Type of Service 'Component'	Setting 'System'	Specialty/Training/Professional Level 'Method_Type'
18745-0	Study report	Heart	Cardiac catheterization
34896-1	Interventional procedure note	{Setting}	Cardiology

```
<componentOf>
  <encompassingEncounter>
     <id extension="KP00017" root="2.16.840.1.113883.19"/>
     <effectiveTime value=”20110407”/>
     <code code="1234097013" codeSystem="2.16.840.1.113883.6.96"
           codeSystemName="SNOMED CT"
           displayName="Diagnostic Coronary Angiography ">
     <location>
      <healthCareFacility>
        <id root=”1.2.3.4.5.6.7” extension=”facility ID”/>
        <code code=”CARD” codeSystem=”2.16.840.1.113883.5.111”
          codeSystemName=”roleCode” displayName=”Cardiology Clinic”>
        <serviceProviderOrganization>
           <name>My Favorite Cardiac Care Organization</name>
           <addr>
               <streetAddressLine>Healthcare Lane</streetAddressLine>
               <city>East Town</city>
               <state>OH</state>
               <country>US</country>
           </addr>
           <telecom value=”1-800-555-1212” use=”WP”/>
        </serviceProviderOrganization>
        <location>
           <name>My Cardiac Hospital</name>
           <addr>
               <streetAddressLine>Healthcare Lane</streetAddressLine>
               <city>East Town</city>
               <state>OH</state>
               <country>US</country>
           </addr>
        </location>
      </healthCareFacility>
    </location>
    <encounterParticipant typeCode=”REF”>
      <assignedEntity>
        <id root=”2.16.840.1.113883.4.6” extension=”12345”/>
        <code code=”xyz” codeSystem=”2.16.840.1.113883.6.101”
              codeSystemName=”nuccProviderCodes”
              displayName=”Referring cardiologist”/>
        <addr>Referring Physician Lane, USA</addr>
        <telecom value=”1-800-555-1212” use=”WP”/>
        <assignedPerson>
          <name>Dr. Referring Physician</name>
        </assignedPerson>
      </assignedEntity>
    </encounterParticipant>
  </encompassingEncounter >
</componentOf>
```

Figure 6.3.2-9: componentOf/encompassingEncounter example

16. **SHALL** contain exactly one [1..1] **documentationOf** (CONF:8510-CRC).

a. This documentationOf **SHALL** contain exactly one [1..1] **serviceEvent** (CONF:10061).
    i. The value of serviceEvent/code **SHOULD** be selected from SNOMED CT (codeSystem 2.16.840.1.113883.6.96) and **MAY** be selected from a localized procedure coding system for a given country such as ICD9 CM Procedures (codeSystem 2.16.840.1.113883.6.104) or CPT-4 (codeSystem 2.16.840.1.113883.6.12) in the U.S. (CONF:CRC-xxx).
    ii. This serviceEvent **SHALL** contain at least one [1..*] **id** values including the Study Instance UID used in the DICOM imaging data, with the UID value in the root attribute (CONF:CRC-xxx).
    iii. This serviceEvent **SHALL** contain exactly one [1..1] **effectiveTime** (CONF:10062).
        1. This effectiveTime **SHALL** contain exactly one [1..1] **low** (CONF:26449).
        2. If a width is not present, the serviceEvent/effectiveTime **SHALL** include effectiveTime/high. (CONF:8514)
        3. When only the date and the length of the procedure are known a width element **SHALL** be present and the effectiveTime/high **SHALL** not be present. (CONF:8515).
        4. The effectiveTime **SHALL** be accurate to the day and **MAY** be accurate to the second (CONF:CRC-xxx).
    iv. This serviceEvent **SHALL** contain at least one [1..*] **performer** (CONF:8520-CRC) such that it
        1. **SHALL** contain one or two [1..2] **@typeCode**="PPRF" Primary Performer (CodeSystem: `HL7ParticipationType 2.16.840.1.113883.5.90`). This is for the case where both a cath and PCI are performed in the same procedure. (CONF:8521-CRC).
        2. **SHALL** contain exactly one [1..1] **assignedEntity** (CONF:14911).
            a. This assignedEntity **SHOULD** contain zero or one [0..1] **code** (CONF:14912).
                i. The code, if present, **SHOULD** contain zero or one [0..1] **@code**. (CONF:14913-CRC).
        3. Any assistants **SHALL** be identified and **SHALL** be identified as secondary performers (SPRF). (CONF:8524).


```
<documentationOf>
  <serviceEvent classCode="PROC">
    <code code="70051019" codeSystem="2.16.840.1.113883.6.96"
         codeSystemName="SNOMED CT"
         displayName="Diagnostic catheterization"/>
    <id root="DICOM study instance UID" extension=”acc1”/>
    <effectiveTime>
      <low value="201003292240" />
      <width value="15" unit="m"/>
    </effectiveTime>
    <performer typeCode="PPRF">
      <assignedEntity>
        <id extension="IO00017" root="2.16.840.1.113883.19.5" />
        <code code="17561000"
            codeSystem="2.16.840.1.113883.6.96"
            codeSystemName="SNOMED CT"
            displayName="Cardiologist" />
        <addr>
          <streetAddressLine>1001 Hospital Lane</streetAddressLine>
          <city>Ann Arbor</city>
          <state>MI</state>
          <postalCode>99999</postalCode>
          <country>US</country>
        </addr>
        <telecom value="tel:(999)555-1212" />
        <assignedPerson>
          <name>
            <prefix>Dr.</prefix>
            <given>Tony</given>
            <family>Tum</family>
          </name>
        </assignedPerson>
      </assignedEntity>
    </performer>
  </serviceEvent>
</documentationOf>
```

Figure 6.3.2-10: documentationOf/serviceEvent example

6.3.3 Cath Report Content Body Containment

The body for the Cardiac Report Content document shall include section content modules. The section content modules will be specified by a set of constraints.

1. **SHALL** contain exactly one [1..1] **component** (CONF:9588).
    a. A Cath Report Content **SHALL** have a **structuredBody** (CONF:9589-CRC).
        i. A Cath Report Content document **SHALL** conform to CDA Level 3 (structuredBody containing sections that contain a narrative block and coded entries). In this template (templateId 1.3.6.1.4.1.19376.1.4.1.1.2), some coded entries are used. (CONF:9590-CRC).

b. The component/structuredBody **SHALL** conform to the section constraints below (CONF:9595-CRC).
    i. Each section **SHALL** have a **`title`** and the **`title`** **SHALL NOT** be empty (CONF:9937).

Table 6.3.3-1 identifies the set of specific *section content modules* that may be required, recommended, or allowed to be included in the CRC document. This table also identifies the most important *entry content modules* contained within those section content modules. The containment relationship among the section and entry content modules in the body of a Cath Report Content document is represented in the "Template Title" column as noted by the indentation relative to the other content modules.

1. Section content modules
    a. Any section content module that is used exactly as specified in C-CDA shall not have the C-CDA constraints replicated in this specification.
    b. If the section content module is used in this profile but with different vocabulary constraints, then the vocabulary constraints shall be listed in the "Constraints" columns of the table and shall be included in this specification.
    c. Sample XML shall be included for each section content module and should include XML for each entry contained within the section.
2. Entry content modules
    a. Any entry content module that is used exactly as specified in C-CDA shall not have the specific constraints replicated in this specification.
    b. If the entry content module is relevant to this CRC profile, it shall be included in table 6.3.3-1 following the section content module it is contained within.
    c. If the entry content module has CRC specific vocabulary constraints, the constraints shall be identified in the "Constraints" columns of the table and shall be documented in this specification.
    d. Sample XML should be included for the entries within the section content module where it is used.

Table 6.3.3-1: Template Containment for a Cath Report Content document

Template Title	Cardinality	Template Type	templateId	Specification Document	Constraints
Cath Report Content	R[1..1]	document	1.3.6.1.4.1.19376.1.4.1.1.2	CARD TF-3 6.3	
Document Summary Section	O[0..1]	section	1.3.6.1.4.1.19376.1.4.1.2.16	CARD TF-3 6.3.4.1	CARD TF-3 6.3.4.1

Template Title	Cardinality	Template Type	templateId	Specification Document	Constraints
Medical History - Cardiac Section	R[1..1]	section	1.3.6.1.4.1.19376.1.4.1.2.17	CARD TF-3 6.3.4.2 (C-CDA 4.31 - parent)	CARD TF-3 6.3.4.2
Procedure Activity Observation	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.13	C-CDA 5.62	CARD TF-3 6.3.4.2.2
Procedure Activity Procedure	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.14	C-CDA 5.63	CARD TF-3 6.3.4.2.3
Problem Observation - Cardiac	O[0..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.9	CARD TF-3 6.3.5.1 (C-CDA 5.59 – parent)	CARD TF-3 6.3.4.2.1
Age Observation	O[0..1]	entry	2.16.840.1.113883.10.20.22.4.31	C-CDA 5.3	
Health Status Observation	O[0..1]	entry	2.16.840.1.113883.10.20.22.4.5	C-CDA 5.30	
Problem Status	O[0..1]	entry	2.16.840.1.113883.10.20.22.4.6	C-CDA 5.60	
Severity Observation	O[0..1]	entry	2.16.840.1.113883.10.20.22.4.8	C-CDA 5.74	
Allergies Section	R[1..1]	section	2.16.840.1.113883.10.20.22.2.6	C-CDA 4.2	CARD TF-3 6.3.4.3
Allergy Problem Act	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.30	C-CDA 5.5	
Allergy – Intolerance Observation	R[1..*]	entry	2.16.840.1.113883.10.20.22.4.7	C-CDA 5.4	CARD TF-3 6.3.4.3.1
Allergy Status Observation	O[0..1]	entry	2.16.840.1.113883.10.20.22.4.28	C-CDA 5.6	
Reaction Observation	O[0..1]	entry	2.16.840.1.113883.10.20.22.4.9	C-CDA 5.68	
Severity Observation	O[0..1]	entry	2.16.840.1.113883.10.20.22.4.8	C-CDA 5.74	
Family History Section	O[0..1]	section	2.16.840.1.113883.10.20.22.2.15	C-CDA 4.12	CARD TF-3 6.3.4.4
Family History Organizer	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.45	C-CDA 5.26	
Family History Observation	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.46	C-CDA 5.25	CARD TF-3 6.3.4.4.1
Social History Section	O[0..1]	section	2.16.840.1.113883.10.20.22.2.17	C-CDA 4.57	CARD TF-3 6.3.4.5
Social History Observation	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.38	C-CDA 5.76	CARD TF-3 6.3.4.5.1
Smoking Status Observation	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.78	C-CDA 5.75	
Physical Exam Section	R[1..1]	section	2.16.840.1.113883.10.20.2.10	C-CDA 4.38	CARD TF-3 6.3.4.6
Vital Signs Section	R[1..1]	section	2.16.840.1.113883.10.20.22.2.4	C-CDA 4.60	CARD TF-3 6.3.4.7

Template Title	Cardinality	Template Type	templateId	Specification Document	Constraints
Vital Signs Organizer	R[1..*]	entry	2.16.840.1.113883.10.20.22.4.26	C-CDA 5.82	
Vital Sign Observation	R[2..*]	entry	2.16.840.1.113883.10.20.22.4.27	C-CDA 5.81	CARD TF-3 6.3.4.7.1
Pre-Procedure Results – Cardiac Section	R[1..1]	section	1.3.6.1.4.1.19376.1.4.1.2.23	CARD TF-3 6.3.4.8 (C-CDA 4.55 – parent)	CARD TF-3 6.3.4.8
Result Organizer - Cardiac	R[1..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.11	CARD TF-3 6.3.4.8.1 (C-CDA 5.71 – parent)	CARD TF-3 6.3.4.8.1
Result Observation	R[1..*]	entry	2.16.840.1.113883.10.20.22.4.2	C-CDA 5.70	CARD TF-3 6.3.4.8.2
Planned Procedure Section	R[1..1]	section	2.16.840.1.113883.10.20.22.2.30	C-CDA 4.40	CARD TF-3 6.3.4.9
Plan of Care Activity Procedure	R[1..2]	entry	2.16.840.1.113883.10.20.22.4.41	C-CDA 5.49	
Procedure Indications Section	R[1..1]	section	2.16.840.1.113883.10.20.22.2.29	C-CDA 4.50	CARD TF-3 6.3.4.10
Indication	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.19	C-CDA 5.37	CARD TF-3 6.3.4.10.1
Anesthesia Section	O[0..1]	section	2.16.840.1.113883.10.20.22.2.25	C-CDA 4.3	CARD TF-3 6.3.4.11
Procedure Activity Procedure	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.14	C-CDA 5.49	CARD TF-3 6.3.4.11.1
Medication Activity	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.16	C-CDA 5.39	

Template Title	Cardinality	Template Type	templateId	Specification Document	Constraints
Medications Administered Section	R[1..1]	section	2.16.840.1.113883.10.20.22.2.38	C-CDA 4.32	CARD TF-3 6.3.4.12
Medication Activity	R[1..*]	entry	2.16.840.1.113883.10.20.22.4.16	C-CDA 5.39	
Medication Information	R[1..*]	entry	2.16.840.1.113883.10.20.22.4.23	C-CDA 5.41	CARD TF-3 6.3.4.12.1
Procedure Description - Cardiac Section	R[1..1]	section	1.3.6.1.4.1.19376.1.4.1.2.19	CARD TF-3 6.3.4.13 (C-CDA 4.45 – parent)	CARD TF-3 6.3.4.13
Lesion Observation	O[0..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.10	CARD TF-3 6.3.5.2	
Procedure Device Organizer - Cardiac	O[0..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.12	CARD TF-3 6.3.4.13.2	CARD TF-3 6.3.4.13.2
Device Observation	R[1..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.13	CARD TF-3 6.3.4.13.3	CARD TF-3 6.3.4.13.3
Procedure Activity Procedure - Cardiac	R[1..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.14	CARD TF-3 6.3.4.13.1 (C-CDA 5.63 – parent)	CARD TF-3 6.3.4.13.1
Lesion Observation	O[0..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.10	CARD TF-3 6.3.5.2	
Product Instance	O[1..*]	entry	2.16.840.1.113883.10.20.22.4.37	C-CDA 5.65	
Procedure Device Organizer - Cardiac	O[0..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.12	CARD TF-3 6.3.4.13.2	CARD TF-3 6.3.4.13.2
Device Observation	R[1..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.13	CARD TF-3 6.3.4.13.3	CARD TF-3 6.3.4.13.3
Procedure Specimens Taken Section	O[0..1]	section	2.16.840.1.113883.10.20.22.2.31	C-CDA 4.51	CARD TF-3 6.3.4.14
Procedure Disposition Section	R[1..1]	section	2.16.840.1.113883.10.20.18.2.12	C-CDA 4.46	CARD TF-3 6.3.4.15
Procedure Results - Cardiac Section	R[1..1]	section	1.3.6.1.4.1.19376.1.4.1.2.20	CARD TF-3 6.3.4.16 (C-CDA 4.48 – parent)	CARD TF-3 6.3.4.16
Procedure Results Organizer - Cardiac	R[1..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.15	CARD TF-3 6.3.4.16.1 (C-CDA 5.71 – parent)	
Result Observation - Cardiac	R[1..*]	entry	1.3.6.1.4.1.19376.1.4.1.4.16	CARD TF-3 6.3.4.16.2 (C-CDA 5.70 – parent)	

Template Title	Cardinality	Template Type	templateId	Specification Document	Constraints
Severity Observation	O[0..1]	entry	2.16.840.1.113883.10.20.22.4.8	C-CDA 5.74	
Complications Section	R[1..1]	section	2.16.840.1.113883.10.20.22.2.37	C-CDA 4.8	CARD TF-3 6.3.4.17
Problem Observation	O[0..*]	entry	2.16.840.1.113883.10.20.22.4.4	C-CDA 5.59	CARD TF-3 6.3.4.17.1
Postprocedure Diagnosis Section	R[1..1]	section	2.16.840.1.113883.10.20.22.2.36	C-CDA 4.42	CARD TF-3 6.3.4.18
Postprocedure Diagnosis	R[1..1]	entry	2.16.840.1.113883.10.20.22.4.51	C-CDA 5.53	
Problem Observation	R[1..*]	entry	2.16.840.1.113883.10.20.22.4.4	C-CDA 5.59	CARD TF-3 6.3.4.18.1
Plan of Care – Cardiac Section	O[0..1]	section	1.3.6.1.4.1.19376.1.4.1.2.22	CARD TF-3 6.3.4.19 (C-CDA 4.39 - parent)	CARD TF-3 6.3.4.19
Plan of Care Activity Act - Cardiac	R[1..1]	entry	1.3.6.1.4.1.19376.1.4.1.4.17	CARD TF-3 6.3.4.19.1 (C-CDA 5.46 – parent)	CARD TF-3 6.3.4.19.1
Key Images – Cardiac Section	O[0..1]	section	1.3.6.1.4.1.19376.1.4.1.2.21	CARD TF-3 6.3.4.20	CARD TF-3 6.3.4.20
Sop Instance Observation	R[1..*]	entry	2.16.840.1.113883.10.20.6.2.8	C-CDA 5.77	
DICOM Object Catalog Section	O[0..1]	section	2.16.840.1.113883.10.20.6.1.1	C-CDA 4.9	
Study Act	R[1..*]	entry	2.16.840.1.113883.10.20.6.2.6	C-CDA 5.78	
Series Act	R[1..*]	entry	2.16.840.1.113883.10.20.6.4.63	C-CDA 5.72	
Sop Instance Observation	R[1..*]	entry	2.16.840.1.113883.10.20.6.2.8	C-CDA 5.77	

6.3.4 Cath Report Content Document Section/Entry Constraints

6.3.4.1 Document Summary Section 55112-7

[section: templateId 1.3.6.1.4.1.19376.1.4.1.2.16 (open)]

The Document Summary section content module includes a summary of most significant aspects of the procedures in a narrative form. It is a condensed form of the full narrative report whose structure has no constraint.

This Document Summary section content module is a new content module that has no equivalent in C-CDA. The complete set of constraints for the Document Summary section content module are listed below.

1. **SHALL** contain exactly one [1..1] **templateId** (CONF:CRC-xxx) such that it
   a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.2.16" (CONF:CRC-xxx).
2. **SHALL** contain exactly one [1..1] **code** (CONF:CRC-xxx).
   a. This code **SHALL** contain exactly one **@code**="55112-7" Document Summary (CodeSystem: LOINC 2.16.840.1.113883.6.1) (CONF:CRC-xxx).
3. **SHALL** contain exactly one [1..1] **title** (CONF:CRC-xxx).
4. **SHALL** contain exactly one [1..1] **text** (CONF:CRC-xxx).
   a. The text element **MAY** contain one or more **renderMultiMedia** element representing an in-line graphic. The related observationMedia entry may be within the summary section structured entries or may be referenced from another section.
5. **MAY** contain zero or more [0..*] **entry** (CONF:CRC-xxx) such that it
   a. **SHALL** contain exactly one [1..1] **ObservationMedia** element (CONF:CRC-xxx) such that it
      i. **SHALL** contain exactly one [1..1] **@classCode**="OBS" (CONF:CRC-xxx).
      ii. **SHALL** contain exactly one [1..1] **@moodCode**="EVN" Event (CodeSystem: ActMood 2.16.840.1.113883.5.1001) (CONF:CRC-xxx).
      iii. **SHALL** contain at least one [1..*] **id** (CONF:CRC-xxx).
      iv. **SHALL** contain at least one [1..*] **value** with @xsi:type="ED" (CONF:CRC-xxx)
         1. This value **SHALL** contain exactly one [1..1] **@mediaType** drawn from the ValueSet SupportedFileFormats 1.3.6.1.4.1.19376.1.4.1.5.45 **STATIC** (CONF:CRC-xxx).
         2. This value **MAY** contain zero or one [0..1] **reference** (CONF:CRC-xxx).
            a. The URL of a referenced graphic element **MAY** be present (CONF:CRC-xxx).
         3. An encapsulated data value may have both inline data and a reference. The reference must point to the same data as provided inline as per HL7 v3 Data Types – Abstract Specification, Release 1, Section 2.4.5 (CONF:CRC-xxx).

```
<!-- example with external content referenced by file name -->
<section>
    <templateId root="1.3.6.1.4.1.19376.1.4.1.2.16"/>
    <code codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
        code="55112-7" displayName="DOCUMENT SUMMARY"/>
    <title>CATH PROCEDURE SUMMARY</title>
    <text>
      <paragraph>A cath procedure was performed. The following image shows the
region of interest.</paragraph>
       <renderMultiMedia referencedObject="CRC-image1"/>
      <paragraph>The patient needed no further interventions.</paragraph>
    </text>
    <entry>
      <observationMedia classCode="OBS" moodCode="EVN" ID="CRC-image1">
         <id root="2.16.840.1.113883.19.2.1"/>
         <value xsi:type="ED" mediaType="image/jpeg">
            <reference value="sample cath image.jpeg"/>
         </value>
      </observationMedia>
    </entry>
</section>

<!-- alternative example - embed the content within the reference element value
attribute -->
<section>
    …
    <text mediaType="image/jpeg" representation="B64">e1xydGY...</text>
    <entry>
      <observationMedia classCode="OBS" moodCode="EVN" ID="CRC-embedded">
         <id root="2.16.840.1.113883.19.2.1"/>
         <value xsi:type="ED" mediaType="image/jpeg" reference=”B64”>
            <reference value="e1xydGY..."/>
         </value>
      </observationMedia>
    </entry>
</section>
```

Figure 6.3.4.1-1: Document Summary – Cardiac section example

6.3.4.2 Medical History - Cardiac Section 11329-0

[section: templateId 1.3.6.1.4.1.19376.1.4.1.2.17(open)]

([section: templateId 2.16.840.1.113883.10.20.22.2.39(open)] - parent)

The Medical History – Cardiac section content module describes all aspects of the medical history of the patient even if not pertinent to the current procedure, and may include chief complaint, past medical history, social history, family history, surgical or procedure history,

medication history, and other history information. The history may be limited to information pertinent to the current procedure or may be more comprehensive. The history may be reported as a collection of random clinical statements or it may be reported categorically. Entries for History of Past Illness and History of Present Illness have been consolidated into this section. Social and Family History are discussed in their own sections. For this Cath Report Content profile, this Medical History – Cardiac section content module may also contain history about specific relevant problems as problem observations.

In the event that the patient was transferred from another facility where there was a problem indication that the patient was determined to need a cath procedure, this will be noted as a problem observation in this medical history section as text in the narrative for now until there is a code representing this.

This Medical History – Cardiac section content module extends the Medical (General History Section (C-CDA 4.31). The additional constraints are listed below.

1. **SHALL** contain exactly one [1..1] **templateId** (CONF:8160) such that it
   a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.2.17" (CONF:10403-CRC).
2. **MAY** contain zero or more [0..*] **entry** (CONF:CRC-xxx) such that it
   a. **SHALL** contain exactly one [1..1] **Problem Observation - Cardiac** (templateId:1.3.6.1.4.1.19376.1.4.1.4.9) (CONF:CRC-xxx).
3. **MAY** contain zero or more [0..*] **entry** (CONF:CRC-xxx) such that it
   a. **SHALL** contain exactly one [1..1] **Procedure Activity Observation** (templateId:2.16.840.1.113883.10.20.22.4.13) (CONF:CRC-xxx).
4. **MAY** contain zero or more [0..*] **entry** (CONF:CRC-xxx) such that it
   a. **SHALL** contain exactly one [1..1] **Procedure Activity Procedure** (templateId:2.16.840.1.113883.10.20.22.4.14) (CONF:CRC-xxx).

```
<section>
  <templateId root="1.3.6.1.4.1.19376.1.4.1.2.17"/>
  <templateId root="2.16.840.1.113883.10.20.22.2.39"/>
  <code code="11329-0" codeSystem="2.16.840.1.113883.6.1"
        codeSystemName="LOINC"
        displayName="MEDICAL (GENERAL) HISTORY"/>
  <title>MEDICAL (GENERAL) HISTORY</title>
  <text>
    <list listType="ordered">
      <item>Patient has had a recent issue with chest pain that does
           not seem to be related to any particular cause.</item>
      <item>Previous concerns of heart disease were actually
related to other causes.</item>
      <item>Patient had recent weight gain due to sedentary lifestyle and
           new job.</item>
    </list>
  </text>
  <entry>
    <observation classCode=”OBS” moodCode=”EVN”>
      <templateId root=”1.3.6.1.4.1.19376.1.4.1.4.9”/>
      <!-- Problem Observation - Cardiac template -->
      <id root=”d11275e7-67ae-11db-bd13-0800200c9a66”/>
      <code code=”55607006” codeSystem=”2.16.840.1.113883.6.96”
            codeSystemName=”SNOMED CT”
            displayName=”Problem”/>
      <text>There was history of hypertension.</text>
      <statusCode code=”completed”/>
      <effectiveTime>
      </effectiveTime>
      <value xsi:type=”CD” code=”38341003”
            codeSystem=”1.2.840.10008.6.1.253” codeSystemName=”SNOMED CT”
            displayName=”Hypertension”/>
      <entryRelationship typeCode="SUBJ" inversionInd="true">
        <observation classCode="OBS" moodCode="EVN">
         <templateId root="2.16.840.1.113883.10.20.22.4.31"/>
         <!-- Age observation template -->
         <code code="445518008" codeSystem="2.16.840.1.113883.6.96"
               displayName="Age At Onset"/>
         <statusCode code="completed"/>
         <value xsi:type="PQ" value="57" unit="a"/>
        </observation>
      </entryRelationship>
      <entryRelationship typeCode="SUBJ" inversionInd="true">
        <observation classCode="OBS" moodCode="EVN">
         <templateId root="2.16.840.1.113883.10.20.22.4.6"/>
         <!—Problem status template -->
         <code code="33999-4" codeSystem="2.16.840.1.113883.6.1"
               displayName="Status"/>
         <statusCode code="completed"/>
         <value xsi:type="CD" code="55561003"
                     codeSystem="2.16.840.1.113883.6.96"
                     codeSystemName="SNOMED CT" displayName="Active”/>
        </observation>
      </entryRelationship>
```



```
      <entryRelationship typeCode="REFR" inversionInd="true">
        <observation classCode="OBS" moodCode="EVN">
         <templateId root="2.16.840.1.113883.10.20.22.4.5"/>
         <!-- Health status observation template -->
         <code code="11323-3"
               codeSystem="2.16.840.1.113883.6.1"
               codeSystemName="LOINC"
               displayName="Health status"/>
         <statusCode code="completed"/>
         <value xsi:type="CE" code="413322009"
               codeSystem="2.16.840.1.113883.6.96"
               codeSystemName="SNOMED CT"
               displayName="Resolved"/>
        </observation>
      </entryRelationship>
      <entryRelationship typeCode="REFR" inversionInd="true">
        <observation classCode="OBS" moodCode="EVN">
         <templateId root="2.16.840.1.113883.10.20.22.4.8"/>
         <!-- Severity observation template -->
         <code code="SEV" displayName="Severity Observation"
               codeSystem="2.16.840.1.113883.5.4"
               codeSystemName="ActCode"/>
         <text>
            <reference value="#severity"/>
         </text>
         <statusCode code="completed"/>
         <value xsi:type="CD" code="371924009" displayName="Moderate to severe"
                codeSystem="2.16.840.1.113883.6.96"
                codeSystemName="SNOMED CT"/>
        </observation>
      </entryRelationship>
    </observation>
  </entry>
  </entry>
    <procedure classCode="PROC" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.22.4.14"/>
      <!-- Procedure Activity Procedure template -->
      <id root="e401f340-7be2-11db-9fe1-0800200c9a66"/>
      <code code="500786010" codeSystem="1.3.6.1.4.1.19376.1.4.1.5.40"
            displayName="Left Heart Cath Procedure">
        <originalText>Left Heart Cath Procedure
            <reference value="procedure1"/></originalText>
      </code>
      <text>
        <reference value="procedure1"/>
      </text>
      <statusCode code="completed"/>
      <effectiveTime value="1998"/>
      <targetSiteCode code="41879009" codeSystem="2.16.840.1.113883.6.96"
             displayName="Distal RCA"/>
```



```
    </procedure>
  </entry>
  </entry>
    <observation classCode="OBS" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.22.4.13"/>
      <!-- Procedure Activity Observation template -->
      <id extension="proc1" root="2.16.840.1.113883.19"/>
      <code code="500786010" codeSystem="2.16.840.1.113883.6.96"
            displayName="Left Heart Cath Procedure" codeSystemName="SNOMED CT">
        <originalText>
           <reference value="#procedure1"/>
        </originalText>
      </code>
      <statusCode code="aborted"
                  codeSystem="2.16.840.1.113883.5.14"
                  codeSystemName="ActStatus"/>
      <effectiveTime value="20110203"/>
      <priorityCode code="CR" codeSystem="2.16.840.1.113883.5.7"
                    codeSystemName="ActPriority"
                    displayName="Callback results"/>
      <value xsi:type="CD" code="" codeSystem="2.16.840.1.113883.6.96"/>
      <methodCode nullFlavor="UNK"/>
      <targetSiteCode code="91083009" codeSystem="2.16.840.1.113883.6.96"
                  codeSystemName="SNOMED CT"
                  displayName=" Proximal Right Coronary Artery" />
      <performer>
        <assignedEntity>
          <id root="1.2.3.4" extension="1234"/>
          <addr>
            <streetAddressLine>17 Daws Rd.</streetAddressLine>
            <city>Blue Bell</city>
            <state>MA</state>
            <postalCode>02368</postalCode>
            <country>US</country>
          </addr>
          <telecom use="WP" value="1(555)555-1234"/>
          <representedOrganization>
            <id root="2.16.840.1.113883.19.5"/>
            <name>Good Health Clinic</name>
            <telecom nullFlavor="UNK"/>
            <addr nullFlavor="UNK"/>
          </representedOrganization>
        </assignedEntity>
      </performer>
    </observation>
  </entry>
</section>
```

Figure 6.3.4.2-1: Medical History – Cardiac section example

6.3.4.2.1 Problem Observation – Cardiac Constraints

`[Observation: templateId 1.3.6.1.4.1.19376.1.4.1.9(open)]`

This Problem Observation – Cardiac entry is used exactly as specified in the CRC Common Entry Content Modules - section 6.3.5.1, except for vocabulary constraints.

A Content Creator SHALL be able to include a Problem Observation – Cardiac Entry for each of the conditions identified in Value Set `1.3.6.1.4.1.19376.1.4.1.5.31` Cardiac Problems/Concerns. The value set for CONF:9058 (**`value`**) **SHOULD** be selected from ValueSet Cardiac Problems/Concerns Value Set `1.3.6.1.4.1.19376.1.4.1.5.31` **STATIC**.

A Content Creator SHALL be able to indicate the absence of the condition for the patient using the negation indicator.

A Content Creator SHALL be able to include a Problem Observation – Cardiac Entry with code {160245001, SNOMED CT, "No current problems or disability"}.

6.3.4.2.2 Procedure Activity Observation - Constraints

[`observation`: `templateId` `2.16.840.1.113883.10.20.22.4.13(open)`]

This entry is used exactly as specified in C-CDA - section 5.62, except for vocabulary constraints for targetSiteCode.

This entry is used to document the prior procedures for this patient that may be relevant to this cath procedure.

The value set for CONF:10121 (**`targetSiteCode`**) **SHOULD** be selected from ValueSet Body Site Value Set `1.3.6.1.4.1.19376.1.4.1.5.32` **STATIC**.

6.3.4.2.3 Procedure Activity Procedure - Constraints

[`procedure`: `templateId` `2.16.840.1.113883.10.20.22.4.14(open)`]

This entry is used exactly as specified in C-CDA - section 5.63, except for vocabulary constraints for code and targetSiteCode.

This entry is used to document the prior procedures for this patient that may be relevant to this cath procedure. Prior procedures can include but are not limited to Cath, PCI and CABG.

The value set for CONF:7657 (**`code`**) **SHOULD** be selected from ValueSet Cardiac Activity Procedures Value Set `1.3.6.1.4.1.19376.1.4.1.5.40` **STATIC**.

The value set for CONF:7683 (**`targetSiteCode`**) **SHOULD** be selected from ValueSet Body Site Value Set `1.3.6.1.4.1.19376.1.4.1.5.32` **STATIC**.

6.3.4.3 Allergies Section 48765-2

[section: templateId 2.16.840.1.113883.10.20.22.2.6(open)]

This Allergies section content module lists and describes any medication allergies, adverse reactions, idiosyncratic reactions, anaphylaxis/anaphylactoid reactions to food items, and metabolic variations or adverse reactions/allergies to other substances (such as latex, iodine, tape adhesives) used to assure the safety of health care delivery. At a minimum, it should list currently active and any relevant historical allergies and adverse reactions.

This Allergies section content module is used exactly as specified in C-CDA - section 4.2.

Within this Allergies section content module the Content Creator SHALL be able to create an Allergy – Intolerance Observation entry for each of the cardiac imaging agent classes identified in ValueSet Contrast Agents Classes for Adverse Reactions Value Set 1.3.6.1.4.1.19376.1.4.1.5.34.

```
<section>
    <templateId root="2.16.840.1.113883.10.20.22.2.6"/>
    <code code="48765-2"
          displayName="Allergies, adverse reactions, alerts"
          codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"/>
    <title>Allergies</title>
    <text>
      The patient has allergies to penicillin based products
    </text>
    <entry typeCode="DRIV">
      <act classCode="ACT" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.22.4.30"/>
        <!--   Allergy Problem Act template   -->
        ...
      </act>
    </entry>
</section>
```

Figure 6.3.4.3-1: Allergies section example

6.3.4.3.1 Allergy – Intolerance Observation - Constraints

[observation: templateId 2.16.840.1.113883.10.20.22.4.7(open)]

This Allergy – Intolerance Observation entry content module is used exactly as specified in C-CDA - section 5.4, except for vocabulary constraints on CONF:10083.

If the allergy is to Contrast Agents, the value set for CONF:10083 (**code**) **SHALL** be selected from ValueSet Contrast Agents Classes for Adverse Reactions Value Set 1.3.6.1.4.1.19376.1.4.1.5.34 **STATIC**.

6.3.4.4 Family History Section 10157-6

[section: templateId 2.16.840.1.113883.10.20.22.2.15 (open)]

This Family History section content module contains data defining the patient's genetic relatives in terms of possible or relevant health risk factors that have a potential impact on the patient's healthcare risk profile.

This Family History section content module is used exactly as specified in C-CDA - section 4.12.

If the relatedSubject of the Family History Organizer is a family member but the specific family member role is not known, the value "FAMMEMB" can be used to represent that the relatedSubject is a family member.

```
<section>
  <templateId root="2.16.840.1.113883.10.20.22.2.15"/>
  <!--  Family history section template  -->
  <code code="10157-6" codeSystem="2.16.840.1.113883.6.1"/>
  <title>Family history</title>
  <text> No Family History of Cardiovascular Disease</text>
  <entry typeCode=”DRIV”>
    <organizer classCode=”CLUSTER” moodCode=”EVN”>
      <templateId root=”2.16.840.1.113883.10.20.22.4.45”/>
      <statusCode code=”completed”/>
      <subject>
        <relatedSubject classCode=”PRS”>
          <code code=”FAMMEMB” codeSystem=”2.16.840.1.113883.5.111”>
            <translation code=”303071001” codeSystem=”2.16.840.1.113883.6.96”/>
          </code>
        </relatedSubject>
      </subject>
      <component>
        <observation classCode=”OBS” moodCode=”EVN”>
          <templateId root=”2.16.840.1.113883.10.20.22.4.46”/>
          <id root=”d11275e7-67ae-11db-bd13-0800200c9a66”/>
          <code code=”404684003” codeSystem=”2.16.840.1.113883.6.96”
                codeSystemName=”SNOMED CT” displayName=”Finding”/>
          <text>There was no family history of cardiovascular disease.</text>
          <statusCode code=”completed”/>
          <effectiveTime>
          </effectiveTime>
          <value xsi:type=”CD” code=”160270001”
              codeSystem=”2.16.840.1.113883.6.96” codeSystemName=”SNOMED CT”
              displayName=” No family history of cardiovascular disease”/>
        </observation>
      </component>
    </organizer>
  </entry>
</section>
```

Figure 6.3.4.4-1: Family History section example

6.3.4.4.1 Family History Observation - Constraints

[Observation: templateId 2.16.840.1.113883.10.20.22.4.46(open)]

The Family History Observation entry content module is used exactly as specified in C-CDA - section 5.25, except for vocabulary constraints on CONF:8591.

The value set for CONF:8591 (**code**) **SHOULD** be selected from ValueSet Cardiovascular Family History Value Set 1.3.6.1.4.1.19376.1.4.1.5.33 **STATIC**.

6.3.4.5 Social History Section 29762-2

[section: templateId 2.16.840.1.113883.10.20.22.2.17(open)]

The Social History section content module is used exactly as specified in C-CDA - section 4.57.

This Social History section content module contains data defining the patient's occupational, personal (e.g., lifestyle), social, and environmental history and health risk factors, as well as administrative data such as marital status, race, ethnicity and religious affiliation. Social history can have significant influence on a patient's physical, psychological and emotional health and wellbeing so should be considered in the development of a complete record.

Smoking status shall be documented using the Smoking Status Observation entry content module as specified in C-CDA section 5.75.


```
<section>
   <templateId root="2.16.840.1.113883.10.20.22.2.17"/>
   <!--  **  Social history section template   ** -->
   <code code="29762-2" codeSystem="2.16.840.1.113883.6.1"
      displayName="Social History"/>
   <title>Social History</title>
   <text>
      The patient was a former smoker.
   </text>
   <entry typeCode="DRIV">
      <observation classCode="OBS" moodCode="EVN">
         <templateId root="2.16.840.1.113883.10.20.22.4.78"/>
         <!--  **  Smoking status observation template   ** -->
         <id root="45efb604-7049-4a2e-ad33-d38556c9636c"/>
         <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>
         <statusCode code="completed"/>
         <effectiveTime>
            <low value="1973"/>
            <high value="2001"/>
         </effectiveTime>
         <value xsi:type="CD" code=”8517006”
                codeSystem=”2.16.840.1.113883.6.96”
                displayName=”Former Smoker”/>
      </observation>
   </entry>
</section>
```

Figure 6.3.4.5-1: Social History section example

6.3.4.5.1 Social History Observation - Constraints

[observation: templateId 2.16.840.1.113883.10.20.22.4.38(open)]

The Social History Observation entry content module is used exactly as specified in C-CDA - section 5.76.

To include cocaine misuse behavior, the value allowed for CONF:8559 (**value**) **SHOULD** be “78267003” from SNOMED CT “Cocaine abuse”.

6.3.4.6 Physical Exam Section 29545-1

[section: templateId 2.16.840.1.113883.10.20.2.10(open)]

The Physical Exam section content module is used exactly as specified in C-CDA - section 4.38.

The Physical Exam section content module includes direct observations made by the clinician. The examination may include the use of simple instruments and may also describe simple maneuvers performed directly on the patient’s body. This Physical Exam section includes only observations made by the examining clinician using inspection, palpation, auscultation, and percussion; it does not include laboratory or imaging findings. The exam may be limited to pertinent body systems based on the patient’s chief complaint or it may include a comprehensive

examination. The examination may be reported as a collection of random clinical statements or it may be reported categorically.

```
<section>
    <templateId root="2.16.840.1.113883.10.20.2.10"/>
    <code codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
        code="29545-1" displayName="PHYSICAL FINDINGS"/>
    <title>PHYSICAL EXAMINATION</title>
    <text>
      <paragraph>All normal to examination.</paragraph>
    </text>
</section>
```

Figure 6.3.4.6-1: Physical Exam section example

6.3.4.7 Vital Signs Section 8716-3

[section: templateId 2.16.840.1.113883.10.20.22.2.4(open)]

The Vital Signs Section content module is used exactly as specified in C-CDA - section 4.60.

The Vital Signs section content module is intended to include vital sign measurements taken at admission and at the time of procedure, if feasible.


```
<section>
  <templateId root="2.16.840.1.113883.10.20.22.2.4"/>
  <code code="8716-3"
        codeSystem="2.16.840.1.113883.6.1"
        codeSystemName="LOINC"
        displayName="VITAL SIGNS" />
  <title>Vital Signs</title>
  <text>These are the vital signs related to the procedure </text>
  <entry typeCode="DRIV">
    <organizer classCode="CLUSTER" moodCode="EVN">
      <templateId root="2.16.840.1.113883.10.20.22.4.26"/>
      <!-- Vital signs organizer template -->
      <id root="c6f88320-67ad-11db-bd13-0800200c9a66"/>
      <code code="46680005" codeSystem="2.16.840.1.113883.6.96"
            codeSystemName="SNOMED CT" displayName="Vital signs"/>
      <statusCode code="completed"/>
      <effectiveTime value="19991114"/>
      <component>
        <observation classCode="OBS" moodCode="EVN">
          <templateId root="2.16.840.1.113883.10.20.22.4.27"/>
          <!-- Vital sign observation for height -->
          <id root="c6f88321-67ad-11db-bd13-0800200c9a66"/>
          <code code="8302-2"
                codeSystem="2.16.840.1.113883.6.1"
                codeSystemName="LOINC"
                displayName="Height"/>
          <text><reference value="#height1"/></text>
          <statusCode code="completed"/>
          <effectiveTime value="19991114"/>
          <value xsi:type="PQ" value="177" unit="cm"/>
          <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"/>
        </observation>
      </component>
    </organizer>
  </entry>
</section>
```

Figure 6.3.4.7-1: Vital Signs section example

6.3.4.7.1 Vital Sign Observation - Constraints

[observation: templateId 2.16.840.1.113883.10.20.22.4.27(open)]

The Vital Sign Observation entry content module is used exactly as specified in C-CDA - section 5.81, except for vocabulary constraints.

The value set for CONF:7301 (**code**) **SHOULD** be selected from ValueSet Vital Sign Result Value Set 1.3.6.1.4.1.19376.1.4.1.5.36 **STATIC**.

6.3.4.8 Pre-Procedure Results – Cardiac Section 30954-2

[section: templateId 1.3.6.1.4.1.19376.1.4.1.2.23 (open)]

([section: templateId 2.16.840.1.113883.10.20.22.2.3(open)] – parent)

This Pre-Procedure Results – Cardiac Section content module is based on the C-CDA Results Section content module as specified in C-CDA - section 4.55.

The Pre-Procedure Results – Cardiac section content module contains the results of pre-procedure tests that are required to prepare for the cath procedure. Results from prior diagnostic cath procedures are included here if they provide indications for the current interventional procedure. There may also be a reference to an optional external document in the result organizer.

This Pre-Procedure Results – Cardiac section content module contains the results of observations generated by laboratories, imaging procedures, and other procedures. The scope includes observations such as hematology, chemistry, serology, virology, toxicology, microbiology, plain x-ray, ultrasound, CT, MRI, angiography, echocardiography, nuclear medicine, pathology, and procedure observations. The section often includes notable results such as abnormal values or relevant trends, and could contain all results for the period of time being documented.

Imaging results are typically generated by a clinician reviewing the output of an imaging procedure, such as where a cardiologist reports the left ventricular ejection fraction based on the review of a cardiac echocardiogram.

This Pre-Procedure Results – Cardiac section content module modifies the Results Section (C-CDA 4.55). The complete set of constraints for the Pre-Procedure Results – Cardiac section content module are defined below. The substitutions are highlighted in yellow. This Pre-Procedure Results – Cardiac section content module is also conformant to the C-CDA Results Section content module.

1. **SHALL** contain two or more [2..*] **templateId** (CONF:7116-CRC) such that it
    a. **SHALL** contain exactly one [1..1] **@root**="2.16.840.1.113883.10.20.22.2.3" (CONF:9136).
    b. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.2.23" (CONF:CRC-xxx).
2. **SHALL** contain exactly one [1..1] **code** (CONF:15431).
    a. This code **SHALL** contain exactly one [1..1] **@code**="30954-2" Relevant diagnostic tests and/or laboratory data (CodeSystem: LOINC 2.16.840.1.113883.6.1) (CONF:15432).
3. **SHALL** contain exactly one [1..1] **title** (CONF:8891).
4. **SHALL** contain exactly one [1..1] **text** (CONF:7118).
5. **SHALL** contain at least one [1..*] **entry** (CONF:7119) such that it
    a. **SHALL** contain exactly one [1..1] **Result Organizer - Cardiac** (templateId:1.3.6.1.4.1.19376.1.4.1.4.11) (CONF:15515-CRC).

```
<section>
    <templateId root="1.3.6.1.4.1.19376.1.4.1.2.23"/>
    <templateId root="2.16.840.1.113883.10.20.22.2.3"/>
    <code code="30954-2"
          codeSystem="2.16.840.1.113883.6.1"
          codeSystemName="LOINC"
          displayName="RESULTS" />
    <title>Results</title>
    <text>
       ...
    </text>
    <entry typeCode="DRIV">
      <organizer classCode="CLUSTER" moodCode="EVN">
        <templateId root="1.3.6.1.4.1.19376.1.4.1.4.11"/>
        <id root="7d5a02b0-67a4-11db-bd13-0800200c9a66"/>
        <code code="57021-8" displayName="CBC W Auto Differential panel"
              codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"/>
        <statusCode code="completed"/>
        <component>
          <observation classCode="OBS" moodCode="EVN">
            <!-- Result observation template -->
            <templateId root="2.16.840.1.113883.10.20.22.4.2"/>
            <id root="107c2dc0-67a5-11db-bd13-0800200c9a66"/>
            <code code="30313-1" displayName="HGB"
                  codeSystem="2.16.840.1.113883.6.1"
                  codeSystemName="LOINC"/>
            <statusCode code="completed"/>
            <effectiveTime value="200003231430"/>
            <value xsi:type="PQ" value="13.2" unit="g/dl"/>
            <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"/>
            <methodCode/>
            <targetSiteCode/>
            <referenceRange>
              <observationRange>
                <text>M 13-18 g/dl; F 12-16 g/dl</text>
              </observationRange>
            </referenceRange>
          </observation>
        </component>
        <reference typeCode="REFR">
          <externalDocument>
             <id root="b50b7910-7ffb-4f4c-bbe4-177ed68cbbf3"/>
             <text mediaType="application/pdf">
                <reference
                    value="PreProcedureResults.pdf"/>
             </text>
          </externalDocument>
        </reference>
      </organizer>
    </entry>
</section>
```

Figure 6.3.4.8-1: Pre-Procedure Results section example

6.3.4.8.1 Result Organizer - Cardiac

[organizer: templateId 1.3.6.1.4.1.19376.1.4.1.4.11 (open)]

([organizer: templateId 2.16.840.1.113883.10.20.22.4.1(open)] – parent)

This clinical statement identifies a set of result observations. It contains information applicable to all of the contained result observations. Result type codes categorize a result into one of several commonly accepted values (e.g., "Diagnostic Cath", "PCI", "Diagnostic Cath and PCI"). These values are often implicit in the Result Organizer code (e.g., an Organizer/code of "complete blood count" implies a Result Observation code of "Hematology").

An appropriate nullFlavor can be used when a single result observation is contained in the organizer, and organizer/code or organizer/id is unknown.

There may also be a reference to an optional external document in the result organizer.

This Result Organizer – Cardiac entry content module extends the C-CDA Result Organizer entry definition (C-CDA 5.71) by adding the constraints listed below.

1. **SHALL** contain exactly one [1..1] **templateId** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.4.11" (CONF:CRC-xxx).
2. **MAY** contain zero or more [0..*] **reference** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="REFR" Refers to (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:CRC-xxx).
    b. **SHALL** contain exactly one [1..1] **externalDocument** (CONF:CRC-xxx).
        i. This externalDocument **SHALL** contain at least one [1..*] **id** (CONF:CRC-xxx).
        ii. This externalDocument **MAY** contain zero or one [0..1] **text** (CONF:CRC-xxx).
            1. The text, if present, **MAY** contain zero or one [0..1] **@mediaType** (CONF:CRC-xxx).
            2. The text, if present, **MAY** contain zero or one [0..1] **reference** (CONF:CRC-xxx).
                a. The URL of a referenced pre-procedure results document **MAY** be present, and **SHALL** be represented in organizer/reference/ExternalDocument/text/reference (CONF:CRC-xxx).
                b. If a URL is referenced, then it **SHOULD** have a corresponding linkHTML element in narrative block (CONF:CRC-xxx).

6.3.4.8.2 Result Observation - Constraints

[observation: templateId 2.16.840.1.113883.10.20.22.4.2(open)]

This clinical statement represents details of a lab, radiology, or other study performed on a patient.

This Result Observation entry is used exactly as specified in C-CDA - section 5.70 except for vocabulary constraints for the code and value elements. The constraints on the code and value elements are defined in the Results Observations Constraints Set 1.3.6.1.4.1.19376.1.4.1.5.38 **STATIC**.

The value set for CONF:19211 (**code**) **SHOULD** be selected from LOINC (CodeSystem: 2.16.840.1.113883.6.1) or SNOMED CT using the codes specified in the Result Observations Constraints Set 1.3.6.1.4.1.19376.1.4.1.5.38 **STATIC**.

The value set for CONF:19212 (**code**) **SHOULD** be selected from ValueSet Cardiac Lab Results Value Set 1.3.6.1.4.1.19376.1.4.1.5.35 **STATIC**.

The value set for CONF:7153 (**targetSiteCode**) **SHOULD** be selected from ValueSet Body Site Value Set 1.3.6.1.4.1.19376.1.4.1.5.32 **STATIC**.

6.3.4.9 Planned Procedure Section 59772-4

[section: templateId 2.16.840.1.113883.10.20.22.2.30(open)]

The Planned Procedure section content module is used exactly as specified in C-CDA - section 4.40.

The Planned Procedure section content module records the procedure(s) that a physician or clinician thought would need to be done based on the preoperative assessment. Procedures include but are not limited to Diagnostic Cath, Angiography, and PCI. It may be important to record the procedure(s) that were originally planned for, consented to, and perhaps pre-approved by the payor, particularly if different from the actual procedure(s) and procedure details, to provide evidence to various stakeholders that the providers are aware of the discrepancy and the justification can be found in the procedure details.

The specific procedures in the Plan of Care Activity Procedure entry content module **SHOULD** be selected from ValueSet Cardiac Activity Procedures Value Set 1.3.6.1.4.1.19376.1.4.1.5.40 **STATIC**.


```
<section>
   <templateId root="2.16.840.1.113883.10.20.22.2.30"/>
   <!--  ******** Planned Procedure Section template  ******** -->
   <code code="59772-4" codeSystem="2.16.840.1.113883.6.1"
      codeSystemName="LOINC" displayName="Planned Procedure"/>
   <title>Planned Procedure</title>
   <text>
      A diagnostic catheterization is planned.
   </text>
   <entry>
      <procedure moodCode="RQO" classCode="PROC">
         <templateId root="2.16.840.1.113883.10.20.22.4.41"/>
         <!-- ** Plan of Care Activity Procedure Template ** -->
         <id root="9a6d1bac-17d3-4195-89c4-1121bc809b5a"/>
         <code code="41976001" codeSystem="2.16.840.1.113883.6.96"
               displayName="Diagnostic Catheterization"/>
         <statusCode code="new"/>
         <effectiveTime>
             <center value="20000421"/>
         </effectiveTime>
      </procedure>
   </entry>
</section>
```

Figure 6.3.4.9-1: Planned Procedure section example

6.3.4.10 Procedure Indications Section 59768-2

[section: templateId 2.16.840.1.113883.10.20.22.2.29(open)]

The Procedure Indications section content module is used exactly as specified in C-CDA - section 4.50.

The Procedure Indications section content module records details about the reason for this Cath/PCI procedure. This Procedure Indications section content module may include the pre-procedure diagnosis or diagnoses as well as one or more symptoms that contribute to the reason the procedure is being performed.


```
<section>
   <templateId root="2.16.840.1.113883.10.20.22.2.29"/>
   <code code="59768-2" codeSystem="2.16.840.1.113883.6.1"
      codeSystemName="LOINC" displayName="PROCEDURE INDICATIONS"/>
   <title>Procedure Indications</title>
   <text>The procedure is performed for screening in a low risk individual.
   </text>
   <entry>
      <observation classCode="OBS" moodCode="EVN">
         <!-- Indication Entry -->
         <templateId root="2.16.840.1.113883.10.20.22.4.19"/>
         <code code="409586006"
               codeSystem="2.16.840.1.113883.6.96"
               codeSystemName="SNOMED CT" displayName="Complaint"/>
         <statusCode code="completed"/>
         <value xsi:type="CD"
                code="29857009" codeSystem="2.16.840.1.113883.6.96"
                codeSystemName="SNOMED CT" displayName="Chest pain"/>
      </observation>
   </entry>
</section>
```

Figure 6.3.4.10-1: Procedure Indications section example

6.3.4.10.1 Indication - Constraints

[observation: templateId 2.16.840.1.113883.10.20.22.4.19(open)]

This Indication entry content module is used exactly as specified in C-CDA - section 5.37 except for vocabulary constraints.

The Indication entry content module documents the rationale for an activity. It can do this with the id element to reference a problem recorded elsewhere in the document or with a code and value to record the problem type and problem within the Indication. For example, the indication for Diagnostic Catheterization might be chest pain.

The value set for CONF:15985 (**value**) **SHOULD** be selected from ValueSet Procedure Indications Value Set 1.3.6.1.4.1.19376.1.4.1.5.37 **STATIC**.

6.3.4.11 Anesthesia Section 59774-0

[section: templateId 2.16.840.1.113883.10.20.22.2.25(open)]

The Anesthesia section content module is used exactly as specified in C-CDA - section 4.3.

The Anesthesia section content module briefly describes the general anesthesia used and may state the actual agent used. The Procedure Activity Procedure entry content module describes the anesthesia procedure. The Medication Activity entry content module may describe the general anesthesia medication used during this cath procedure.


```
<section>
    <templateId root="2.16.840.1.113883.10.20.22.2.25"/>
    <code code="59774-0"
          codeSystem="2.16.840.1.113883.6.1"
          codeSystemName="LOINC"
          displayName="PROCEDURE ANESTHESIA"/>
    <title>Procedure Anesthesia</title>
    <text> Conscious sedation with propofol 200 mg IV </text>
    <entry>
      <procedure classCode="PROC" moodCode="EVN">
        <!-- Procedure activity procedure template -->
        <templateId root="2.16.840.1.113883.10.20.22.4.14"/>
        <id root="e401f340-7be2-11db-9fe1-0800200c9a66"/>
        <code code="415070008" codeSystem="2.16.840.1.113883.6.96"
              displayName="PCI">
           <originalText> PCI <reference value="procedure1"/></originalText>
        </code>
        <text>
          <reference value="procedure1"/>
        </text>
        <statusCode code="completed"/>
        <effectiveTime value="201109261015"/>
        <targetSiteCode code="41879009"
                  codeSystem="2.16.840.1.113883.6.96"
                  displayName="Distal RCA"/>
        <participant typeCode="DEV">
          <participantRole classCode="MANU">
            <!-- Product instance template -->
            <templateId root="2.16.840.1.113883.10.20.22.4.37"/>
             ...
          </participantRole>
        </participant>
        <entryRelationship typeCode="COMP" inversionInd="true">
          <substanceAdministration classCode="SBADM" moodCode="INT">
            <!-- Medication activity template -->
            <templateId root=" 2.16.840.1.113883.10.20.22.4.16"/>
            ...
          </substanceAdministration>
        </entryRelationship>
      </procedure>
    </entry>
    <entry>
      <substanceAdministration classCode="SBADM" moodCode="EVN">
        <!-- Medication activity template -->
        <templateId root="2.16.840.1.113883.10.20.22.4.16"/>
        ...
      </subtanceAdministration>
    </entry>
</section>
```

Figure 6.3.4.11-1: Anesthesia section example

6.3.4.11.1 Procedure Activity Procedure - Constraints

[procedure: templateId 2.16.840.1.113883.10.20.22.4.14(open)]

The Procedure Activity Procedure entry content module is used exactly as specified in C-CDA - section 5.63, except for vocabulary constraints.

The Procedure Activity Procedure entry content module describes the anesthesia procedure.

The value set for CONF:19207 (**code**) **SHOULD** be selected from ValueSet Cardiac Activity Procedures Value Set 1.3.6.1.4.1.19376.1.4.1.5.40 **STATIC**.

The value set for CONF:16082 (**targetSiteCode**) **SHOULD** be selected from ValueSet Body Site Value Set 1.3.6.1.4.1.19376.1.4.1.5.32 **STATIC**.

6.3.4.12 Medications Administered Section 29549-3

[section: templateId 2.16.840.1.113883.10.20.22.2.38(open)]

This Medications Administered section content module is used exactly as specified in C-CDA - section 4.32 except for vocabulary constraints.

The Medications Administered section content module defines medications and fluids administered during the procedure, encounter, or other activity excluding general anesthetic medications.

A Content Creator **SHALL** be able to create a Medications Activity entry with a Medication Information Entry for each of the cardiac medication classes identified in ValueSet Drug Classes and Specific Cardiac Drugs Used in Cardiac Procedures Value Set 1.3.6.1.4.1.19376.1.4.1.5.41 **STATIC**.

A Content Creator **SHALL** be able to create a Medications Activity entry with a Medication Information entry for the relevant cardiac contrast agents identified in ValueSet Contrast Agents Value Set 1.3.6.1.4.1.19376.1.4.1.5.39 **STATIC**.

The set of contrast agents implemented may be limited to a subset of the Value Set, based on the types of procedures for which the Content Creator creates reports, hence the term "*relevant* cardiac contrast agents".


```
<section>
    <templateId root="2.16.840.1.113883.10.20.22.2.38" />
    <code code="29549-3"
          codeSystem="2.16.840.1.113883.6.1"
          codeSystemName="LOINC"
          displayName="MEDICATIONS ADMINISTERED" />
    <title>Medications Administered</title>
    <text>Aspirin, other antiplatelet agents</text>
    <entry>
      <substanceAdministration classCode="SBADM" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.22.4.16"/>
        <!-- Medication Activity template -->
        <id root="cdbd33f0-6cde-11db-9fe1-0800200c9a66"/>
        <text>
          <reference value="#med1”/>
          Aspirin, other antiplatelet agents
        </text>
        <statusCode code="completed"/>
        <effectiveTime xsi:type="IVL_TS">
          <low value="20110926"/>
          <high value="20111014"/>
        </effectiveTime>
        <effectiveTime xsi:type="PIVL_TS" institutionSpecified="true"
            operator="A">
          <period value="6" unit="h"/>
        </effectiveTime>
        <doseQuantity value="1"/>
        <consumable>
          <manufacturedProduct classCode="MANU">>
            <templateId root="2.16.840.1.113883.10.20.22.4.23"/>
            <!-- Medication Information template -->
            <id/>
            <manufacturedMaterial>
              <code code="7947003"
                    codeSystem="2.16.840.1.113883.6.96"
                    displayName="Aspirin"/>
            </manufacturedMaterial>
            <manufacturerOrganization>...</manufacturerOrganization>
          </manufacturedProduct>
        </consumable>
        <performer>
        </performer>
      </substanceAdministration>
    </entry>
</section>
```

Figure 6.3.4.12-1: Medications administered section example

6.3.4.12.1 Medication Information - Constraints

[`manufacturedProduct`: `templateId` `2.16.840.1.113883.10.20.22.4.23(open)`]

This Medication Information entry is used exactly as specified in C-CDA - section 5.41 except for vocabulary constraints.

The value set for CONF:7412 (**manufacturedMaterial/code@code**) **SHOULD** be selected from ValueSet Medication Clinical Drug Value Set 1.3.6.1.4.1.19376.1.4.1.5.41 **STATIC** or **SHOULD** be selected from ValueSet Contrast Agents Value Set 1.3.6.1.4.1.19376.1.4.1.5.39 **STATIC**.

6.3.4.13 Procedure Description – Cardiac Section 29554-3

[section: templateId 1.3.6.1.4.1.19376.1.4.1.2.19(open)]

([section: templateId 2.16.840.1.113883.10.20.22.2.27(open)] – parent)

The Procedure Description – Cardiac section content module records the details of the cardiac procedures and may include procedure site preparation, surgical site preparation, pertinent details related to sedation/anesthesia, pertinent details related to measurements and markings, procedure times, medications administered, estimated blood loss, specimens removed, instrumentation, sponge counts, tissue manipulation, wound closure, sutures used, vital signs and other monitoring data. Local practice often identifies the level and type of detail required based on the procedure or specialty.

This Procedure Description – Cardiac section content module may include a device organizer to record information about each device used during the procedures. All devices should be defined at this section level within a Procedure Device Organizer – Cardiac entry. Additional characteristics inherent to these devices, like length and diameter, should be defined using an additional Procedure Device Organizer – Cardiac entry within this section. In addition, dynamic attributes of these devices, like balloon inflation atmospheres, should be recorded in the Procedure Activity Procedure – Cardiac entry within this section content module.

For PCI procedures, individual lesions will be defined in this section as separate lesion observations identified by a unique "lesion ID". Only the location of the lesion will be identified here. Procedures, procedure findings, and results can then reference to the lesion to which it is related by creating an entryRelationship of type="REFR" to the lesion observation based on the "lesion ID" within the Procedure Activity Procedure – Cardiac entry.

This Procedure Description – Cardiac section content module extends the C-CDA Procedure Description section (C-CDA 4.45) by adding the constraints listed below.

1. **SHALL** contain exactly one [1..1] **templateId** (CONF:CRC-xxx) such that it
   a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.2.19" (CONF:CRC-xxx).
2. **MAY** contain zero or more [0..*] **entry** (CONF:CRC-xxx) such that it
   a. **SHALL** contain exactly one [1..1] **Procedure Device Organizer - Cardiac**(templateId:1.3.6.1.4.1.19376.1.4.1.4.12) (CONF:CRC-xxx).
3. **MAY** contain zero or more [0..*] **entry** (CONF:CRC-xxx) such that it
   a. **SHALL** contain exactly one [1..1] **Lesion Observation** (templateId:1.3.6.1.4.1.19376.1.4.1.4.10) (CONF:CRC-xxx). These identify the lesions including where they are located.

4. **SHALL** contain at least one [1..*] **entry** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **Procedure Activity Procedure - Cardiac** (templateId:1.3.6.1.4.1.19376.1.4.1.4.14) (CONF:CRC-xxx).

```
<section>
    <templateId root="1.3.6.1.4.1.19376.1.4.1.2.19"/>
    <templateId root="2.16.840.1.113883.10.20.22.2.27"/>
    <!-- Procedure Description – Cardiac section template -->
    <code code="29554-3"
          codeSystem="2.16.840.1.113883.6.1"
          codeSystemName="LOINC"
          displayName="PROCEDURE DESCRIPTION" />
    <title>Procedures</title>
    <text>
      This is the narrative for this section...
    </text>
    <entry>
    <!-- Procedure Device Organizer for device inventory – this could include
the guide wire, the balloon and the stent… -->
       <organizer classCode="CLUSTER" moodCode="EVN">
          <templateId root=”1.3.6.1.4.1.19376.1.4.1.4.12”/>
          <participant typecode=”SUBJ”>
             <participantRole classCode=”MANU”>
                  <id root=” eb936010-7b17-11db-9fe1-0800200c9b66”>
                  <playingDevice>    <!-- guidewire -->
                     <code code=”272224001” codeSystem="2.16.840.1.113883.6.96"
                           displayName="guide wire”/>
                  </playingDevice>
                  <scopingEntity>
                     <id root="eb936010-7b17-11db-9fe1-0800200c9b65"/>
                  </scopingEntity>
             </paricipantRole>
          </participant>
       </organizer>
    </entry>
    <entry>
    <!-- Organizer for specific device with observations (e.g.,
size/dimensions) -->
       <organizer classCode="CLUSTER" moodCode="EVN">
       <!-- Procedure Device Organizer template -->
          <templateId root=”1.3.6.1.4.1.19376.1.4.1.4.12”/>
          <participant typecode=”SUBJ”>
             <participantRole classCode=”MANU”>
                  <id root=” eb936010-7b17-11db-9fe1-0800200c9b68”>
                  <playingDevice>    <!-- stent -->
                     <code code=”3831886012”
                           codeSystem="2.16.840.1.113883.6.96"
                           displayName="JJ-stent”/>
                  </playingDevice>
                  <scopingEntity>
                     <id root="eb936010-7b17-11db-9fe1-0800200c9b65"/>
                  </scopingEntity>
             </paricipantRole>
          </participant>
          <component>
             <observation classCode="SUBJ" moodCode="EVN">
             <!-- Device Observation template -->
                <templateId root=”1.3.6.1.4.1.19376.1.4.1.4.13”/>
```



```
                <id root=" eb936010-7b17-11db-9fe1-0800200c9b6a">
                <code code="408706001" displayName="vascular stent diameter"
                      codeSystem="2.16.840.1.113883.6.96"
                      codeSystemName="SNOMED CT"/>
                <statusCode code="completed"/>
                <effectiveTime value="201109261015"/>
                <value xsi:type="PQ" value="13.2" unit="mm"/>
             </observation>
          </component>
          <component>
             <observation classCode="SUBJ" moodCode="EVN">>
             <!-- Device Observation template -->
                <templateId root="1.3.6.1.4.1.19376.1.4.1.4.13"/>
                <id root=" eb936010-7b17-11db-9fe1-0800200c9b6a">
                <code code="408703009" displayName="vascular stent length"
                      codeSystem="2.16.840.1.113883.6.96"
                      codeSystemName="SNOMED CT"/>
                <statusCode code="completed"/>
                <effectiveTime value="201109261015"/>
                <value xsi:type="PQ" value="11.8" unit="mm"/>
             </observation>
          </component>
       </organizer>
    </entry>

<!-- define lesions by indicating the targetSiteCodes where located -->
    <entry>
      <observation classCode="OBS" moodCode="EVN">
      <!-- Lesion Observation template -->
        <templateID root="1.3.6.1.4.1.19376.1.4.1.4.10" />
        <id root="2.840.110893.98120.74.8" ext="lesion #1" />
        <code code="404684003"
          codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"
          displayName="Finding" />
        <targetSiteCode code="56322004"
          codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"
          displayName="Left PDA">
          <qualifier>
            <value code="40415009"
                   codeSystem="2.16.840.1.113883.6.96"
                   codeSystemName="SNOMED CT" displayName="proximal" />
          </qualifier>
        </targetSiteCode>
        <targetSiteCode code="56322004"
          codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"
          displayName="Left PDA">
          <qualifier>
            <value code="255562008"
                  codeSystem="2.16.840.1.113883.6.96"
                  codeSystemName="SNOMED CT" displayName="mid" />
          </qualifier>
        </targetSiteCode>
      </observation>
    </entry>
```



```
    <entry typeCode="DRIV">
      <procedure classCode="PROC" moodCode="EVN">
        <!-- Procedure Activity Procedure – Cardiac template -->
        <templateId root="1.3.6.1.4.1.19376.1.4.1.4.14"/>
        <templateId root="2.16.840.1.113883.10.20.22.4.14"/>
        <id root="CPAC1"/>
        <code code="415070008" codeSystem="2.16.840.1.113883.6.96"
              displayName="PCI>
          <originalText>PCI<reference value="procedure1"/></originalText>
        </code>
        <text>
          <reference value="procedure1"/>
        </text>
        <statusCode code="completed"/>
        <effectiveTime value="201109261015"/>
        <targetSiteCode code="41879009" codeSystem="2.16.840.1.113883.6.96"
                        displayName="Left PDA”/>
        <participant typeCode="PRD">
          <participantRole classCode="MANU">
            <!-- Product instance template -->
            <templateId root="2.16.840.1.113883.10.20.22.4.37"/>
            <playingDevice>
               <id root="P123">
               <code code="102319006" codeSystem="2.16.840.1.113883.6.96"
                     displayName=”Percutaneous transluminal angioplasty
                                  balloon, device (physical object)"/>
            </playingDevice>
            <scopingEntity>
               <id root="eb936010-7b17-11db-9fe1-0800200c9b65"/>
            </scopingEntity>
          </participantRole>
        </participant>
        <participant typeCode="PRD">
          <participantRole classCode="MANU">
            <!-- Product instance template -->
            <templateId root="2.16.840.1.113883.10.20.22.4.37"/>
            <id root="G456">
            <playingDevice>
               <code code="272224001" codeSystem="2.16.840.1.113883.6.96"
                     displayName=”guide wire"/>
            </playingDevice>
            <scopingEntity>
               <id root="eb936010-7b17-11db-9fe1-0800200c9b65"/>
            </scopingEntity>
          </participantRole>
        </participant>
        <entryRelationship typeCode=”REFR”>
           <organizer classCode="CLUSTER" moodCode="EVN">
             <participant typeCode="PRD">
               <participantRole classCode="MANU">
                 <id root="p123">
                 <playingDevice>
                    <code code="102319006"
                          codeSystem="2.16.840.1.113883.6.96"
```



```
                            displayName=" Percutaneous transluminal angioplasty
                                    balloon, device (physical object)"/>
                  </playingDevice>
                  <scopingEntity>
                    <id root="eb936010-7b17-11db-9fe1-0800200c9b65"/>
                  </scopingEntity>
                </participantRole>
              </participant>
              <component>
                <observation classCode="OBS" moodCode="EVN">
                  <!-- Device observation template -->
                  <templateId root="1.3.6.1.4.1.19376.1.4.1.4.13"/>
                  <id root=" eb936010-7b17-11db-9fe1-0800200c9b6b"/>
                  <code code=”371851006” displayName="angioplasty inflation
pressure"
                    codeSystem="2.16.840.1.113883.6.96"
                    codeSystemName="SNOMED CT"/>
                  <statusCode code="completed"/>
                  <effectiveTime value="201109261015"/>
                  <value xsi:type="PQ" value="13.2" unit="[ATM]"/>
                </observation>
              </component>
              <component>
                <observation classCode="OBS" moodCode="EVN">
                  <!-- Device observation template -->
                  <templateId root="1.3.6.1.4.1.19376.1.4.1.4.13"/>
                  <id root=" eb936010-7b17-11db-9fe1-0800200c9b6c"/>
                  <code code=”371852004”
                        displayName="angioplasty inflation duration"
                        codeSystem="2.16.840.1.113883.6.96"
                        codeSystemName="SNOMED CT"/>
                  <statusCode code="completed"/>
                  <effectiveTime value="201109261015"/>
                  <value xsi:type="PQ" value="11.6" unit="s"/>
                </observation>
              </component>
            </organizer>
          </entryRelationship>

<!-- link to the lesion for this procedure which was defined previously in this
section -->
          <entryRelationship typeCode=”REFR”>
             <observation classCode=”OBS” moodCode=”EVN”>
               <templateID root="1.3.6.1.4.1.19376.1.4.1.10" />
               <id root="2.840.110893.98120.74.8" ext=”lesion #1” />
               <code code="404684003"
                     codeSystem="2.16.840.1.113883.6.96"
                     codeSystemName="SNOMED CT" displayName="Finding" />
             </observation>
          </entryRelationship>
        </procedure>
      </entry>
</section>
```


Figure 6.3.4.13-1: Procedure Description - Cardiac section example

6.3.4.13.1 Procedure Activity Procedure - Cardiac

[procedure: templateId 1.3.6.1.4.1.19376.1.4.1.4.14 (open)]

([procedure: templateId 2.16.840.1.113883.10.20.22.4.14(open)] – parent)

This clinical statement represents procedures whose immediate and primary outcome (post-condition) is the alteration of the physical condition of the patient. Examples of these procedures are a diagnostic cardiac catheterization and PCI.

This Procedure Activity Procedure – Cardiac entry content module may also include a device organizer to record specific properties of the devices as observed during the procedure. Dynamic attributes of these devices, like balloon inflation atmospheres, should be recorded in this Procedure Activity Procedure – Cardiac entry.

Within this Procedure Activity Procedure – Cardiac entry content module, Product Instances are used to document the devices used. Record as many devices as needed unless the cath lab procedure is aborted. In this case, there may be no devices used.

Developers using this CRC content profile will map specific equipment using appropriate inventory numbering and product descriptions provided by the hemodynamic monitoring system or equivalents. If this CRC content profile is to be consumed and used in a CVIS, it is up to the developer to map the actual codes to the appropriate ACC NCDR-Cath/PCI codes.

This Procedure Activity Procedure – Cardiac entry content module is used exactly as specified in C-CDA - section 5.63 except for the modifications to the constraints highlighted in yellow below. This Procedure Activity Procedure – Cardiac entry content module is also conformant to the C-CDA Procedure Activity Procedure entry content module.

1. **SHALL** contain exactly one [1..1] **@classCode**="PROC" Procedure (CodeSystem: HL7ActClass 2.16.840.1.113883.5.6) (CONF:7652).
2. **SHALL** contain exactly one [1..1] **@moodCode**, which **SHALL** be selected from ValueSet MoodCodeEvnInt 2.16.840.1.113883.11.20.9.18 **STATIC** 2011-04-03 (CONF:7653).
3. **SHALL** contain two or more [2..*] **templateId** (CONF:7654-CRC) such that
   a. **SHALL** contain exactly one [1..1] **@root**="2.16.840.1.113883.10.20.22.4.14" (CONF:10521).
   b. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.4.14" (CONF:CRC-xxx).
4. **SHALL** contain at least one [1..*] **id** (CONF:7655).
5. **SHALL** contain exactly one [1..1] **code** (CONF:7656).
   a. This code in a procedure activity **SHOULD** be selected from LOINC (codeSystem 2.16.840.1.113883.6.1) or SNOMED CT (CodeSystem: 2.16.840.1.113883.6.96), and **MAY** be selected from CPT-4 (CodeSystem:

2345 2.16.840.1.113883.6.12), ICD9 Procedures (CodeSystem: 2.16.840.1.113883.6.104), ICD10 Procedure Coding System (CodeSystem: 2.16.840.1.113883.6.4). This code **SHOULD** be selected from ValueSet Cardiac Activity Procedures Value Set `1.3.6.1.4.1.19376.1.4.1.5.40`. (CONF:19207-CRC)

2350 b. This code **SHOULD** contain zero or one [0..1] **originalText** (CONF:19203).
   i. The originalText, if present, **SHOULD** contain zero or one [0..1] **reference** (CONF:7659).
      1. The originalText, if present, **SHOULD** contain zero or one [0..1] **@value** (CONF:19205).
         a. This reference/@value **SHALL** begin with a '#' and **SHALL** point to its corresponding narrative (using the approach defined in CDA Release 2, section 4.3.5.1) (CONF:19206).

6. **SHALL** contain exactly one [1..1] **statusCode**, where the @code **SHALL** be selected
2360 from ValueSet `ProcedureAct statusCode 2.16.840.1.113883.11.20.9.22` **DYNAMIC** (CONF:7661).
7. **SHOULD** contain zero or one [0..1] **effectiveTime** (CONF:7662).
8. **MAY** contain zero or one [0..1] **priorityCode**, where the @code **SHALL** be selected from ValueSet `ActPriority 2.16.840.1.113883.1.11.16866` **DYNAMIC**
2365 (CONF:7668).
9. **MAY** contain zero or one [0..1] **methodCode** (CONF:7670).
   a. methodCode **SHALL NOT** conflict with the method inherent in Procedure / code (CONF:7890).
10. **SHALL** contain at least one [1..*] **targetSiteCode** (CONF:7683-CRC).

2370 a. The targetSiteCode **SHALL** contain exactly one [1..1] **@code**, which **SHALL** be selected from ValueSet `Body Site Value Set 1.3.6.1.4.1.19376.1.4.1.5.32` **STATIC** (CONF:16082-CRC).
   b. This code **SHOULD** contain zero or one [0..1] **originalText** (CONF:CRC-xxx).

2375 i. The originalText, if present, **SHOULD** contain zero or one [0..1] **reference/@value** (CONF:CRC-xxx).
      1. This reference/@value **SHALL** begin with a '#' and **SHALL** point to its corresponding narrative (using the approach defined in CDA Release 2, section 4.3.5.1) (CONF:CRC-xxx).
      2. This text is used to describe the native or graft structures in the patient's coronary anatomy.

11. **MAY** contain zero or more [0..*] **specimen** (CONF:7697).
   a. This specimen is for representing specimens obtained from a procedure (CONF:16842).

2385 b. The specimen, if present, **SHALL** contain exactly one [1..1] **specimenRole** (CONF:7704).

i. This specimenRole **SHOULD** contain zero or more [0..*] **id** (CONF:7716).
    1. If you want to indicate that the Procedure and the Results are referring to the same specimen, the Procedure/specimen/specimenRole/id **SHOULD** be set to equal an Organizer/specimen/ specimenRole/id (CONF:7717).

12. **SHOULD** contain zero or more [0..*] **performer** (CONF:7718) such that it
    a. **SHALL** contain exactly one [1..1] **assignedEntity** (CONF:7720).
        i. This assignedEntity **SHALL** contain at least one [1..*] **id** (CONF:7722).
        ii. This assignedEntity **SHALL** contain exactly one [1..1] **addr** (CONF:7731).
        iii. This assignedEntity **SHALL** contain exactly one [1..1] **telecom** (CONF:7732).
        iv. This assignedEntity **SHOULD** contain zero or one [0..1] **representedOrganization** (CONF:7733).
            1. The representedOrganization, if present, **SHOULD** contain zero or more [0..*] **id** (CONF:7734).
            2. The representedOrganization, if present, **MAY** contain zero or more [0..*] **name** (CONF:7735).
            3. The representedOrganization, if present, **SHALL** contain exactly one [1..1] **addr** (CONF:7736).
            4. The representedOrganization, if present, **SHALL** contain exactly one [1..1] **telecom** (CONF:7737).
13. **MAY** contain zero or more [0..*] **participant** (CONF:7751) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="DEV" Device (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:7752).
    b. **SHALL** contain exactly one [1..1] **Product Instance** (templateId:2.16.840.1.113883.10.20.22.4.37) (CONF:15911).
14. **MAY** contain zero or more [0..*] **participant** (CONF:7765) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="LOC" Location (CodeSystem: HL7ParticipationType 2.16.840.1.113883.5.90) (CONF:7766).
    b. **SHALL** contain exactly one [1..1] **Service Delivery Location** (templateId:2.16.840.1.113883.10.20.22.4.32) (CONF:15912).
15. **MAY** contain zero or more [0..*] **entryRelationship** (CONF:7768) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="COMP" Has Component (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:7769).
    b. **SHALL** contain exactly one [1..1] **@inversionInd**="true" true (CONF:8009).
    c. **SHALL** contain exactly one [1..1] **encounter** (CONF:7770).
        i. This encounter **SHALL** contain exactly one [1..1] **@classCode**="ENC" Encounter (CodeSystem: HL7ActClass 2.16.840.1.113883.5.6) (CONF:7771).

ii. This encounter **SHALL** contain exactly one [1..1] **@moodCode**="EVN" Event (CodeSystem: ActMood 2.16.840.1.113883.5.1001) (CONF:7772).
iii. This encounter **SHALL** contain exactly one [1..1] **id** (CONF:7773).
1. Set the encounter ID to the ID of an encounter in another section to signify they are the same encounter (CONF:16843).

16. **MAY** contain zero or one [0..1] **entryRelationship** (CONF:7775) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="SUBJ" Has Subject (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:7776).
    b. **SHALL** contain exactly one [1..1] **@inversionInd**="true" true (CONF:7777).
    c. **SHALL** contain exactly one [1..1] **Instructions** (templateId:2.16.840.1.113883.10.20.22.4.20) (CONF:15913).
17. **MAY** contain zero or more [0..*] **entryRelationship** (CONF:7779) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="RSON" Has Reason (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:7780).
    b. **SHALL** contain exactly one [1..1] **Indication** (templateId:2.16.840.1.113883.10.20.22.4.19) (CONF:15914).
18. **MAY** contain zero or more [0..*] **entryRelationship** (CONF:7886) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="COMP" Has Component (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:7887).
    b. **SHALL** contain exactly one [1..1] **Medication Activity** (templateId:2.16.840.1.113883.10.20.22.4.16) (CONF:15915).
19. **MAY** contain zero or more [0..*] **entryRelationship** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="REFR" References (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:CRC-xxx).
    b. **SHALL** contain exactly one [1..1] **Procedure Device Organizer - Cardiac** (templateId:1.3.6.1.4.1.19376.1.4.1.4.12) (CONF:CRC-xxx).
20. **MAY** contain zero or one [0..1] **entryRelationship** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="REFR" References (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:CRC-xxx).
    b. **SHALL** contain exactly one [1..1] **Lesion Observation** (templateId:1.3.6.1.4.1.19376.1.4.1.10) (CONF:CRC-xxx). This refers to the lesion that this procedure is related to.

6.3.4.13.2 Procedure Device Organizer - Cardiac

[organizer: templateId 1.3.6.1.4.1.19376.1.4.1.4.12 (open)]

This Procedure Device Organizer – Cardiac entry content module identifies a set of observations related to a device used during procedures. It is intended to be used to further describe the devices used during these procedures.

1. **SHALL** contain exactly one [1..1] **@classCode**="CLUSTER" Cluster (CodeSystem: HL7ActClass 2.16.840.1.113883.5.6 **STATIC**) (CONF:CRC-xxx).
2. **SHALL** contain exactly one [1..1] **@moodCode**="EVN" Event (CodeSystem: ActMood 2.16.840.1.113883.5.1001) (CONF:CRC-xxx).
3. **SHALL** contain exactly one [1..1] **templateId** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.4.12" (CONF:CRC-xxx).
4. **SHALL** contain at least one [1..*] **id** (CONF:CRC-xxx).
5. **SHALL** contain exactly one [1..1] **statusCode** (CONF:CRC-xxx)..
    a. This statusCode **SHALL** contain exactly one [1..1] **@code** which **SHALL** be selected from CodeSystem: ActStatus 2.16.840.1.113883.5.14 (CONF:CRC-xxx).
6. **SHOULD** contain zero or one [0..1] **participant** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="SBJ" (CodeSystem: HL7ParticipationType 2.16.840.1.113883.5.90) (CONF:CRC-xxx).
    b. **SHALL** contain exactly one [1..1] **participantRole** (CONF:CRC-xxx).
        i. This participantRole **SHALL** contain exactly one [1..1] **@classCode**="MANU" Manufactured Product (CodeSystem: RoleClass 2.16.840.1.113883.5.110) (CONF:CRC-xxx).
        ii. This participantRole **SHALL** contain exactly one [1..1] **playingDevice** (CONF:CRC-xxx).
            1. This playingDevice **SHALL** contain exactly one [1..1] **@classCode**="MMAT" Manufactured Material (CodeSystem: EntityClass 2.16.840.1.113883.5.41) (CONF:CRC-xxx).
            2. This playingDevice **SHALL** contain exactly one [1..1] **code** (CONF:CRC-xxx).
        iii. This participantRole **SHALL** contain at least one [1..*] **id** (CONF:CRC-xxx).
7. **MAY** contain zero or more [0..*] **component** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **Device Observation** (templateId:1.3.6.1.4.1.19376.1.4.1.4.13) (CONF:CRC-xxx).

6.3.4.13.3 Device Observation

[observation: templateId 1.3.6.1.4.1.19376.1.4.1.4.13(open)]

This Device Observation entry represents observations made of devices used during a procedure, such as a cardiac procedure. An example of a device observation would be balloon inflation time.

1. **SHALL** contain exactly one [1..1] **@classCode**="OBS" Observation (CodeSystem: HL7ActClass 2.16.840.1.113883.5.6) (CONF:CRC-xxx).
2. **SHALL** contain exactly one [1..1] **@moodCode**="EVN" Event (CodeSystem: ActMood 2.16.840.1.113883.5.1001) (CONF:CRC-xxx).
3. **SHALL** contain exactly one [1..1] **templateId** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.4.13" (CONF:CRC-xxx).
4. **SHALL** contain at least one [1..*] **id** (CONF:CRC-xxx).
5. **SHALL** contain exactly one [1..1] **code** (CONF:CRC-xxx).
    a. **SHOULD** be from LOINC (CodeSystem: 2.16.840.1.113883.6.1) or SNOMED CT (CodeSystem: 2.16.840.1.113883.6.96) (CONF:CRC-xxx).
6. **SHOULD** contain zero or one [0..1] **text** (CONF:CRC-xxx).
    a. The text, if present, **SHOULD** contain zero or one [0..1] **reference/@value** (CONF:CRC-xxx).
        i. This reference/@value **SHALL** begin with a '#' and **SHALL** point to its corresponding narrative (using the approach defined in CDA Release 2, section 4.3.5.1) (CONF:CRC-xxx).
7. **SHALL** contain exactly one [1..1] **statusCode**="completed" Completed (CodeSystem: ActStatus 2.16.840.1.113883.5.14) (CONF:CRC-xxx).
8. **SHALL** contain exactly one [1..1] **effectiveTime** (CONF:CRC-xxx).
    a. This represents the clinically effective time of the measurement, which may be when the measurement was performed (e.g., a BP measurement), or may be when the sample was taken (and measured some time afterwards) (CONF:CRC-xxx).
9. **SHALL** contain exactly one [1..1] **value** with @xsi:type="ANY" (CONF:CRC-xxx).

6.3.4.14 Procedure Specimens Taken Section 59773-2

[section: templateId 2.16.840.1.113883.10.20.22.2.31(open)]

This Procedure Specimens Taken section is used exactly as specified in C-CDA - section 4.51.

The Procedure Specimens Taken section records the tissues, objects, or samples taken from the patient during the procedure including biopsies, aspiration fluid, or other samples sent for pathological analysis. The narrative may include a description of the specimens.


```
<section>
   <templateId root="2.16.840.1.113883.10.20.22.2.31"/>
   <code code="59773-2"
         codeSystem="2.16.840.1.113883.6.1"
         codeSystemName="LOINC"
         displayName="PROCEDURE SPECIMENS TAKEN"/>
   <title>Procedure Specimens Taken</title>
   <text>Ascending colon polyp</text>
</section>
```

Figure 6.3.4.14-1: Procedure specimens taken section example

6.3.4.15 Procedure Disposition Section 59775-7

[section: templateId 2.16.840.1.113883.10.20.18.2.12(open)]

This Procedure Disposition section is used exactly as specified in C-CDA - section 4.46.

```
<section>
  <templateId root="2.16.840.1.113883.10.20.18.2.12"/>
  <code code="59775-7" codeSystem="2.16.840.1.113883.6.1"
        codeSystemName="LOINC"
        displayName="PROCEDURE DISPOSITION"/>
  <title>PROCEDURE DISPOSITION</title>
  <text>The patient was taken to the ICU Recovery Unit in stable
        condition.</text>
</section>
```

Figure 6.3.4.15-1: Procedure disposition section example

6.3.4.16 Procedure Results - Cardiac Section 30954-2

[section: templateId 1.3.6.1.4.1.19376.1.4.1.2.20 (open)]

([section: templateId 2.16.840.1.113883.10.20.22.2.3.1(open)] – parent)

This Procedure Results – Cardiac section content module records clinically significant results confirmed or discovered during the procedure. Results include findings, measurements, calculations, and observations.

For this CRC profile, this Procedure Results – Cardiac section content module should be organized using Procedure Results Organizer – Cardiac entry content modules for specific categories (e.g., right heart cath findings, coronary anatomy findings, left heart cath findings, and PCI findings). There shall be a Procedure Result Organizer – Cardiac entry content module for one or more of these categories of findings. The allowed categories are defined in ValueSet CRC Procedure Findings Types Value Set 1.3.6.1.4.1.19376.1.4.1.5.43 which can be expanded to include other procedures.

Result Observation – Cardiac entries are used to record specific findings (e.g., stenosis, timi flow, lesion characteristics, or wall motion characteristics) in each category. The specific findings should be selected from the Result Observations Constraints Set `1.3.6.1.4.1.19376.1.4.1.5.38`. Note that these findings may apply to lesions and coronary anatomy.

This Procedure Results – Cardiac section content module is a modification of the C-CDA Results Section with Coded Entries Required (C-CDA 4.48). The modifications are highlighted in yellow below. This Procedure Results – Cardiac section content module is also conformant to the C-CDA Results Section content module.

1. **SHALL** contain three or more [3..*] **templateId** (CONF:7108-CRC) such that it
    a. **SHALL** contain exactly one [1..1] **@root**="2.16.840.1.113883.10.20.22.2.3" (CONF:9136).
    b. **SHALL** contain exactly one [1..1] **@root**="2.16.840.1.113883.10.20.22.2.3.1" (CONF:9137).
    c. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.2.20" (CONF:CRC-xxx).
2. **SHALL** contain exactly one [1..1] **code** (CONF:15433).
    a. This code **SHALL** contain exactly one [1..1] **@code**="30954-2" Relevant diagnostic tests and/or laboratory data (CodeSystem: LOINC 2.16.840.1.113883.6.1) (CONF:15434).
3. **SHALL** contain exactly one [1..1] **title** (CONF:8892).
4. **SHALL** contain exactly one [1..1] **text** (CONF:7111).
5. **SHALL** contain at least one [1..*] **entry** (CONF:7112-CRC) such that it
    a. **SHALL** contain exactly one [1..1] **Procedure Results Organizer - Cardiac** (templateId:1.3.6.1.4.1.19376.1.5.3.1.4.15) (CONF:7113-CRC).

```
<section>
    <templateId root="21.3.6.1.4.1.19376.1.4.1.2.20" />
    <templateId root="2.16.840.1.113883.10.20.22.2.3.1" />
    <templateId root="2.16.840.1.113883.10.20.22.2.3" />
    <code code="30954-2"
          codeSystem="2.16.840.1.113883.6.1"
          codeSystemName="LOINC"
          displayName="RESULTS" />
    <title>Procedure results</title>
       <text>
       Left Main:  No significant narrowing noted. Proximal LAD:  No significant
       narrowing Noted. Mid/Distal LAD, Diag Branches:  No significant
       narrowing noted. RCA, RPDA, RPL, AM Branches:  The distal RCA has a
       stenosis of 90 percent. Circ., OMs, LPDA, LPL Branches:  The proximal
       Left Circumflex has a stenosis of 80 percent. Ramus:  No Significant
       narrowing noted.
        <content ID="observation1">Post procedure stenosis of the Distal RCA is
0%.</content>
        <content ID="severity3">Moderate to severe</content>
       </text>
    <entry>
      <organizer classCode="CLUSTER" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.22.4.1"/>
        <!-- Procedure Results Organizer - Cardiac -->
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.15"/>
        <id root="7d5a02b0-67a4-11db-bd13-0800200c9a66"/>
        <code code="500786010" displayName="Left Heart Cath Procedure"
              codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"/>
        <statusCode code="completed"/>
        <component>
          <observation classCode="OBS" moodCode="EVN">
            <!-- Result observation – cardiac template -->
            <templateId root="1.3.6.1.4.1.19376.1.4.1.4.16"/>
            <templateId root="2.16.840.1.113883.10.20.22.4.2"/>
            <id root="c6f88321-67ad-11db-bd13-0800200c9a66"/>
            <code code="233970002" codeSystem="2.16.840.1.113883.6.96"
                  codeSystemName="SNOMED CT"
                  displayName="Post procedure stenosis"/>
            <text><reference value="observation1"/></text>
            <statusCode code="completed"/>
            <effectiveTime value="19991114"/>
            <targetSiteCode code="41879009"
                            codeSystem="2.16.840.1.113883.6.96"
                            displayName="Distal RCA"/>
```



```
            <value xsi:type="PQ" value="0" unit="%"/>
            <interpretationCode code="N" codeSystem="2.16.840.1.113883.5.83"/>
            <entryRelationship typeCode=”SUBJ” inversionInd=”TRUE”>
              <observation classCode="OBS" moodCode="EVN">
                <!-- Severity observation template -->
                <templateId root=" 2.16.840.1.113883.10.20.22.4.8"/>
                <id root="c6f88321-67ad-11db-bd13-0800200c9a66" ext=”Lesion1”/>
                <code code="SEV" displayName="Severity Observation"
                      codeSystem="2.16.840.1.113883.5.4"
                      codeSystemName="ActCode"/>
                <text><reference value="#severity3"/></text>
                <statusCode code="completed"/>
                <value xsi:type="CD" code="371924009"
                       displayName="Moderate to severe"
                       codeSystem="2.16.840.1.113883.6.96"
                       codeSystemName="SNOMED CT"/>
              </observation>
            </entryRelationship>
          </observation>
        </component>
        <component>
          <observation classCode="OBS" moodCode="EVN">
            <!-- Result observation – cardiac template -->
            <templateId root="1.3.6.1.4.1.19376.1.4.1.4.16"/>
            ...
          </observation>
        </component>
        <entryRelationship typeCode=”REFR”>
          <observation classCode="OBS" moodCode="EVN">
            <!-- Lesion observation template -->
            <templateId root="1.3.6.1.4.1.19376.1.4.1.4.10"/>
            <id root="2.840.110893.98120.74.8" ext=”lesion #1” />
            <code code="404684003" displayName="Finding"
                  codeSystem="2.16.840.1.113883.6.96"
                  codeSystemName="SNOMED CT"/>
          </observation>
        </entryRelationship>
      </organizer>
    </entry>
</section>
```

Figure 6.3.4.16-1: Results section example

6.3.4.16.1 Procedure Results Organizer - Cardiac

[organizer: templateId 1.3.6.1.4.1.19376.1.5.3.1.4.15 (open)]

([observation: templateId 2.16.840.1.113883.10.20.22.4.1(open)] – parent)

This Procedure Results Organizer – Cardiac entry content module identifies a set of related procedure results, findings and observations. It contains information applicable to all of the contained procedure findings, including the lesion for PCI procedures. Related

procedure findings type codes categorize a finding into one of several commonly accepted values (e.g., “Right heart cath”, “Left heart cath”, “PCI”).

This Procedure Results Organizer – Cardiac entry content module is a modification of the C-CDA Result Organizer Section (C-CDA 5.71). The modifications are highlighted in yellow below. This Procedure Results Organizer – Cardiac entry content module is also conformant to the C-CDA Results Organizer entry content module.

1. **SHALL** contain exactly one [1..1] **@classCode** (CONF:7121).
    a. **SHALL** contain exactly one [1..1] @classCode="CLUSTER" Cluster (CodeSystem: 2.16.840.1.113883.5.6 HL7ActClass) (CodeSystem: 2.16.840.1.113883.5.6 HL7ActClass) (CONF: 7165-xxx).
2. **SHALL** contain exactly one [1..1] **@moodCode**="EVN" Event (CodeSystem: ActMood 2.16.840.1.113883.5.1001) (CONF:7122).
3. **SHALL** contain two or more [2..*] **templateId** (CONF:7126-CRC) such that it
    a. **SHALL** contain exactly one [1..1] **@root**="2.16.840.1.113883.10.20.22.4.1" (CONF:9134).
    b. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.5.3.1.4.15" (CONF:CRC-xxx).
4. **SHALL** contain at least one [1..*] **id** (CONF:7127).
5. **SHALL** contain exactly one [1..1] **code** (CONF:7128).
    a. **SHOULD** be selected from CRC procedure findings types found in ValueSet CRC Procedure Findings Types Value Set 1.3.6.1.4.1.19376.1.4.1.5.43 or **MAY** be selected from LOINC (codeSystem 2.16.840.1.113883.6.1) or SNOMED CT (codeSystem 2.16.840.1.113883.6.96), or CPT-4 (codeSystem 2.16.840.1.113883.6.12) (CONF:19219-CRC).
6. **SHALL** contain exactly one [1..1] **statusCode** (CONF:7123).
    a. This statusCode **SHALL** contain exactly one [1..1] **@code** which **SHALL** be selected from ValueSet ResultStatus 2.16.840.1.113883.11.20.9.39 **STATIC** (CONF:14848).
7. **SHALL** contain at least one [1..*] **component** (CONF:7124) such that it
    a. **SHALL** contain exactly one [1..1] **Result Observation - Cardiac** (templateId:1.3.6.1.4.1.19376.1.4.1.4.16) (CONF:14850-CRC).
8. **MAY** contain zero or one [0..1] **entryRelationship** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="REFR" References (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:CRC-xxx).
    b. **SHALL** contain exactly one [1..1] **Lesion Observation** (templateId:1.3.6.1.4.1.19376.1.4.1.10) (CONF:CRC-xxx). This refers to the lesion that these results are related to.

6.3.4.16.2 Result Observation - Cardiac

`[observation: templateId 1.3.6.1.4.1.19376.1.4.1.4.16 (open)]`

([observation: templateId 2.16.840.1.113883.10.20.22.4.2(open)] – parent)

A result observation is a clinical statement that a clinician has noted during the Cath Lab procedure. This Result Observation – Cardiac entry content module is used to describe the specific procedure findings that were observed during the specific Cath Lab procedure.

The specific result observations are defined in the Result Observations Constraints Set `1.3.6.1.4.1.19376.1.4.1.5.38`.

The targetSiteCode may be used for diagnostic cath procedures.

This Result Observation – Cardiac entry content module is a modification of the C-CDA Result Observation (C-CDA 5.70). The modifications are highlighted in yellow below. This Result Observation – Cardiac entry content module is also conformant to the C-CDA Result Observation entry content module.

1. **SHALL** contain exactly one [1..1] **@classCode**="OBS" Observation (CodeSystem: HL7ActClass 2.16.840.1.113883.5.6) (CONF:7130).
2. **SHALL** contain exactly one [1..1] **@moodCode**="EVN" Event (CodeSystem: ActMood 2.16.840.1.113883.5.1001) (CONF:7131).
3. **SHALL** contain two or more [2..*] **templateId** (CONF:7136-CRC) such that it
   a. **SHALL** contain exactly one [1..1] **@root**="2.16.840.1.113883.10.20.22.4.2" (CONF:9138).
   b. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.4.16" (CONF:CRC-xxx).
4. **SHALL** contain at least one [1..*] **id** (CONF:7137).
5. **SHALL** contain exactly one [1..1] **code** (CONF:7133).
   a. **SHOULD** be from LOINC (CodeSystem: 2.16.840.1.113883.6.1) or SNOMED CT (CodeSystem: 2.16.840.1.113883.6.96) or Result Observations Constraints Set (1.3.6.1.4.1.19376.1.4.1.5.38) (CONF:19211-CRC).
6. **SHOULD** contain zero or one [0..1] **text** (CONF:7138).
   a. The text, if present, **SHOULD** contain zero or one [0..1] **reference** (CONF:15924).
      i. The reference, if present, **SHOULD** contain zero or one [0..1] **@value** (CONF:15925).
         1. This reference/@value **SHALL** begin with a '#' and **SHALL** point to its corresponding narrative (using the approach defined in CDA Release 2, section 4.3.5.1) (CONF:15926).
7. **SHALL** contain exactly one [1..1] **statusCode** (CONF:7134).
   a. This statusCode **SHALL** contain exactly one [1..1] **@code** which **SHALL** be selected from ValueSet Result Status 2.16.840.1.113883.11.9.39) **STATIC** (CONF:14849).

8. **SHALL** contain exactly one [1..1] **effectiveTime** (CONF:7140).
    a. Represents clinically effective time of the measurement, which may be when the measurement was performed (e.g., a BP measurement), or may be when sample was taken (and measured some time afterwards) (CONF:16838).
9. **SHALL** contain exactly one [1..1] **value** (CONF:7143).
10. **SHOULD** contain zero or more [0..*] **interpretationCode** (CONF:7147).
11. **MAY** contain zero or one [0..1] **methodCode** (CONF:7148).
12. **MAY** contain zero or one [0..1] **targetSiteCode** (CONF:7153).
    a. The targetSiteCode, if present, **SHALL** contain exactly one [1..1] **code** where the @code **SHALL** be selected from ValueSet `Body Site Value Set 1.3.6.1.4.1.19376.1.4.1.5.32` **STATIC** (CONF:CRC-xxx).
13. **MAY** contain zero or one [0..1] **author** (CONF:7149).
14. **SHOULD** contain zero or more [0..*] **referenceRange** (CONF:7150).
    a. The referenceRange, if present, **SHALL** contain exactly one [1..1] **observationRange** (CONF:7151).
        i. This observationRange **SHALL NOT** contain [0..0] **code** (CONF:7152).
15. **SHOULD** contain zero or one [0..1] **entryRelationship** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@typeCode**="SUBJ" Has subject (CodeSystem: `HL7ActRelationshipType 2.16.840.1.113883.5.1002`) (CONF:CRC-xxx).
    b. **SHALL** contain exactly one [1..1] **@inversionInd**="true" TRUE (CONF:CRC-xxx).
    c. **SHALL** contain exactly one [1..1] **Severity Observation** (`templateId:2.16.840.1.113883.10.20.22.4.8`) (CONF:CRC-xxx).

6.3.4.17 Complications Section 55109-3

[`section: templateId 2.16.840.1.113883.10.20.22.2.37(open)`]

This Complications section content module records problems that occurred during the cath lab procedure. The complications may have been known risks or unanticipated problems.

This Complications section content module is used exactly as specified in C-CDA - section 4.8, except for vocabulary constraints for Problem Observation entries.

There is a CRC specific value set defined for complications recorded as Problem Observation entries in this Complications section content module.

```
<section>
  <templateId root=”2.16.840.1.113883.10.20.22.2.37”/>
  <code code=”55109-3” codeSystem=”2.16.840.1.113883.6.1”
        codeSystemName=”LOINC”
        displayName=”Complications”/>
  <title>Complications</title>
  <text>Complications for the cath procedure for patient included:
        x, y, z…
  </text>
  <entry>
    <observation classCode=”OBS” moodCode=”EVN”>
      <templateId root=”2.16.840.1.113883.10.20.22.4.4”/>
      <id root=”d11275e7-67ae-11db-bd13-0800200c9a66”/>
      <code code=”404684003” codeSystem=”2.16.840.1.113883.6.96”
            displayName=”Finding”/>
      <text>The patient has had a myocardial infarction..</text>
      <statusCode code=”completed”/>
      <effectiveTime>
         <low value=”201201251000”/>
      </effectiveTime>
      <value xsi:type=”CD” code=”22298006”
            codeSystem=”2.16.840.1.113883.6.96” codeSystemName=”SNOMED CT”
            displayName=”Myocardial Infarction (Biomarker Positive)”/>
      <entryRelationship typeCode="REFR">
         <observation classCode="OBS" moodCode="EVN">
           <templateId root="2.16.840.1.113883.10.20.22.4.6"/>
           <!-- Problem Status template -->
           <code code="33999-4" codeSystem="2.16.840.1.113883.6.1"
                 codeSystemName="LOINC" displayName="Status"/>
           <statusCode code="completed"/>
           <value xsi:type="CD" code="55561003"
                  codeSystem="2.16.840.1.113883.6.96"
                  codeSystemName="SNOMED CT" displayName="Active"/>
         </observation>
      </entryRelationship>
    </observation>
  </entry>
  <entry>
    <observation classCode=”OBS” moodCode=”EVN”>
      <templateId root=”1.3.6.1.4.1.19376.1.4.1.4.9”/>
      <id root=”xyz”/>
      …
    </observation>
  </entry>
</section>
```

Figure 6.3.4.17-1: Complications section example

6.3.4.17.1 Problem Observation – Constraints

`[observation: templateId 2.16.840.1.113883.10.20.22.4.4 (open)]`

A problem is a clinical statement that a clinician has noted during the Cath procedure. This entry is used to describe the presence or absence of specific “complications” as defined by ACC.

This Problem Observation entry content module is used exactly as specified in C-CDA - section 5.59, except for vocabulary constraints.

The value set for CONF:9058 (**`value@code`**) **SHOULD** be selected from ValueSet Complications Value Set `1.3.6.1.4.1.19376.1.4.1.5.46` **STATIC.**

6.3.4.18 Postprocedure Diagnosis Section 59769-0

[`section`: `templateId` `2.16.840.1.113883.10.20.22.2.36(open)`]

The Postprocedure Diagnosis section content module records the diagnosis or diagnoses discovered or confirmed during the procedure. Often it is the same as the pre-procedure diagnosis or indication.

This Postprocedure Diagnosis section content module is used exactly as specified in C-CDA - section 4.42, except for vocabulary constraints.

There is a CRC specific value set defined for problem observations recorded as part of postprocedure diagnosis which is included in the Problem Observation entry.

```
<section>
   <templateId root="2.16.840.1.113883.10.20.22.2.36"/>
   <code code="59769-0" codeSystem="2.16.840.1.113883.6.1"
      codeSystemName="LOINC" displayName="POSTPROCEDURE DIAGNOSIS"/>
   <title>Postprocedure Diagnosis</title>
   <text>It was observed that there was complication of myocardial
         infarction during the cath procedure.</text>
   <entry>
      <act moodCode="EVN" classCode="ACT">
         <templateId root="2.16.840.1.113883.10.20.22.4.51"/>
         <!-- ** Postprocedure Diagnosis Entry ** -->
         <code code="59769-0" codeSystem="2.16.840.1.113883.6.1"
               codeSystemName="LOINC"
               displayName="Postprocedure Diagnosis"/>
         <entryRelationship typeCode="SUBJ">
            <observation classCode="OBS" moodCode="EVN">
               <templateId root="2.16.840.1.113883.10.20.22.4.4"/>
               <!-- Problem Observation template -->
               <id root=”d11275e7-67ae-11db-bd13-0800200c9a66”/>
               <code code=”404684003” codeSystem=”2.16.840.1.113883.6.96”
                     codeSystemName=”SNOMED CT”
                     displayName=”Finding”/>
               <text>It was observed that there was complication of myocardial
                     infarction during the cath procedure.</text>
               <statusCode code=”completed”/>
               <effectiveTime>
                  <low value=”201201251000”/>
               </effectiveTime>
               <value xsi:type=”CD” code=”22298006”
                      codeSystem=”2.16.840.1.113883.6.96”
                      codeSystemName=”SNOMED CT”
                      displayName=”Myocardial Infarction (Biomarker
Positive)”/>
               <entryRelationship typeCode="REFR">
                 <observation classCode="OBS" moodCode="EVN">
                    <templateId root="2.16.840.1.113883.10.20.22.4.6"/>
                    <!-- Problem Status template -->
                    <code code="33999-4" codeSystem="2.16.840.1.113883.6.1"
                          codeSystemName="LOINC" displayName="Status"/>
                    <statusCode code="completed"/>
                    <value xsi:type="CD" code="55561003"
                           codeSystem="2.16.840.1.113883.6.96"
                           codeSystemName="SNOMED CT" displayName="Active"/>
                 </observation>
               </entryRelationship>
            </observation>
         </entryRelationship>
         ...
      </act>
   </entry>
</section>
```

Figure 6.3.4.18-1: Postprocedure diagnosis section example

6.3.4.18.1 Problem Observation – Constraints

[observation: templateId 2.16.840.1.113883.10.20.22.4.4 (open)]

The Problem Observation entry is used to describe a final diagnosis.

This Problem Observation entry is used exactly as specified in C-CDA - section 5.59, except for vocabulary constraints.

The value set for CONF:9058 (**value**) **SHOULD** be selected from ValueSet CRC Postprocedure Diagnosis Value Set 1.3.6.1.4.1.19376.1.4.1.5.44 **STATIC**.

6.3.4.19 Plan of Care - Cardiac Section 18776-5

[section: templateId 1.3.6.1.4.1.19376.1.4.1.2.22 (open)]

([section: templateId 2.16.840.1.113883.10.20.22.2.10(open)] – parent)

This Plan of Care - Cardiac section content module is intended to be used to describe the post-procedure plan.

The Plan of Care - Cardiac section content module contains data that defines pending orders, interventions, encounters, services, and procedures for the patient. It is limited to prospective, unfulfilled, or incomplete orders and requests only, which are indicated by the @moodCode of the entries within this section. All active, incomplete, or pending orders, appointments, referrals, procedures, services, or any other pending event of clinical significance to the current care of the patient should be listed unless constrained due to privacy issues. The plan may also contain information about ongoing care of the patient and information regarding goals and clinical reminders. Clinical reminders are placed here to provide prompts for disease prevention and management, patient safety, and health-care quality improvements, including widely accepted performance measures. The plan may also indicate that patient education was given or will be provided.

This Plan of Care – Cardiac section content module is a modification of the C-CDA Plan of Care section (C-CDA 4.39). The modifications are highlighted in yellow below. This Plan of Care – Cardiac section content module is also conformant to the C-CDA Plan of Care section content module.

1. **SHALL** contain two or more [2..*] **templateId** (CONF:7723-CRC) such that it
   a. **SHALL** contain exactly one [1..1] **@root**="2.16.840.1.113883.10.20.22.2.10" (CONF:10435).
   b. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.2.22" (CONF:CRC-xxx).
2. **SHALL** contain exactly one [1..1] **code** (CONF:14749).
   a. This code **SHALL** contain exactly one [1..1] **/@code**="18776-5" Plan of Care (CodeSystem: LOINC 2.16.840.1.113883.6.1) (CONF:14750).
3. **SHALL** contain exactly one [1..1] **title** (CONF:16986).
4. **SHALL** contain exactly one [1..1] **text** (CONF:7725).

5. **MAY** contain zero or more [0..*] **entry** (CONF:7726) such that it
    a. **SHALL** contain exactly one [1..1] **Plan of Care Activity Act - Cardiac** (templateId:1.3.6.1.4.1.19376.1.4.1.4.17) (CONF:14751-CRC).
6. **MAY** contain zero or more [0..*] **entry** (CONF:8805) such that it
    a. **SHALL** contain exactly one [1..1] **Plan of Care Activity Encounter** (templateId:2.16.840.1.113883.10.20.22.4.40) (CONF:14752).
7. **MAY** contain zero or more [0..*] **entry** (CONF:8807) such that it
    a. **SHALL** contain exactly one [1..1] **Plan of Care Activity Observation** (templateId:2.16.840.1.113883.10.20.22.4.44) (CONF:14753).
8. **MAY** contain zero or more [0..*] **entry** (CONF:8809) such that it
    a. **SHALL** contain exactly one [1..1] **Plan of Care Activity Procedure** (templateId:2.16.840.1.113883.10.20.22.4.41) (CONF:14754).
9. **MAY** contain zero or more [0..*] **entry** (CONF:8811) such that it
    a. **SHALL** contain exactly one [1..1] **Plan of Care Activity Substance Administration** (templateId:2.16.840.1.113883.10.20.22.4.42) (CONF:14755).
10. **MAY** contain zero or more [0..*] **entry** (CONF:8813) such that it
    a. **SHALL** contain exactly one [1..1] **Plan of Care Activity Supply** (templateId:2.16.840.1.113883.10.20.22.4.43) (CONF:14756).
11. **MAY** contain zero or more [0..*] **entry** (CONF:14695) such that it
    a. **SHALL** contain exactly one [1..1] **Instructions** (templateId:2.16.840.1.113883.10.20.22.4.20) (CONF:16751).

```
<section>
   <templateId root="1.3.6.1.4.1.19376.1.4.1.2.22" />
   <templateId root="2.16.840.1.113883.10.20.22.2.10" />
   <!--  **** Plan of Care – Cardiac section template  **** -->
   <code code="18776-5" codeSystem="2.16.840.1.113883.6.1"
      codeSystemName="LOINC" displayName="Treatment plan"/>
   <title>Plan of Care</title>
   <text>
      ...
   </text>
   <entry>
      <act moodCode="RQO" classCode="ACT">
         <!--  ****  Plan of Care Activity Act - Cardiac template   **** -->
         <templateId root="1.3.6.1.4.1.19376.1.4.1.4.17"/>
         <templateId root="2.16.840.1.113883.10.20.22.4.39"/>
         <id root="9a6d1bac-17d3-4195-89a4-1121bc809a5c"/>
         <code code="415070008" codeSystem="2.16.840.1.113883.6.96"
               displayName="PCI without planned CABG"/>
         <statusCode code="new"/>
         <effectiveTime>
            <center value="20000421"/>
         </effectiveTime>
      </act>
   </entry>
</section>
```

Figure 6.3.4.19-1: Plan of care section example

6.3.4.19.1 Plan of Care Activity Act - Cardiac

[act: templateId 1.3.6.1.4.1.19376.1.4.1.4.17 (open)]

([act: templateId 2.16.840.1.113883.10.20.22.4.39(open)] – parent)

This Plan of Care Activity Act – Cardiac entry content module is a modification of the C-CDA Plan of Care Activity Act (C-CDA 5.46). The modifications are highlighted in yellow below. This Plan of Care Activity Act – Cardiac entry content module is also conformant to the C-CDA Plan of Care Activity Act entry content module.

1. **SHALL** contain exactly one [1..1] **@classCode**="ACT" (CodeSystem: HL7ActClass 2.16.840.1.113883.5.6) (CONF:8538).
2. **SHALL** contain exactly one [1..1] **@moodCode**, which **SHALL** be selected from ValueSet Plan of Care moodCode (Act/Encounter/Procedure) 2.16.840.1.113883.11.20.9.23 **STATIC** 2011-09-30 (CONF:8539).
3. **SHALL** contain two or more [2..*] **templateId** (CONF:8544-CRC) such that it
   a. **SHALL** contain exactly one [1..1] **@root**="2.16.840.1.113883.10.20.22.4.39" (CONF:10510).

b. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.4.17" (CONF:CRC-xxx).

4. **SHALL** contain at least one [1..*] **id** (CONF:8546).
5. **SHALL** contain exactly one [1..1] **code** (CONF:CRC-xxx)
    a. This code **SHALL** contain exactly one [1..1] **/@code** which **SHOULD** be selected from ValueSet Rx Recommendation 1.3.6.1.4.1.19376.1.4.1.5.42 **STATIC** (CONF:CRC-XXX).
6. **SHOULD** contain zero or one [0..1] **effectiveTime** (CONF:CRC-xxx).

6.3.4.20 Key Images – Cardiac Section – DCM 121180

[section: templateId 1.3.6.1.4.1.19376.1.4.1.2.21(open)]

The Key Images section content module contains narrative description of and references to DICOM Image Information Objects that illustrate the findings of the procedure reported.

1. **SHALL** contain exactly one [1..1] **templateId** (CONF:CRC-xxx) such that it
    a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.2.21" (CONF:CRC-xxx).
2. **SHALL** contain exactly one [1..1] **code** (CONF:CRC-xxx).
    a. This code **SHALL** contain exactly one [1..1] **@code**="121180" Key Images (CodeSystem: 1.2.840.10008.2.16.4 DCM) (CONF:CRC-xxx).
3. **SHALL** contain exactly one [1..1] **text** (CONF:CRC-xxx).
4. **SHALL** contain at least one [1..*] **entry** (CONF:CRC-xxx)
    a. **SHALL** contain exactly one [1..1] **Sop Instance Observation** (templateId:2.16.840.1.113883.10.20.6.2.8) (CONF:CRC-xxx).

6.3.5 Common Entry Content Modules

6.3.5.1 Problem Observation – Cardiac

[Observation: templateId 1.3.6.1.4.1.19376.1.4.1.9(open)]

([Observation: templateId 2.16.840.1.113883.10.20.22.4.4(open)] – parent)

A problem is a clinical statement that a clinician has noted. In health care it is a condition that requires monitoring or diagnostic, therapeutic, or educational action. It also refers to any unmet or partially met basic human need. In cardiology, problems include hypertension, diabetes, and dyslipidemia.

This Problem Observation – Cardiac entry content module extends the C-CDA Problem Observation entry definition (C-CDA 5.59) by adding the following constraints:

1. **SHALL** contain exactly one [1..1] **templateId** (CONF:CRC-xxx) such that it

a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.9" (CONF:CRC-xxx).

2. **MAY** contain zero or one [0..1] **entryRelationship** (CONF:CRC-xxx) such that it
   a. **SHALL** contain exactly one [1..1] **@typeCode**="SUBJ" Has subject (CodeSystem: HL7ActRelationshipType 2.16.840.1.113883.5.1002) (CONF:CRC-xxx).
   b. **SHALL** contain exactly one [1..1] **@inversionInd**="true" TRUE (CONF:CRC-xxx).
   c. **SHALL** contain exactly one [1..1] **Severity Observation** (templateId:2.16.840.1.113883.10.20.22.4.8) (CONF:CRC-xxx).

6.3.5.2 Lesion Observation

[Observation: templateId 1.3.6.1.4.1.19376.1.4.1.10(open)]

This Lesion Observation entry content module identifies a lesion of interest for a PCI procedure. The lesion is identified by a global ID in the **id** element and one or more target sites.

1. **SHALL** contain exactly one [1..1] **@classCode**="OBS" Observation (CodeSystem: HL7ActClass 2.16.840.1.113883.5.6) (CONF:CRC-xxx).
2. **SHALL** contain exactly one [1..1] **@moodCode**="EVN" Event (CodeSystem: ActMood 2.16.840.1.113883.5.1001) (CONF:CRC-xxx).
3. **SHALL** contain exactly one [1..1] **templateId** (CONF:7299) such that it
   a. **SHALL** contain exactly one [1..1] **@root**="1.3.6.1.4.1.19376.1.4.1.10" (CONF:CRC-xxx).
4. **SHALL** contain at least one [1..*] **id** (CONF:CRC-xxx)
   a. where the **@root SHALL** be a globally unique root and the **@ext SHALL** be a text string representing the lesion ID (CONF:CRC-xxx).
5. **SHALL** contain exactly one [1..1] **code**, where the @code **SHOULD** be “404684003” selected from SNOMED CT and has @displayName=”Finding” (CONF:CRC-xxx).
6. **SHOULD** contain zero or one [0..1] **text** (CONF:CRC-xxx).
   a. The text, if present, **SHOULD** contain zero or one [0..1] **reference/@value** (CONF:CRC-xxx).
      i. This reference/@value **SHALL** begin with a '#' and **SHALL** point to its corresponding narrative (using the approach defined in CDA Release 2, section 4.3.5.1) (CONF:CRC-xxx).
7. **MAY** contain zero or more [0..*] **targetSiteCode**, where the @code **SHOULD** be selected from ValueSet Body Site 1.3.6.1.4.1.19376.1.4.1.5.32 **STATIC** (CONF:CRC-xxx).
   a. The targetSiteCode, if present **MAY** contain zero or more [0..*] **qualifier** to further identify the exact location of the lesion (CONF:CRC-xxx).

6.3.6 Cath Report Content Vocabulary Constraints

6.3.6.1 Cardiac problems/concerns - Vocabulary Constraints

The content creator shall be capable of creating a problem/concern selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.31, listed below.

Table 6.3.6.1-1: Cardiac problems/concerns 1.3.6.1.4.1.19376.1.4.1.5.31 STATIC

Coding Scheme / Concept	SNOMED CT
Hypertension	38341003
Dyslipidemia	370992007
Diabetes	73211009
Acute renal failure	14669001
Chronic kidney disease	236425005
Peripheral arterial disease	399957001
Cerebrovascular disease	62914000
Erectile dysfunction	398175007
Cardiac arrhythmia	44808001
Asthma	195967001
Bronchospasm	4386001
Implanted pacemaker	371821000
Heart failure	84114007
Myocardial infarction	22298006
Angina	194828000
Currently on Dialysis (dependence on renal dialysis)	105502003
Chronic Lung Disease	413839001
Cardiomyopathy or Left Ventricular Systolic Dysfunction	134401001
Cardiogenic Shock	89138009
Cardiac Arrest	410429000
Prior MI	22298006
Prior Valve Surgery/Procedure	73544002
Prior PCI	415070008
Prior CABG	232717009
Angina Type	Pick one from Value Set 1.3.6.1.4.1.19376.1.4.1.5.49

6.3.6.2 Body Site Value Set - Vocabulary Constraint

The content creator shall be capable of creating a body site selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.32, listed below. This structure is used to represent the native coronary structure of the heart.

Table 6.3.6.2-1: Body Site Value Set 1.3.6.1.4.1.19376.1.4.1.5.32 STATIC

Coding Scheme / Concept	SNOMED CT
Left Main Coronary Artery	3227004
Left Main Coronary Artery Ostium	76862008
Left Anterior Descending Coronary Artery	59438005
Proximal Left Anterior Descending Coronary Artery	68787002
Mid Left Anterior Descending Coronary Artery	91748002
Distal Left Anterior Descending Coronary Artery	36672000
Left Posterior Descending Artery	56322004
Left Posterior Descending Circumflex Coronary Artery	91760001
Left Posterolateral Circumflex Coronary Artery	57823005
Right Coronary Artery	13647002
Right Coronary Artery Ostium	56789007
Proximal Right Coronary Artery	91083009
Mid Right Coronary Artery	450960006
Distal Right Coronary Artery	41879009
Circumflex Coronary Artery	57396003
Proximal Circumflex Coronary Artery	52433000
Mid Circumflex Coronary Artery	91753007
Distal Circumflex Coronary Artery	6511003
Posterior Descending Right Coronary Artery	53655008
Intermediate Artery (Ramus)	244252004
Right posterior AV Coronary Artery	12800002
1st Diagonal Coronary Artery	91750005
1st Left Posterolateral Coronary Artery	91757008
1st Marginal Coronary Artery	91754001
1st Right posterolateral Coronary Artery	91761002
1st Septal Coronary Artery	244251006
2nd Diagonal Coronary Artery	91751009
2nd Left Posterolateral Coronary Artery	91758003
2nd Marginal Coronary Artery	91755000
2nd Right Posterolateral Coronary Artery	91762009
3rd Diagonal Coronary Artery	91752002

Concept / Coding Scheme	SNOMED CT
3rd Left Posterolateral Coronary Artery	91759006
3rd Marginal Coronary Artery	91756004
3rd Right posterolateral Coronary Artery	91763004
Marginal Right Coronary Artery	22765000
AV groove continuation of Circumflex Artery	75902001

6.3.6.3 Cardiovascular Family History - Vocabulary Constraint

The content creator shall be capable of creating a family history selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.33, listed below.

Table 6.3.6.3-1: Cardiovascular Family History 1.3.6.1.4.1.19376.1.4.1.5.33 STATIC

Concept / Coding Scheme	SNOMED CT
Family history of coronary artery disease	430091005
Family history: Diabetes mellitus	160303001
Family history of myocardial infarction	266897007
No Family history of Diabetes	160274005
No Family history of Cardiovascular disease	160270001
Family History Unknown	407559004

Adapted from DICOM PS3.16-2009

6.3.6.4 Contrast Agents Classes for Adverse Reactions

The content creator shall be capable of creating a Contrast Agents Classes for Adverse Reactions selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.34, listed below.

Table 6.3.6.4-1: Contrast Agents Classes for Adverse Reactions 1.3.6.1.4.1.19376.1.4.1.5.34 STATIC

Concept / Coding Scheme	SNOMED CT
Iodinated contrast agent	426722004
Gadolinium compound	105879004
Echocardiography agent	409290009
Radiopharmaceutical	349358000

6.3.6.5 Cardiac Lab Results - Vocabulary Constraints

The content creator shall be capable of creating cardiac lab results selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.35, listed below.

Table 6.3.6.5-1: Cardiac Lab Results 1.3.6.1.4.1.19376.1.4.1.5.35 DYNAMIC

Coding Scheme / Concept	LOINC	SNOMED
Cholesterol.in HDL	2085-9	
Cholesterol.in LDL	2089-1	
Cholesterol	2093-3	
Triglyceride	2571-8	
High sensitivity C reactive protein	30522-7	
Creatine kinase.MB	13969-1	1224421017
Natriuretic peptide.B	30934-4	
Natriuretic peptide.B prohormone	33762-6	
Troponin T.cardiac	6598-7	186259011
Troponin I.cardiac	10839-9	
Creatinine	2160-0	489161011
Hemoglobin A1c	41995-2	373201015
Urea nitrogen	3094-0	
Fasting glucose	1557-8	
Platelets	11126-0	488930013
Potassium	11148-4	489169013
Urea Nitrogen	11065-0	489160012
Prothrombin Time		2534465010

6.3.6.6 Vital Sign Result - Value Set

The content creator shall be capable of creating vital signs organizers selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.36, listed below.

Table 6.3.6.6-1: Vital Sign Result 1.3.6.1.4.1.19376.1.4.1.5.36 STATIC

Coding Scheme / Concept	Coding System	Code
Respiratory Rate	LOINC	9279-1
Heart Rate	LOINC	8867-4
O2 % BldC Oximetry	LOINC	2710-2
BP Systolic	LOINC	8480-6
BP Diastolic	LOINC	8462-4

Concept \ Coding Scheme	Coding System	Code
Body Temperature	LOINC	8310-5
Height	LOINC	8302-2
Height (Lying)	LOINC	8306-3
Head Circumference	LOINC	8287-5
Weight Measured	LOINC	3141-9
BMI (Body Mass Index)	LOINC	39156-5
BSA (Body Surface Area)	LOINC	3140-1

6.3.6.7 Procedure Indications - Vocabulary Constraints

The content creator shall be capable of creating procedure indications selected from Value Set
3145 1.3.6.1.4.1.19376.1.4.1.5.37, listed below.

Table 6.3.6.7-1: Procedure Indications 1.3.6.1.4.1.19376.1.4.1.5.37 STATIC

Concept \ Coding Scheme	SNOMED CT
Chest Pain	29857009
Preoperative cardiovascular examination	444733009
Coronary Artery Disease	53741008
Heart failure	84114007
Heart disease risk factors	171224000
Dyspnea	267036007
Post PTCA	373108000
History of CABG	399261000
Abnormal exercise tolerance test	165084003
Abnormal ECG	102594003
Arrhythmia	44808001
Angina pectoris	194828000
Hypertension	38341003
Palpitations	80313002
Supraventricular tachycardia	6456007
Syncope	271594007
History of Myocardial Infarction	399211009
Left bundle branch block	63467002
Valvular heart disease	368009
Occupational requirement	429060002
cardiogenic shock	89138009
ischemic heart disease	414545008

Concept \ Coding Scheme	SNOMED CT
cardiac function test abnormal	165076002
heart transplant	32413006
heart disease - congenital	13213009
Cardiomyopathy	85898001
heart disease	56265001
Perioperative Evaluation	430091005
structural disorder of heart	128599005
Pericardial disease	55855009

6.3.6.8 Result Observations Constraints

The content creator shall be capable of creating result observations selected from the Result Observations Constraints Set `1.3.6.1.4.1.19376.1.4.1.5.38` listed below. These results will apply to procedure findings for lesions and the coronary anatomy.

The Procedure Results – Cardiac section content module records clinically significant observations confirmed or discovered during the procedure or surgery.

For this CRC profile, the findings should be organized using Procedure Results Organizer – Cardiac entry content modules for specific categories (e.g., right heart cath findings, coronary anatomy findings, left heart cath findings, and PCI findings). There shall be a Procedure Results Organizer-Cardiac entry content module for one or more of these categories of findings. The allowed categories are defined in CRC Procedure Findings Types Value Set `1.3.6.1.4.1.19376.1.4.1.5.43`.

Result Observations – Cardiac entry content modules are used to record specific findings (e.g., stenosis, timi flow, lesion characteristics, or wall motion characteristics) in each category. The specific findings should be selected from the Result Observations Constraints Set `1.3.6.1.4.1.19376.1.4.1.5.38`. Note that these findings may apply to lesions and coronary anatomy.

Table 6.3.6.8-1: Result Observation Constraints 1.3.6.1.4.1.19376.1.4.1.5.38 STATIC

Cardinality	Procedure Type Condition	observation/code	Data Type	Unit of Measure	Value Set
[0..1]	R: PCI	"Previously Treated Lesion"	CD	NA	True or False
[0..1]	R: PCI	449389000, "Previously Treated Lesion with Stent"	CD	NA	True or False
[0..1]	R: PCI	251030009,"In-stent Restenosis"	CD	NA	True or False

Cardinality	Procedure Type Condition	observation/code	Data Type	Unit of Measure	Value Set
[0..1]	R: PCI	421327009," In-stent Thrombosis"	CD	NA	True or False
[0..1]	R: PCI	408716009, "Stenotic lesion length"	PQ	cm	Value
[0..1]	R: PCI	421327009," Thrombus Present"	CD	NA	True or False
[0..1]	R: PCI	371894001," Bifurcation Lesion"	CD	NA	True or False
[0..1]	R: PCI & Diagnostic CATH	233970002, pre-procedure Stenosis	PQ	%	
[0..1]	R: PCI	233970002, post-procedure Stenosis	PQ	%	
[0..1]	R: PCI	"Pre-Procedure TIMI Flow"	CD		371867000 (TIMI-0) 371866009 (TIMI-1) 371864007 (TIMI-2) 371865008 (TIMI-3)
[0..1]	R: PCI	"Post-Procedure TIMI Flow"	CD		371867000 (TIMI-0) 371866009 (TIMI-1) 371864007 (TIMI-2) 371865008 (TIMI-3)
[0..1]	R: PCI	70390005," Significant Dissection"	CD	NA	True or False
[0..1]	R: PCI	234010000,"Coronary artery perforation"	CD	NA	True or False
[1..1]	R:Diagnostic Cath	"Coronary Dominance"	CD		253729004 (Left) 253728007 (Right) 253730009 (Balanced)
[0..*]	R:Diagnostic Cath	8583-7, LOINC, "Right atrial A wave amplitude"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8582-9, LOINC, " Left atrial A wave amplitude"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8593-6, LOINC, "Right atrial V wave amplitude"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8592-8, LOINC, "Left atrial V wave amplitude"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8400-4, LOINC, "Right atrial Intrachamber mean pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic	8399-8, LOINC, "Left atrial	PQ	mm[Hg]	

Cardinality	Procedure Type Condition	observation/code	Data Type	Unit of Measure	Value Set
	Cath	Intrachamber mean pressure"			
[0..*]	R:Diagnostic Cath	8432-7, LOINC, "Right ventricular Intrachamber systolic pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8430-1, LOINC," Left ventricular Intrachamber systolic pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8377-4, LOINC," Right ventricular Intrachamber diastolic pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8375-8, LOINC," Left ventricular Intrachamber diastolic pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8392-3, LOINC," Right ventricular End diastolic blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8391-5, LOINC, "Left ventricular End diastolic blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8440-0, LOINC, "Pulmonary Artery Systolic Blood Pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8441-8, LOINC," Pulmonary artery - left Systolic blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8387-3, LOINC, "Pulmonary artery - right Diastolic blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8386-5, LOINC," Pulmonary artery - left Diastolic blood pressure "	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8416-0, LOINC, "Pulmonary artery - right Mean blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8415-2, LOINC, "Pulmonary artery - left Mean blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8584-5, LOINC, “Pulmonary artery wedge A wave amplitude”	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8596-9, LOINC, "Pulmonary artery wedge V wave amplitude"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8587-8, LOINC, "Pulmonary artery wedge Mean blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic	8368-3, LOINC, "Aorta	PQ	mm[Hg]	

Cardinality	Procedure Type Condition	observation/code	Data Type	Unit of Measure	Value Set
	Cath	thoracic ascending Diastolic blood pressure"			
[0..*]	R:Diagnostic Cath	8367-5, LOINC, "Aorta thoracic proximal ascending Diastolic blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8396-4, LOINC, "Aorta.thoracic ascending Mean blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8397-2, LOINC, "Aorta.thoracic proximal ascending Mean blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8423-6, LOINC, "Aorta.thoracic ascending, Systolic blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8422-8, LOINC, "Aorta.thoracic proximal ascending Systolic blood pressure"	PQ	mm[Hg]	
[0..*]	R:Diagnostic Cath	8840-1, LOINC, " Left atrium Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8841-9, LOINC, "Right atrium Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8842-7, LOINC, " High right atrium Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8843-5, LOINC, " Low right atrium Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8844-3, LOINC, " Mid right atrium Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8845-0, LOINC, " Left ventricular Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8847-6, LOINC, " Right ventricular Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8846-8, LOINC, " Right ventricular outflow tract Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8851-8, LOINC, " Pulmonary artery - left Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8852-6, LOINC, " Main pulmonary artery Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8853-4, LOINC, " Pulmonary artery - right Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8854-2, LOINC, " Pulmonary wedge Oxygen saturation"	PQ	%	

Cardinality	Procedure Type Condition	observation/code	Data Type	Unit of Measure	Value Set
[0..*]	R:Diagnostic Cath	8850-0, LOINC, " Inferior vena cava Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath	8855-9, LOINC, " Superior vena cava Oxygen saturation"	PQ	%	
[0..*]	R:Diagnostic Cath where targetSiteCode = “Ao” or “PA”	14775-1, LOINC, " Hemoglobin [Mass/volume] in Arterial blood by Oximetry"	PQ	g/dL	
[0..*]	R:Diagnostic Cath	50188-2, LOINC, " Arterial-venous oxygen saturation difference"	PQ	vol%	
[0..*]	R:Diagnostic Cath	8741-1, LOINC, "Left ventricular Cardiac output"	PQ	L/min	
[0..*]	R:Diagnostic Cath	8736-1, LOINC, "Left ventricular Cardiac output by Fick method"	PQ	L/min	
[0..*]	R:Diagnostic Cath	8733-8, LOINC, " Left ventricular Cardiac output by Angiography single plane"	PQ	L/min	
[0..*]	R:Diagnostic Cath	8732-0, LOINC, "Left ventricular Cardiac output by Angiography biplane"	PQ	L/min	
[0..*]	R:Diagnostic Cath	8750-2, LOINC, " Left ventricular Cardiac index by Fick method"	PQ	L/min/m2	
[0..*]	R:Diagnostic Cath	8747-8, LOINC, "Left ventricular Cardiac index by Angiography single plane"	PQ	L/min/m2	
[0..*]	R:Diagnostic Cath	8746-0, LOINC, "Left ventricular Cardiac index by Angiography biplane"	PQ	L/min/m2	
[0..*]	R:Diagnostic Cath	8743-7, LOINC, "Pulmonary blood flow/Systemic blood flow by Imaging"	PQ	Qp/Qs	
[0..*]	R:Diagnostic Cath	8828-6, LOINC, "Pulmonary vascular Resistance"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8826-0, LOINC, " Pulmonary vascular Resistance by Fick method"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8827-8, LOINC, "Pulmonary vascular Resistance by Indicator dilution"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8831-0, LOINC, ”Systemic vascular Resistance"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8829-4, LOINC, "Systemic vascular Resistance by Fick method"	PQ	dyn.s/cm5	

Cardinality	Procedure Type Condition	observation/code	Data Type	Unit of Measure	Value Set
[0..*]	R:Diagnostic Cath	8830-2, LOINC, "Systemic vascular Resistance by Indicator dilution"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8834-4, LOINC, "Pulmonary vascular Resistance index"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8832-8, LOINC, "Pulmonary vascular Resistance index by Fick method"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8833-6, LOINC, "Pulmonary vascular Resistance index by Indicator dilution"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8837-7, LOINC, "Systemic vascular Resistance index"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8835-1, LOINC, "Systemic vascular Resistance index by Fick method"	PQ	dyn.s/cm5	
[0..*]	R:Diagnostic Cath	8836-9, LOINC, "PV Systemic vascular Resistance index by Indicator dilution"	PQ	dyn.s/cm5	
R [1..1]	R:Diagnostic Cath OR pci	10230-1, LOINC, "Left ventricular Ejection fraction" methodCode= ● 258083009, SNOMED CT, "Visual estimation" ● 258090004, SNOMED CT, "Calculated"	PQ	%	
R [1..1]	Diagnostic Cath - Wall Motion	250929008, SNOMED CT, left ventricular cavity size	CD		1.3.6.1.4.1.19376.1.4.1.5.22 Cardiac Chamber Size Assessments
O [0..1]	Diagnostic Cath - Wall Motion	8823-7, LOINC, left ventricle systolic volume	PQ	ml	
O [0..1]	Diagnostic Cath - Wall Motion	8821-1, LOINC, Left ventricle diastolic volume	PQ	ml	
O [0..1]	Diagnostic Cath - Wall Motion	250964004, SNOMED CT, right ventricular cavity size	CD		1.3.6.1.4.1.19376.1.4.1.5.22 Cardiac Chamber Size Assessments
O [0..1]	Diagnostic Cath - Wall Motion	399121005, SNOMED CT, Left atrium cavity size	CD		1.3.6.1.4.1.19376.1.4.1.5.22 Cardiac Chamber Size Assessments
O[0..1]	Diagnostic Cath - Wall Motion	439749006:363698007=73829009, SNOMED CT, Right atrium volume by imaging	CD		1.3.6.1.4.1.19376.1.4.1.5.22 Cardiac Chamber Size Assessments
O [0..1]	Diagnostic Cath - Wall Motion	18087-7, LOINC, Left Ventricle Mass	CD		260395002, SNOMED CT, "normal" 35105006, SNOMED CT, "Increased"

Cardinality	Procedure Type Condition	observation/code	Data Type	Unit of Measure	Value Set
R[1..1]	Diagnostic Cath - Wall Motion	304522008, SNOMED CT, Pulmonary vein finding	CD		1.3.6.1.4.1.19376.1.4.1.5.23 Pulmonary Veins Assessments
O [0..1]	Diagnostic Cath - Wall Motion	404684003, SNOMED CT, "Finding"	ED (text/plain) or CD		indicate the type of intracardiac mass if present. ● Vegetation ● Thrombus ● Neoplasm ● Mass of Unknown Etiology May use CD with value ● 387842002, SNOMED CT, "neoplasm of heart" ● 309519009, SNOMED CT, "LV Thrombus"
O [0..*]	Diagnostic Cath - Wall Motion	442119001, SNOMED CT, "Cardiac shunt finding"	CD		1.3.6.1.4.1.19376.1.4.1.5.29 Cardiac Shunt Types
R[1..1]	Diagnostic Cath - Wall Motion	301123005, SNOMED CT, "Pericardial finding"	CD		373945007, SNOMED CT, "Pericardial effusion" + size [CARD TF-2: 6.2.2.7.5.1]
O [0..1]	Diagnostic Cath - Wall Motion	301123005, SNOMED CT, "Pericardial finding"	CD		35304003, SNOMED CT, "Tamponade"
O [0..1]	Diagnostic Cath - Wall Motion	301123005, SNOMED CT, "Pericardial finding"	ED text/plain or CD		Indicate the thickness of the pericardium. ● Normal ● Thickened ● Calcified May use CD with value 42653000, SNOMED CT, "Calcified pericardium"
o [1..1]	Diagnostic Cath - Wall Motion	301099004, SNOMED CT, "Aortic valve finding"	CD		301100007, SNOMED CT, "Aortic valve normal" 84683006, SNOMED CT, "Aortic valve prosthesis" 8722008, SNOMED CT, "Aortic valve disorder"
O [0..*]	Diagnostic Cath -	301099004, SNOMED CT,	CD		253612007, SNOMED

Cardinality	Procedure Type Condition	observation/code	Data Type	Unit of Measure	Value Set
	Wall Motion	"Aortic valve finding"			CT, aortic valve cusp prolapse 301184001, SNOMED CT, aortic valve vegetations 13689005, SNOMED CT, congenital anomaly of aortic valve
O [1..1]	Diagnostic Cath - Wall Motion	301099004, SNOMED CT, "Aortic valve finding"	CD		60573004, SNOMED CT, aortic valve stenosis + severity [CARD TF-2: 6.2.2.7.5.2]
O[1..1]	Diagnostic Cath - Wall Motion	301099004, SNOMED CT, "Aortic valve finding"	CD		60234000, SNOMED CT, Aortic regurgitation + severity [CARD TF-2: 6.2.2.7.5.2]
O[1..1]	Diagnostic Cath - Wall Motion	301101006, SNOMED CT, "Mitral valve finding"	CD		301103009, SNOMED CT, "Mitral valve normal" 11851006, SNOMED CT, "Mitral valve disorder" 17107009, SNOMED CT, "Mitral valve prosthesis" 360063009, SNOMED CT, "Annuloplasty ring"
O [0..*]	Diagnostic Cath - Wall Motion	301101006, SNOMED CT, "Mitral valve finding"	CD		409712001, SNOMED CT, Mitral valve prolapse 270906004, SNOMED CT, mitral chordae rupture 301185000, SNOMED CT, Mitral valve vegetations 75372006, SNOMED CT, congenital anomaly of Mitral valve
O [1..1]	Diagnostic Cath - Wall Motion	301101006, SNOMED CT, "Mitral valve finding"	CD		251002009, SNOMED CT, mitral valve annular calcification
O [1..1]	Diagnostic Cath - Wall Motion	301101006, SNOMED CT, "Mitral valve finding"	CD		79619009, SNOMED CT, Mitral valve

Cardinality	Procedure Type Condition	observation/code	Data Type	Unit of Measure	Value Set
					stenosis + severity [CARD TF-2: 6.2.2.7.5.2]
O [1..1]	Diagnostic Cath - Wall Motion	301101006, SNOMED CT, "Mitral valve finding"	CD		48724000, SNOMED CT, Mitral regurgitation + severity [CARD TF-2: 6.2.2.7.5.2]
O [0..1]	Diagnostic Cath - Wall Motion	301104003, SNOMED CT, "Pulmonic valve finding"	CD		91434003, SNOMED CT, Pulmonic regurgitation + severity [CARD TF-2: 6.2.2.7.5.2]
O [1..1]	Diagnostic Cath - Wall Motion	404684003, SNOMED CT, "Finding" + targetSiteCode [CARD TF-2: 6.2.2.7.5.3]	CD		308546005, SNOMED CT, "Dissection of aorta"
O [1..1]	Diagnostic Cath - Wall Motion	404684003, SNOMED CT, "Finding"	CD		251036003, SNOMED CT, "Aortic root dilation"
C [1..1]	R: Diagnostic Cath	113730, DCM, "Total Fluoro Time"	PQ	s	
O[0..*]		2576595010, SNOMED CT, "Finding" + targetSiteCode [CARD TF-2: 6.2.2.7.5.3]	CD		2576595010, SNOMED CT, "Bruits – femoral" 2576593015, SNOMED CT, "Bruits – carotid"

6.3.6.9 Contrast Agents - Vocabulary Constraints

3170 The content creator shall be capable of creating Contrast Agents selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.39, listed below.

Table 6.3.6.9-1: Contrast Agents 1.3.6.1.4.1.19376.1.4.1.5.39 STATIC

Coding Scheme / Concept	SNOMED CT	NDC
Radionuclide: F-18 FDG for viability	422975006	
Radionuclide: Rubidium-82 perfusion	79197006	
Radionuclide: Nitrogen-13 ammonia perfusion	21576001	
Radionuclide: Tc-99m tetrofosmin (Myoview)	404707004	
Radionuclide: Tc-99m sestamibi (Cardiolite)	404706008	
Radionuclide: Tl-201	353842007	
Echo Contrast: Optison (Perflutren)	409291008	00019-2707-03

Concept \ Coding Scheme	SNOMED CT	NDC
Echo Contrast: Definity (Perflutren Lipid Microsphere)		11994-*011-04
Echo Contrast: Agitated saline	373757009	
Echo Contrast: Iodinated contrast	426722004	
High Osmolar Ionic Contrast: Diatrizoate meglumine and diatrizoate sodium (Renografin, etc.)	416688007	
High Osmolar Ionic Contrast: Iothalamate dimeglumine (Conray)	109221002	
Low osmolar non-ionic contrast: Iopamidol (Isovue)	109219007	
Low osmolar non-ionic contrast: Iohexol (Omnipaque)	109218004	
Low osmolar non-ionic contrast: Ioversol (Optiray)	109222009	
Low osmolar non-ionic contrast: Ioxaglate (Hexabrix)	353924001	
Low osmolar non-ionic contrast: Iomeprol (Iomeron)	356671000	
Low osmolar non-ionic contrast: Iopromide (Ultravist)	353903006	
Iso-osmolar nonionic contrast: Iodixanol (VisiPaque)	353962003	
Paramagnetic agent: Gadopentetate dimeglumine (Magnevist)	404846007	
Paramagnetic agent: Gadodiamide (Omniscan)	354088005	
Paramagnetic agent: Gadoversetamide (Optimark)	409477004	
Paramagnetic agent: Gadobenate dimeglumine (MultiHance)	414307008	

6.3.6.10 Cardiac Activity Procedures - Vocabulary Constraints

3175 The content creator shall be capable of creating Cardiac Activity Procedures selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.40, listed below.

Table 6.3.6.10-1: Cardiac Activity Procedures 1.3.6.1.4.1.19376.1.4.1.5.40 STATIC

Concept \ Coding Scheme	SNOMED CT
PCI	415070008
IABP	28718015
Endomyocardial Biopsy	1481899014
Right Heart Cath	67358018
Fick Cardiac Output	53921011
Other Mechanical Ventricular Support: LVAD	349042010
Other Mechanical Ventricular Support: CPB	105872012
Other Mechanical Ventricular Support: ECMO	349972019
Diagnostic Coronary Angiography	1234097013
Left Heart Cath Procedure	500786010
Intravascular Ultrasound	241466007

6.3.6.11 Drug Classes and Specific Cardiac Drugs - Vocabulary Constraints

3180 The content creator shall be capable of creating cardiac procedure Drug Classes and Specific Cardiac Drugs selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.41, listed below.

Table 6.3.6.11-1: Drug Classes and Specific Cardiac Drugs 1.3.6.1.4.1.19376.1.4.1.5.41 STATIC

Coding Scheme / Concept	SNOMED CT	NDF-RT (DRUG CLASSES)	RxNorm
ACE inhibitor	69306018	N0000029130	836
Angiotensin receptor blocker	96308008	N0000175561	133049
Thyroid replacement		N0000029627	691804
Aspirin, other antiplatelet agents	7947003	N0000145918	1191
Calcium channel blockers	48698004	N0000029119	1899
Beta-blockers	33252009	N0000029118	691779
Erectile dysfunction medication: sildenafil		N0000022115	136411
Erectile dysfunction medication: tadalafil		N0000148829	358263
Nitrates	31970009	N0000007647	7439
Antiarrhythmics	67507000	N0000029121	883
Antiarrhythmics: Potassium Channel Antagonist	415151000		
Antiarrhythmics: Amiodarone		N0000005761	703
Antiarrhythmics: Propafenone		N0000006692	8754
Antiarrhythmics: Flecainide		N0000147848	4441
Antiarrhythmics: Dofetilide		N0000148648	49247
Antiarrhythmics: Sotalol		N0000148334	9947
Antiarrhythmics: Disopyramide		N0000005784	3541
Antiarrhythmics: Dronedarone		N0000179804	233698
Antiarrhythmics: Quinidine		N0000148010	9068
Antiarrhythmics: Procainamide		N0000147989	8700
Digitalis	65774009	N0000147198	91235
Digitalis: Digoxin		N0000146388	3407
Metformin	109081006	N0000021984	6809
Lipid-lowering medication	57952007	N0000029122	969
Other antihypertensives		N0000029427	714568
Xanthines		N0000008118	11357
Xanthines: Aminophylline	55867006	N0000146397	689
Xanthines: Theophylline	66493003	N0000146467	10438
Dipyridamole	66859009	N0000146237	3521
Inhaler		N0000177906	992544
Diabetic medications	384953001		

Concept \ Coding Scheme	SNOMED CT	NDF-RT (DRUG CLASSES)	RxNorm
Lidocaine		N0000006071	6387
Diphenhydramine		N0000006794	3498
Hydromorphone		N0000005957	3423
Midazolam		N0000006704	6960
Normal Saline			125464
Isovue			Isovue 370 155031 Isovue-M-200 217822 Isovue-M-300 262238
Anticoagulants: Fondaparinux		N0000148733	321208
Anticoagulants: Low Molecular Weight Heparin		N0000007961	5227
Anticoagulants: Unfractionated Heparin		N0000175474	1036221
Anticoagulants: Warfarin	48603004	N0000148057	11289
Direct Thrombin Inhibitors: Bivalirudin		N0000010076	60819
Glycoprotein IIb/IIIa Inhibitors		N0000009962	986894
Thienopyridines		N0000182125	1031667
Thienopyridines: Clopidogrel		N0000022101	32968
Thienopyridines: Ticlopidine		N0000006471	10594
Thienopyridines: Prasugrel		N0000179815	613391
Thienopyridines: Ticagrelor			1116632

3185

6.3.6.12 Rx Recommendation - Vocabulary Constraints

The content creator shall be capable of creating an Rx recommendation selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.42, listed below.

3190 **Table 6.3.6.12-1: Rx Recommendation 1.3.6.1.4.1.19376.1.4.1.5.42 STATIC**

Concept \ Coding Scheme	SNOMED CT
Medical therapy	243121000
Counseling about disease	445142003
percutaneous coronary intervention (implicitly without planned CABG, unless there is a separate plan of care item for CABG)	415070008
coronary artery bypass graft	232717009

Concept \ Coding Scheme	SNOMED CT
cardiac rehabilitation	313395003

6.3.6.13 CRC Procedure Findings Types - Vocabulary Constraints

The content creator shall be capable of creating CRC Procedure Findings Types selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.43, listed below.

Table 6.3.6.13-1: CRC Procedure Findings Types 1.3.6.1.4.1.19376.1.4.1.5.43 STATIC

Concept \ Coding Scheme	SNOMED CT
PCI	415070008
IABP	28718015
Endomyocardial Biopsy	1481899014
Right Heart Cath	67358018
Fick Cardiac Output	53921011
Other Mechanical Ventricular Support: LVAD	349042010
Other Mechanical Ventricular Support: CPB	105872012
Other Mechanical Ventricular Support: ECMO	349972019
Diagnostic Coronary Angiography	1234097013
Left Heart Cath Procedure	500786010
Intravascular Ultrasound	241466007

6.3.6.14 CRC Postprocedure Diagnoses - Vocabulary Constraints

The content creator shall be capable of creating CRC Postprocedure Diagnoses selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.44, listed below.

Table 6.3.6.14-1: CRC Postprocedure Diagnoses 1.3.6.1.4.1.19376.1.4.1.5.44 STATIC

Concept \ Coding Scheme	SNOMED CT
Chest Pain	29857009
Pre-operative	262068006
Coronary Artery Disease	53741008
Heart failure	84114007
Heart disease risk factors	171224000
Dyspnea	267036007
Post PTCA	373108000

Concept \ Coding Scheme	SNOMED CT
History of CABG	399261000
Abnormal exercise tolerance test	165084003
Abnormal ECG	102594003
Arrhythmia	44808001
Angina pectoris	194828000
Hypertension	38341003
Palpitations	80313002
Supraventricular tachycardia	6456007
Syncope	271594007
History of Myocardial Infarction	399211009
Left bundle branch block	63467002
Valvular heart disease	368009
Occupational requirement	429060002
cardiogenic shock	89138009
ischemic heart disease	414545008
cardiac function test abnormal	165076002
heart transplant	32413006
heart disease - congenital	13213009
Cardiomyopathy	85898001
heart disease	56265001
Perioperative Evaluation	430091005
structural disorder of heart	128599005
Pericardial disease	55855009

6.3.6.15 Supported File Formats - Vocabulary Constraints

The content creator shall be capable of creating Supported File Formats selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.45, listed below.

3205

Table 6.3.6.15-1: Supported File Formats 1.3.6.1.4.1.19376.1.4.1.5.45 STATIC

Value Set: SupportedFileFormats 1.3.6.1.4.1.19376.1.4.1.5.45 STATIC	
Graphic Formats	**Code**
GIF Image	image/gif
TIF Image	image/tiff
JPEG Image	image/jpeg
PNG Image	image/png

6.3.6.16 Complications - Vocabulary Constraints

The content creator shall be capable of creating a complication selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.46, listed below.

3210

Table 6.3.6.16-1: Complications 1.3.6.1.4.1.19376.1.4.1.5.46 STATIC

Coding Scheme / Concept	NCDR CathPCI Seq #	SNOMED CT
Myocardial Infarction (Biomarker Positive)	8000	22298006
Cardiogenic Shock	8005	89138009
Heart Failure	8101	84114007
CVA/Stroke	8015	230690007
Hemorrhagic Stroke	8021	230706003
Cardiac Tamponade	8025	35304003
Renal Failure	8030	42399005
Other vascular complications requiring treatment	8035	213217008
Anemia due to blood loss	8040	413532003
Bleeding event	8050	131148009
Bleeding at access site	8055	110265006
Hematoma at access site	8060	213262007
Retroperitoneal bleeding	8070	308898001
Gastrointestinal bleeding	8080	74474003
Genital-urinary bleeding	8090	417941003
Other bleeding	8100	131148009
Death in lab	9055	419099009

6.3.6.17 Anginal Class - Vocabulary Constraints

The content creator shall be capable of picking one angina class selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.47, listed below.

3215

Table 6.3.6.17-1: Anginal Class 1.3.6.1.4.1.19376.1.4.1.5.47 STATIC

Coding Scheme / Concept	SNOMED CT
Anginal Class: 1	61490001
Anginal Class: 2	41334000
Anginal Class: 3	85284003

Concept \ Coding Scheme	SNOMED CT
Anginal Class: 4	89323001

6.3.6.18 New York Heart Class - Vocabulary Constraints

The content creator shall be capable of picking one New York Heart class selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.48, listed below.

3220

Table 6.3.6.18-1: New York Heart Class 1.3.6.1.4.1.19376.1.4.1.5.48 STATIC

Concept \ Coding Scheme	SNOMED CT
NYHA Class 1	420300004
NYHA Class 2	421704003
NYHA Class 3	420913000
NYHA Class 4	422293003

6.3.6.19 DICOM CID 3718 - Myocardial Wall Segments in Projection - Vocabulary Constraints

The content creator shall be capable of picking Myocardial Wall Segments in Projection selected
3225 from Value Set 1.2.840.10008.6.1.219, listed below.

Table 6.3.6.19-1: Myocardial Wall Segments in Projection 1.2.840.10008.6.1.219 STATIC

Concept \ Coding Scheme	SNOMED CT
left ventricle basal anterior segment	264850008
myocardium of anterolateral region	73050001
myocardium of apex of heart	47962008
myocardium of diaphragmatic region	72542009
left ventricle basal inferior segment	264846001
left ventricle basal lateral segment	277631004
myocardium of posterolateral region	33272004
myocardium of inferolateral region	16239001
left ventricle apical septal segment	264845002
left ventricular basal septal segment	277630003
left ventricular posterobasal segment	408720008

Copied from DICOM PS3.16

6.3.6.20 Cardiac Chamber Size Assessments -1.3.6.1.4.1.19376.1.4.1.5.22 DICOM - Vocabulary Constraints

The content creator shall be capable of picking Cardiac Chamber Size Assessments in Projection selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.22, listed below.

Table 6.3.6.20-1: Cardiac Chamber Size Assessments 1.3.6.1.4.1.19376.1.4.1.5.22 STATIC

Concept \ Coding Scheme	SNOMED CT
normal size cardiac chamber	373124004
abnormally small cardiac chamber	373125003
mildly enlarged cardiac chamber	373126002
moderately enlarged cardiac chamber	373127006
markedly enlarged cardiac chamber	373128001

Copied from IHE Card – CIRC profile supplement (Section 6.3)

6.3.6.21 Pulmonary Veins Assessments - 1.3.6.1.4.1.19376.1.4.1.5.23 DICOM - Vocabulary Constraints

The content creator shall be capable of picking Pulmonary Veins Assessments selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.23, listed below.

Table 6.3.6.21-1: Pulmonary Veins Assessments 1.3.6.1.4.1.19376.1.4.1.5.23 STATIC

Concept \ Coding Scheme	SNOMED CT
pulmonary venous connections normal	446158009
variant number of pulmonary veins (usually 3 or 5), but with normal pulmonary venous drainage into left atrium	
anomalous pulmonary venous drainage	59631007

Copied from IHE Card – CIRC profile supplement (Section 6.3)

6.3.6.22 Cardiac Shunt Types -1.3.6.1.4.1.19376.1.4.1.5.29 DICOM - Vocabulary Constraints

The content creator shall be capable of picking Cardiac Shunt Types selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.29, listed below.

Table 6.3.6.22-1: Cardiac Shunt Types 1.3.6.1.4.1.19376.1.4.1.5.29 STATIC

Concept \ Coding Scheme	SNOMED CT
patent foramen ovale	204317008

Concept \ Coding Scheme	SNOMED CT
atrial septal defect	70142008
ventricular septal defect	30288003
patent ductus arteriosus	83330001

Copied from IHE Card – CIRC profile supplement (Section 6.3)

6.3.6.23 Angina Type -1.3.6.1.4.1.19376.1.4.1.5.7 DICOM - Vocabulary Constraints

The content creator shall be capable of picking AnginaType selected from Value Set 1.3.6.1.4.1.19376.1.4.1.5.7, listed below.

Table 6.3.6.24-1: Angina Type 1.3.6.1.4.1.19376.1.4.1.5.7

Concept \ STATICCoding Scheme	SNOMED CT
Stable angina	233819005
Unstable angina	4557003
Atypical chest pain	371807002
Myocardial infarction	22298006

Copied from IHE Card – CIRC profile supplement (Section 6.3)

Namespace Additions

Add the following terms to the IHE Namespace:

Level (e.g., Section/Document/Entry)	Template id	Name
Document template id	1.3.6.1.4.1.19376.1.4.1.**1.2**	Cath Report Content (CRC)
Section template id	1.3.6.1.4.1.19376.1.4.1.**2.16**	Document Summary
Section template id	1.3.6.1.4.1.19376.1.4.1.**2.17**	Medical History - Cardiac
Section template id	1.3.6.1.4.1.19376.1.4.1.**2.19**	Procedure Description - Cardiac
Section template id	1.3.6.1.4.1.19376.1.4.1.**2.20**	Procedure Results - Cardiac
Section template id	1.3.6.1.4.1.19376.1.4.1.**2.21**	Key Images - Cardiac
Section template id	1.3.6.1.4.1.19376.1.4.1.**2.22**	Plan of Care - Cardiac
Section template id	1.3.6.1.4.1.19376.1.4.1.**2.23**	Pre-Procedure Results – Cardiac
Entry template id	1.3.6.1.4.1.19376.1.4.1.**4.9**	Problem Observation – Cardiac
Entry template id	1.3.6.1.4.1.19376.1.4.1.**4.10**	Lesion Observation
Entry template id	1.3.6.1.4.1.19376.1.4.1.**4.11**	Result Organizer – Cardiac
Entry template id	1.3.6.1.4.1.19376.1.4.1.**4.12**	Procedure Device Organizer – Cardiac
Entry template id	1.3.6.1.4.1.19376.1.4.1.**4.13**	Device Observation

Level (e.g., Section/Document/Entry)	Template id	Name
Entry template id	1.3.6.1.4.1.19376.1.4.1.**4.14**	Procedure Activity Procedure - Cardiac
Entry template id	1.3.6.1.4.1.19376.1.4.1.**4.15**	Procedure Results Organizer - Cardiac
Entry template id	1.3.6.1.4.1.19376.1.4.1.**4.16**	Result Observation – Cardiac
Entry template id	1.3.6.1.4.1.19376.1.4.1.**4.17**	Plan of Care Activity Act – Cardiac
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.31**	Cardiac Problems / Concerns
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.32**	Body Site
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.33**	Cardiovascular Family History
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.34**	Contrast Agent Classes for Adverse Reactions
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.35**	Cardiac Lab Results
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.36**	Vital Sign Result
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.37**	Procedure Indications
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.38**	Result Observations
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.39**	Contrast Agents
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.40**	Cardiac Activity Procedures
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.41**	Drug Classes and Specific Cardiac Drugs
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.42**	Rx Recommendations
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.43**	CRC Procedure Finding Types
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.44**	CRC Postprocedure Diagnoses
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.45**	Supported File Types
Vocabulary/value set id	1.3.6.1.4.1.19376.1.4.1.**5.46**	Complications

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Volume 4 – National Extensions

Add appropriate Country section

4.I National Extensions for <Country Name or IHE Organization>

NA